

***"Do you want to get naked or do you want a cup of tea?"***

**Smartphone geosocial networking apps and the health of  
lesbian, gay and bisexual users in the UK and USA**

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## Abstract

**Background:** Globally lesbian, gay and bisexual (LGB) persons experience physical and mental health inequalities, with men who have sex with men (MSM) at particular risk of sexual ill-health. Introduced in 2009, smartphone geosocial networking applications (GSN apps, e.g. Grindr, Tinder) have become a common way for LGB people to meet sexual and romantic partners. Early evidence suggested GSN apps were associated with negative sexual health outcomes and discrimination for MSM in the USA, China and Australia. Little research has investigated their use in the UK or by women who have sex with women (WSW).

**Aim:** To explore GSN app use by LGB people in UK and USA; including patterns of app use, perceived impacts on health, factors influencing behaviour, risk management by users, and differences between countries or genders.

**Methodology:** A two stage, cross-cultural mixed methods approach with GSN app users in Merseyside (MS; UK) and Connecticut (CT; USA). Stage One: An exploratory, cross-sectional online survey investigated patterns of GSN app use in those looking for same-gender partners (n=207; 64% MS, 36% CT; 41% women, 52% men, 7% non-binary/other/no gender). Stage 2: 33 semi-structured interviews (CT: n=8 women, 8 men, 1 non-binary. MS: n=7 women, 8 men, 1 non-binary) used photo-elicitation (mock-up GSN app profiles) to investigate perceived health impacts, influences on app use and risk management on apps. Thematic analysis of interviews was followed by triangulation in relation to the research objectives.

**Findings:** Men in CT used GSN apps in very similar ways to men in MS, and women in CT were very similar to women in MS. However, men were more sex-focused than women (e.g. looking for casual sex and reporting higher numbers of sexual partners) and experienced more discrimination, harassment and body shaming. Although traditionally associated with “hook-ups”, for all genders sex was only one factor; friendship, romance, community, entertainment and mental health benefits were also important. However, participants reported fear of violence and deception, and negative impacts on their mental health. Users sought to balance risks and benefits of using GSN apps; for most the positives outweighed the negatives. Within the socio-ecological model of health, influences on behaviour varied from the individual to community level, affected by social norms and the functionality of different apps. Participants of all genders used strategies to reduce risk and protect their health on GSN apps. MSM reported widespread sexual health harm reduction strategies, whereas WSW had little concern for sexual health. Bisexual women were particularly cautious of male app users.

**Conclusions:** Findings were very similar in CT and MS suggesting the North American evidence may be applicable in the UK. Health organisations should expand app-based health promotion and outreach that builds on users’ existing harm reduction strategies. Although GSN app companies need to do more to tackle discrimination on apps, apps show a promising opportunity for health improvement and reducing health inequalities.

## Table of Contents

<b>Abstract.....</b>	<b>1</b>
Table of Contents.....	2
List of Figures.....	5
List of Tables.....	6
List of Reflection Boxes.....	7
List of Presentations.....	7
Glossary of terms.....	8
Acknowledgements.....	10
<b>Chapter One   Introduction.....</b>	<b>11</b>
1.1 Introduction.....	11
1.2 Research question and objectives.....	11
1.3 Rationale.....	12
1.4 Research context.....	15
1.4.1 Population in Connecticut and Merseyside.....	17
1.4.2 Health services in Connecticut and Merseyside.....	17
1.5 Research approach.....	18
1.6 Contribution to knowledge.....	19
1.7 Researcher position.....	20
1.8 Overview of thesis.....	20
<b>Chapter Two   Literature Review.....</b>	<b>22</b>
2.1 Introduction.....	22
2.2 Language and definitions.....	22
2.2.1 Homophobia, heterosexism and heteronormativity.....	22
2.2.2 Dimensions of sexual orientation.....	23
2.2.3 Technological terms.....	24
2.3 Theoretical approach.....	25
2.3.1 Stress and LGBTQ+ health inequalities.....	25
2.3.2 Social and cultural influences on health.....	26
2.3.3 Sex positive research.....	30
2.4 Literature review strategy.....	30
2.4.1 Search strategy - general LGBTQ+ literature.....	30
2.4.2 Search strategy - GSN apps and LGB health.....	31
2.5 Health inequalities and sexual orientation.....	32
2.5.1 Mental wellbeing.....	32
2.5.2 Sexual health.....	33
2.5.3 Substance use.....	36
2.5.4 Personal safety and violence.....	37
2.6 Factors protective to health.....	37
2.6.1 Social support, coping and resilience.....	37
2.6.2 Pre-exposure prophylaxis (PrEP).....	38
2.7 Background to lesbian, gay and bisexual dating/sex-seeking.....	39
2.7.1 Internet dating and health.....	39
2.7.2 Development of GSN apps for lesbians, gays and bisexuals.....	41
2.8 Geosocial networking apps and health.....	43
2.8.1 Women who have sex with women, GSN apps and health.....	43
2.8.2 Men who have sex with men, GSN apps and health.....	44
2.8.3 GSN apps and health interventions.....	54
2.9 Conceptual framework.....	56
2.10 Gaps in the literature.....	57
<b>Chapter Three   General Methodology.....</b>	<b>59</b>
3.1 Philosophical approaches to research.....	59
3.1.1 Paradigms.....	59
3.1.2 Pragmatism.....	59
3.2 Mixed methods research.....	61

3.2.1 Why mixed methods research?	61
3.2.2 Design of this mixed methods research	61
3.2.3 Integrating two research methods	63
3.3 Population of interest	64
3.3.1 Labels and fluidity	64
3.3.1 Targeting the research	65
3.3.3 Identity labels and public health research	66
3.4 Ethical considerations	68
3.4.1 Study one (online survey)	68
3.4.2 Study two (interviews)	68
3.4.3 Southern Connecticut State University ethics procedure	71
<b>Chapter Four   Online Survey Methodology (Study 1)</b>	<b>72</b>
4.1 Survey research	72
4.2 Survey tool	73
4.2.1 Questionnaire development	73
4.2.2 Challenges with the questionnaire	74
4.2.3 Piloting and pre-testing	78
4.2.4 Ensuring validity and reliability	79
4.3 Sampling and recruitment	80
4.3.1 Initial sampling method – stratified sampling	81
4.3.2 Second phase sampling – purposive sampling	81
4.3.3 Recruitment methods	81
4.4 Data analysis	87
<b>Chapter Five   Survey Findings and Discussion (Study 1)</b>	<b>90</b>
5.1 Survey participation	90
5.2 Demographic characteristics	90
5.3 Which are the most popular GSN apps?	94
5.3.1 Apps used by socio-demographic characteristics	95
5.3.2 Apps used by behavioural and health characteristics	96
5.3.3 Number of apps used	98
5.4 Why do people use GSN apps?	99
5.4.1 All reasons participants use GSN apps	99
5.4.2 Main reason for using GSN apps	101
5.4.3 Using different apps to find serious relationships or casual partners	102
5.5 What factors influence frequency of app use?	103
5.5.1 Frequency of app use by demographic characteristics	104
5.5.2 Frequency of app use by behavioural characteristics	105
5.6 What factors are associated with using apps to meet opposite-gender partners?	108
5.7 What factors are associated with number of sexual partners?	110
5.7.1 Number of sexual partners by demographic factors	110
5.7.2 Number of sexual partners by health and behavioural characteristics	112
5.8. Are apps changing behaviour?	114
5.8.1 Differences in app partners by demographic characteristics	114
5.8.2 Differences in app partners by behavioural characteristics	115
5.8.3 Demographic and behavioural factors associated with having more sexual partners now they use apps	117
5.8.4 Other ways of meeting partners	119
5.9 Participant views of the positives, risks and negative experiences of using GSN apps	119
5.10 Discussion	122
5.10.1 Differences between the apps	122
5.10.2 Reasons for using GSN apps	124
5.10.3 Participants meeting different types of partners on apps	125
5.10.4 Intensity of app use and risky behaviour	126
5.10.5 Bisexual and plurisexual app users	127
5.10.6 Peers and social norms	128
5.10.7 Health benefits and risks of using GSN apps	129



5.10.8 Limitations .....	129
5.11 Summary of survey findings.....	130
<b>Chapter Six   Qualitative Interviews Methodology (Study 2).....</b>	<b>132</b>
6.1 Refining the focus of study two.....	132
6.2 Qualitative approach .....	132
6.3 Interview procedure.....	134
6.3.1 Interview guide .....	134
6.3.2 Mock-up GSN app profiles .....	135
6.4 Piloting .....	141
6.5 Ensuring quality and rigour.....	141
6.6 Sampling & recruitment.....	144
6.6.1 Sampling approach.....	145
6.6.2 Recruitment methods .....	146
6.7 Data analysis.....	147
6.7.1 Analysis software .....	147
6.7.2 Thematic analysis.....	148
<b>Chapter Seven   Interview Findings and Discussion (Study 2).....</b>	<b>151</b>
7.2 Participants .....	151
7.2.1 Participant demographics .....	152
7.2.2 Participant identities and “outness” .....	154
7.3 Key themes from the interviews.....	155
7.3.1 Theme 1: Patterns of GSN app use .....	156
7.3.2 Theme 2: Influences on GSN app use .....	162
7.3.3 Theme 3: Positive health impacts and benefits of using GSN apps .....	169
7.3.4 Theme 4: Negative impacts and risks of GSN apps .....	174
7.3.5 Theme 5: Strategies for staying happy and healthy .....	181
7.3.6 Theme 6: Sexual health .....	186
7.4 Discussion.....	194
7.4.1 Differences between groups .....	194
7.4.2 Benefits of GSN app use and reasons for use.....	196
7.4.3 Negative health impacts and risks to health .....	197
7.4.4 Balancing risks and benefits .....	199
7.4.5 Influences on how people use GSN apps .....	200
7.4.6 Strategies to reduce risk and maximise benefits .....	203
7.4.7 Limitations.....	205
<b>Chapter Eight   Triangulation and Integration of Findings.....</b>	<b>207</b>
8.1 Introduction .....	207
8.2 Research context – plurisexual and non-binary identities.....	207
8.3 Triangulation.....	207
8.3.1 Understand patterns and motivations for using GSN apps by people seeking same-gender relationships/sexual partners in Merseyside and Connecticut. (Objective 1).....	208
8.3.2 Investigate how people in Merseyside and Connecticut who use GSN apps view the benefits of apps and any potential health risks (Objective 2) .....	211
8.3.3 Explore what influences how people behave whilst seeking sexual/romantic partners on GSN apps (Objective 3).....	217
8.3.4 Explore what, if any, strategies app users may employ to maximise positive outcomes, ensure their safety and reduce risk to health (Objective 4) .....	221
<b>Chapter Nine   Conclusions .....</b>	<b>226</b>
9.1 Revisiting the research objectives.....	226
9.2 Limitations .....	228
9.3 Recommendations .....	230
9.3.1 Health practitioners and public health organisations .....	231
9.3.2 GSN app companies and developers.....	231
9.3.3 Users of GSN apps.....	232
9.3.4 Recommendations for further research.....	233

9.4 GSN apps, LGBTQ+ health and coronavirus .....	234
9.5 Final conclusion .....	235
<b>References .....</b>	<b>238</b>
<b>Appendices .....</b>	<b>270</b>
Appendix A: Overview of each app.....	271
Appendix B: Introduction to Facebook advertising .....	273
Appendix C: Defining sex between two women .....	279
Appendix D: Additional recruitment info .....	280
Appendix E: Additional tables from Chapter 5 (survey analysis) .....	281
Appendix F: Interview consent form.....	283
Appendix G: Interview participant information sheet.....	284
Appendix H: Interview discussion guide.....	288
Appendix I: Thematic analysis coding table .....	292
Appendix J: Outness Inventory (Mohr and Fassinger, 2000) .....	294
Appendix K: Literature review search criteria .....	297
Appendix L: Papers examining GSN apps and health in LGB populations, included in literature review ....	298
Appendix M: Questionnaire (including participant information sheet) .....	303

## List of Figures

Figure 1.1: Relationship between the five research objectives.....	12
Figure 1.2: Merseyside (UK) and Connecticut (USA) .....	15
Figure 1.3: Design of this research study .....	18
Figure 2.1: The overlap between same-sex sexual attraction (ever), LGB sexual identity and same-sex sex within the past 5 years for men and women Data from NATSAL-3 (Geary et al., 2018) .....	24
Figure 2.2: The socio-ecological model of health (adapted from McLeroy et al., 1988) .....	28
Figure 2.3: Grindr user's home screen, displaying users in distance of proximity (Grindr, 2017) .....	42
Figure 2.4: Introduction to the Grindr Holistic Security Guide (Grindr for Equality, 2019) .....	53
Figure 2.5: Conceptual framework for this thesis, highlighting key findings and gaps in literature (research objective number).....	56
Figure 3.1: Design of this research study .....	62
Figure 4.1: Overview of sampling and recruitment methods for survey (inc. final no. of eligible surveys) .....	80
Figure 4.2: Example JPEG advert for survey shared by community organisations on social media.....	86
Figure 5.1: Sexual orientation by sexual partners in the last 12 months (n, %).....	93
Figure 5.2: Sexual orientation by sexual attraction (n, %) .....	93
Figure 5.3: Any reason participants use GSN apps, number ticking each statement combination; women (n=84) and men (n=105) (produced using Heberle et al., 2015) .....	100
Figure 5.4: Correlations between times logging on per day and sexual partners in previous 12 months, only men (with trendline).....	106
Figure 5.5: Correlations between minutes spent on apps per day and sexual partners in previous 12 months, only men (with trendline) .....	107
Figure 5.6: Correlations between times messages sent on apps per day and sexual partners in previous 12 months only men (with trendline).....	107
Figure 6.1: Women's mock profiles 1 and 2 .....	137
Figure 6.2: Women's mock profiles 3 and 4 .....	138
Figure 6.3: Men's mock profiles 1 and 2 .....	139
Figure 6.4: Men's mock profiles 3 and 4 .....	140
Figure 7.1: Theme map - key themes .....	155
Figure 7.2: Theme map - using apps themes, and sub-themes .....	156
Figure 7.3: Reasons for using GSN apps, past and current – men (n=16) and non-binary Grindr user (n=1) .....	158
Figure 7.4: Reasons for using GSN apps, past and current – women (n=15) and non-binary participant who dates women (n=1) .....	159
Figure 7.5: Theme map - managing health on apps themes, and sub-themes .....	170
Figure 9.2: Conceptual framework including key findings from this thesis (research objective numbers) .....	226
Box B1: Facebook targeted "interests" .....	275

Table D1: Study 1 information shared on Facebook groups and pages of community organisations.....	280
Table D2: Other channels sharing the recruitment materials .....	280

## List of Tables

Table 1.1: Population statistics, Merseyside and Connecticut.....	17
Table 3.1: Stages of triangulation protocol (adapted from Farmer et al., 2006) .....	64
Table 4.1: Measures on the questionnaire with ex-ante output harmonisation .....	78
Table 4.2: Demographic characteristics of participants recruited through commercial Facebook advertising and community recruitment (n, %). .....	87
Table 5.1: Socio-demographic characteristics of survey respondents, by area, n (%) .....	91
Table 5.2: Social and health behavioural characteristics of survey respondents, by area, n (%) .....	92
Table 5.3: How apps were used by survey respondents, by area, n (valid %).....	94
Table 5.4: Number of women who have ever used each app, n (%).....	95
Table 5.5: Number of men who have ever used each app, n (%).....	95
Table 5.6: Participants who have ever had a profile on each app, by sexual orientation, n (% of each characteristic who have used each app).....	96
Table 5.7: Median age of users and non-users of each app, Mdn (IRQ) .....	96
Table 5.8: Number of participants who have ever had a profile on each app, by behavioural characteristics, n (% of each characteristic who have used each app).....	97
Table 5.9: Median number of sexual partners in previous 12 months, by use of top five apps.....	97
Table 5.10: Multivariate, binary logistic regression of factors predicting numbers of apps used .....	99
Table 5.11: All reasons for using GSN apps, n indicating yes to each statement (% of gender).....	100
Table 5.12: Main reason for using apps by key participant demographic characteristics, n (%) .....	101
Table 5.13: Mean outness score by main reason for using apps, compared using Kruskal-Wallis tests .....	102
Table 5.14: Four most popular apps when looking for a serious relationship or boyfriend/girlfriend, by area and gender, n (% of those who answered).....	102
Table 5.15: Four most popular apps when looking for casual sex/hook-up by area and gender, n (% of those who answered).....	103
Table 5.16: Correlations between three measures of app use frequency .....	103
Table 5.17: Frequency of app use by demographic characteristics, Mdn (IQR).....	104
Table 5.18: Frequency of app use by behavioural characteristics, Mdn (IQR).....	105
Table 5.19: Univariate and multivariate predictors of indicating yes they use apps to find opposite-gender partners.....	109
Table 5.20: Number and proportion of sexual partners met on apps in previous 12 months by demographic characteristics, Mdn (IRQ) .....	111
Table 5.21: Number and proportion of sexual partners met on apps in previous 12 months by behavioural and health characteristics, Mdn (IRQ) .....	112
Table 5.22: Differences in app partners by gender, n (% agreeing with each statement) .....	114
Table 5.23: Differences in app partners by proportion of LGBTQ+ friends who use GSN apps n (% agreeing with each statement; all genders) .....	115
Table 5.24: Differences in app partners by main reason for using apps, n (% agreeing with each statement; all genders) .....	116
Table 5.25: Univariate and multivariate predictors of agreeing with statement "I have more [sexual] partners now I use apps".....	118
Table 6.1: Strategies to ensure quality and rigour in study 2 (developed from Bloomberg and Volpe, 2012; Mclean et al., 2020) .....	143
Table 6.2: Case classifications used for NVivo analysis .....	147
Table 6.3: Phases of thematic analysis - adapted from Braun and Clarke (2006) and Braun et al. (2018)....	148
Table 7.1: Interview participant demographics, Merseyside .....	152
Table 7.2: Interview participant demographics, Connecticut .....	153
Table 7.3: Five main reasons for using GSN apps.....	157
Table 7.4: All apps ever used by 33 interview participants .....	160
Table 8.1: Themes from objective 1: Patterns and motivations for using apps.....	209
Table 8.2: Themes from objective 2: Positive outcomes and benefits of app use .....	212
Table 8.3: Themes from objective 2: Negative outcomes and risks of app use.....	214
Table 8.4: Themes from objective 3: Influences on how people use apps .....	218

Table 8.5: Themes from objective 4: Strategies to balance risks and benefits.....	222
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## List of Reflection Boxes

Reflection box 1.1: My experience using GSN apps .....	21
Reflection box 3.1: Paradigms and my view of the world .....	60
Reflection box 3.2: Final decision on terms and target population .....	67
Reflection box 3.3: Ethics - are LGBTQ+ people "vulnerable"? .....	69
Reflection box 3.4: Ethics – GDPR .....	70
Reflection box 3.5: Two ethics committees.....	71
Reflection box 4.1: Putting people in boxes .....	76
Reflection box 4.2: Lost participants .....	79
Reflection box 4.3: "Why not recruit through the apps?" .....	82
Reflection box 4.4: Facebook advertising challenges .....	85
Reflection box 4.5: Challenges with exploratory analysis.....	88
Reflection box 6.1: Personal interview style.....	144
Reflection box 6.2: Inductive analysis .....	150
Reflection box 7.1: Sexual health questions in general interviews.....	193
Reflection box 9.1: What I would do differently next time? .....	230
Reflection box 9.2: Will app companies change? .....	233
Reflection box 9.3: Gender and sex within this programme research .....	235
Reflection box 9.4: Final thoughts .....	237

## List of Presentations

Madden, H.C.E (2019) *Putting people in boxes - the challenges of using quantitative methods to understand sexual behaviour of LGBTQ+ people*. Oral presentation, British Psychology Society, Psychology of Sexualities Annual Conference; London.

Madden, H.C.E (2019) *How do men and women use dating and hook-up apps to find same-gender partners? Cross-national research in the UK and USA*. Poster presentation, British Psychology Society, Psychology of Sexualities Annual Conference; London.

Madden, H.C.E (2019) *How does using Grindr influence health & happiness? Cross-cultural research in the UK and USA*. Oral presentation, Research Café, University of Liverpool.

Madden, H.C.E (2019) *How do smartphone dating apps influence the health & happiness of LGBTQ+ users?* Oral presentation, University and College Union's LGBT+ Research Conference, University of Manchester.

Madden, H.C.E, Hillis, A., Bista, S. & Tamang, P. (2019) *Experiences of researching "hard to reach" populations*. Pre-conference workshop, Health Research PhD Symposium, LJMU.

Madden, H.C.E (2019) *How do smartphone dating apps influence the health & happiness of lesbian, gay and bisexual users?* Three Minute Thesis Competition final, Doctoral Academy Conference, LJMU.

Madden, H.C.E (2018) *How effective is commercial Facebook advertising for recruiting participants? Challenges & lessons learnt from cross-cultural LGBT+ health research*. Poster presentation, Institute of Health Research Conference, LJMU (2nd prize for poster presentation).

Madden, H.C.E (2018) *A cross-cultural exploration of dating app use by people seeking same-gender partners in the UK and USA*. Visiting scholar presentation, Southern Connecticut State University, USA.

Madden, H.C.E & Hibbert, M. (2018) *A user guide to Facebook advertising for health research: successes, trials and tribulations*. Workshop, PHI Public Health Symposium, LJMU.

Madden, H.C.E (2017) *A cross-cultural exploration of dating app use by people seeking same-sex partners in the UK and USA*. Oral presentation, Festival of Public Health, Manchester University.

## Glossary of terms

<b>AIDS</b>	Acquired immunodeficiency syndrome. A number of potentially life-threatening infections and illnesses that happen when an immune system has been severely damaged by the HIV virus
<b>Asexual</b>	Having no sexual attraction to anyone
<b>BAME</b>	Black, Asian, and minority ethnic
<b>Bareback/ barebacking</b>	Anal sex without a condom, usually planned to enable maximum pleasure. AKA “raw”
<b>Bisexual</b>	Someone is attracted to both men and women. Often abbreviated to “bi”
<b>BOS</b>	Bristol Online Survey (tool used in study one)
<b>CAI</b>	Condomless anal intercourse
<b>Catfishing</b>	To lure or trick someone online using a fictional persona. The name comes from an American film and reality TV show where the hosts investigate on behalf of someone who suspects they may be interacting online and having a relationship with someone fake.
<b>Chemsex</b>	Use of any combination of drugs (e.g. crystal methamphetamine, mephedrone and/or GHB/GBL) specifically for the purposes of gay sex
<b>Cisgender</b>	Someone whose gender identity is the same as the one they were assigned at birth - a person who is not trans. Often abbreviated to “cis”
<b>CIAI</b>	Condomless insertive anal intercourse
<b>CRAI</b>	Condomless receptive anal intercourse
<b>Demiromantic/ Demisexual</b>	Only experiencing sexual attraction to someone with whom you have a strong emotion connection
<b>Discreet</b>	Persons, usually MSM, who are generally secretive or not open about their sexual orientation or sexual practices. AKA “downlow”
<b>Gender</b>	Gender is a social construct that relates to behaviours, an internal perception and how one sees oneself as a man, woman or another gender identity
<b>Gender diverse</b>	Umbrella term for people whose gender identities or express are beyond the binary framework of male/female
<b>Ghosting</b>	The practice of ending a personal relationship with someone by suddenly and without explanation withdrawing from all communication. Usually involves blocking them on all technology
<b>GPS</b>	Global positioning system. A satellite based radio navigation system used to identify location. Inbuilt into smartphones and utilised by most GSN apps
<b>GSN apps</b>	Geosocial networking smartphone applications. AKA “dating apps”, “sociosexual networking apps”, “hook-up apps”
<b>HIV</b>	Human immunodeficiency virus
<b>IPV</b>	Intimate partner violence. AKA “domestic abuse” or “domestic violence”
<b>IRB</b>	Internal Review Board (US equivalent of the REC)
<b>LGB</b>	Lesbian, gay and bisexual. This term is used when talking specifically about MSM and WSW, rather than the wider LGBTQ+ community

<b>LGBTQ+</b>	Lesbian, gay, bisexual, trans, queer and others (an umbrella term for all sexual minorities and gender diverse people). Often used internally with "sexual minorities"
<b>LJMU</b>	Liverpool John Moores University
<b>Magic unicorn hunters</b>	A man-woman couple who are seeking a (usually bisexual) woman to have sex (a threesome) with them. The woman they are seeking is called the "magic unicorn" because she is unlikely to exist
<b>MMR</b>	Mixed methods research
<b>MSM</b>	Men who have sex with men
<b>NATSAL-3</b>	The British National Survey of Sexual Attitudes and Lifestyle. Study conducted every ten years in the UK with a nationally representative sample of all genders and sexual orientations. The third study (NATSAL-3) was conducted in 2010-2012 with 15,162 participants (Erens et al, 2014)
<b>NHS</b>	National Health Service in the UK
<b>Non-binary</b>	Individuals who do not identify as a man or woman, they may identify as a third gender or feel they have no gender
<b>Pansexual</b>	Someone who is attracted to all people, not matter what their gender (generally used to include attractions to trans or non-binary people as well as men and women). Abbreviated to "pan"
<b>Plurisexual</b>	A sexual orientation that involves attraction to more than one gender - an umbrella term that can include bisexual and pansexual people
<b>PIS</b>	Participant information sheet
<b>Poly/ polyamorous</b>	The practice of having intimate relationships with more than one partner, with the informed consent of all partners involved
<b>Queer</b>	A general umbrella term used to describe sexual minority or gender diverse people, behaviour, politics or behaviour. Often used interchangeably with "LGBTQ+"
<b>Raw</b>	Anal sex without a condom. AKA "barebacking"
<b>REC</b>	Research Ethics Committee (at LJMU)
<b>Sex</b>	As opposed to gender, sex is defined as biological aspects of an individual as determined by their anatomy, which is produced by their chromosomes and hormones; sex is assigned at birth and usually refers to male or female.
<b>Sexual minorities</b>	An umbrella term for all lesbian, gay, bisexual, trans, queer and other sexual and gender diverse individuals. Often used internally with "LGBTQ+"
<b>Sapiosexual</b>	Sexually attracted to intellectual or mental qualities, not physical bodies
<b>SCSU</b>	Southern Connecticut State University
<b>Serosorting</b>	The practice of using HIV status as a decision-making point in choosing sexual behaviour (i.e. only having condomless anal intercourse with HIV negative partners)
<b>STD</b>	Sexually transmitted disease (predominantly used in the US)
<b>STI</b>	Sexually transmitted infection (predominantly used in the UK)
<b>UAI</b>	Unprotected anal intercourse
<b>WSW</b>	Women who have sex with women

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# Chapter One | Introduction

## 1.1 Introduction

The purpose of this cross-cultural, mixed methods study was to explore how geosocial networking (GSN) apps<sup>1</sup> influence the health of lesbian, gay and bisexual<sup>2</sup> (LGB) people in the UK and USA. The study investigates patterns of GSN app use, how users view the impact of these apps on their health, the factors influencing behaviour on apps and how people protect their health when using the apps.

The research was divided into two parts; study one was a quantitative survey designed to understand patterns of use, gather general information about the way participants use GSN apps and understand if there were any differences between the UK and US sites or between genders. Study two was an exploratory qualitative study, using semi-structured interviews and photo elicitation. This second study aimed to understand, in more detail, how people in the UK and USA use apps, how they view the health impacts, influences on their behaviour and any health protective or harm reduction strategies. The existing evidence base has demonstrated that LGB people are between three and eleven times more likely to meet partners online or use GSN apps (Cabecinha et al., 2017; Rogge et al., 2020). Thus, the overall aim of this thesis was not to investigate *if* LGB people use GSN apps or the proportion using apps, but to investigate *how* people use apps, their behaviours and motivations for using the apps and how these relate to health. Use of GSN apps is near ubiquitous amongst LGB people looking for sexual partners and relationships; exploring the difference between those who use and do not use apps is no longer a significant research question. Understanding *how* people use GSN apps, what influences behaviour and how people make decisions about health is important to design effective health interventions.

## 1.2 Research question and objectives

The core research question of this study is “How do people in Connecticut and Merseyside use smartphone geosocial apps to meet same-gender partners and how do they manage impacts on their health?” There are five main research objectives (figure 1.1):

1. Understand patterns and motivations for using GSN apps by people seeking same-gender relationships/sexual partners in Merseyside and Connecticut. (Studies 1 and 2)

To understand the patterns of app use by the populations in the two study sites, which apps they use and how often, their intentions and motivations for use, what kind of partners they have on apps and what factors are associated with higher numbers of sexual partners.

2. Investigate how people in Connecticut and Merseyside who use GSN apps view the benefits of apps and any potential health risks. (Studies 1 and 2)

To investigate any health outcomes users have experienced and how they perceive the benefits of using apps (including social, health, sexual pleasure and emotional benefits). This research will also investigate what users

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<sup>1</sup> Also known as *dating apps*, *hook-up apps*, *socio-sexual apps* or *sexual networking apps* - the most commonly known are Grindr and Tinder. Brief descriptions of the most popular GSN apps are included in appendix A.

<sup>2</sup> The term “plurisexual” is also used in this thesis to refer to people who are attracted to more than one gender – plurisexual it is an umbrella term that includes those who identify as bisexual, pansexual etc.



perceive to be the potential risks of GSN apps - including social and emotional risks, personal safety and sexual, mental and physical health.

3. Explore what influences how people in Connecticut and Merseyside behave whilst seeking sexual/romantic partners on GSN apps. (Study 2)

To investigate what individual and societal factors influence how people use GSN apps to find partners. This research will explore how environmental influences, personal capacity and peers impact on their use of GSN apps.

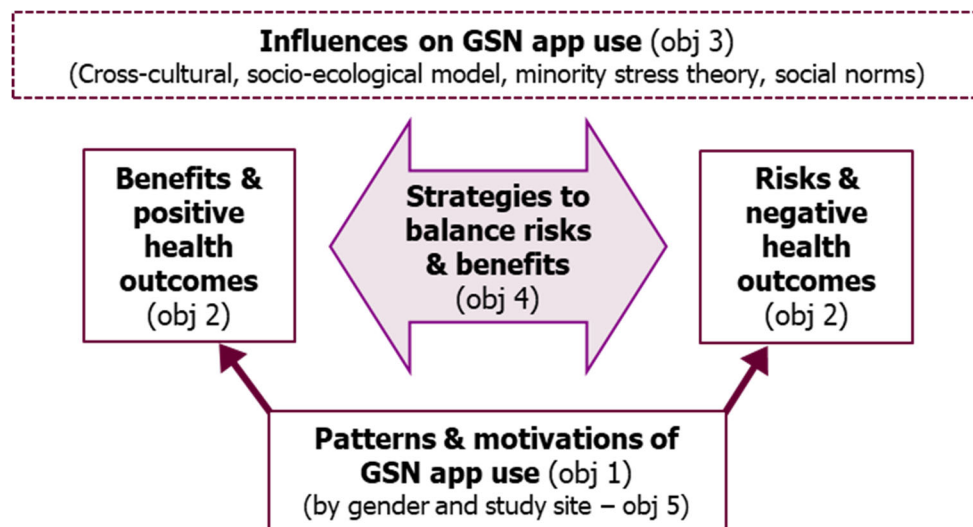
4. Explore what, if any, strategies GSN app users in Connecticut and Merseyside may employ to maximise positive health outcomes, ensure their safety and reduce risk to health. (Study 2)

To investigate what, if any, physical and mental health-protecting behaviours and harm reduction strategies people use to increase the benefits and reduce risks (as identified in objective 2).

5. Examine any differences and similarities in behaviour between study sites in the UK and USA, gender groups and sexual orientation groups. (Studies 1 and 2)

To identify if gender, cultural or community influences affect GSN app use, perceptions of benefits and risks, use behaviours and harm reduction strategies.

Figure 1.1: Relationship between the five research objectives



## 1.3 Rationale

Despite records showing same-gender sexual activity existing for thousands of years, the health behaviour and identity of same-gender attracted people only became the focus of study in the last few decades (Spencer, 1995; Beaulieu-Prévost and Fortin, 2015). Historically, research on LGBTQ+ health has mostly focused on human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS), sexually transmitted infections (STIs) and on gay men (Boehmer, 2002). Recent quantitative and epidemiological research have been vital in identifying widespread health inequalities; LGB persons are more at risk of a range of health conditions including mental ill-health, sexual ill-health and higher rates of suicide, substance use and some

cancers (Meyer, 2003; King et al., 2008; Dilley et al., 2010; Chakraborty et al., 2011; Institute of Medicine, 2011; Lick et al., 2013; Hudson-Sharp and Metcalf, 2016; Mercer et al., 2016). Plurisexual people (those attracted to more than one gender, e.g. bisexual or pansexual) are at even higher risk of ill-health than their gay/lesbian counterparts (Dilley et al., 2010; Colledge et al., 2015; Booker et al., 2017).

Understanding the sexual behaviour of men who have sex with men (MSM) became a priority during the early years of the HIV/AIDS epidemic in the 1980s, however, other health research was still rare with LGBTQ+ populations up until the turn of the century (Boehmer, 2002). Sexual ill-health of MSM still drives the research agenda in 2020. In the UK, MSM remain the group most at risk of HIV infection, although new diagnoses declined by 39% between 2015 and 2018 (Public Health England, 2019b); mainly due to PrEP<sup>3</sup> and treatment as prevention. In the USA, the majority of HIV diagnoses are also transmitted through male-to-male contact and the rate is remaining steady (Centers for Disease Control and Prevention, 2020). Although data are not routinely collected, the prevalence of HIV and STIs is presumed lower in lesbian and bisexual women, however sex between women can transmit most bacterial and viral STIs (Bailey et al., 2003; Gorgos and Marrazzo, 2011; Ellis, 2015; Public Health England, 2019a). Women who have sex with women (WSW) are routinely left out of sexual health promotion, research, government policy or conversations about sex and sexual health (Power et al., 2009; Formby, 2011).

LGBTQ+ populations have always been at the forefront of ways to build community, creating independent venues and utilising novel technology (such as phone lines, the internet then smartphone apps) to find support, friends, romance and sexual partners (Liau et al., 2006; Rosser et al., 2011; Grov et al., 2014; Ackroyd, 2018). The first GSN app, Grindr, was launched in 2009 and was aimed exclusively at MSM. It differed from the websites accessed on laptops or desktops because Grindr uses the geospatial positioning technology (GPS) of smartphones. The app is accessible any time an individual has their phone connected to the internet (Wi-Fi or 3/4/5G) and presents users in order of proximity, effectively sorting by availability and convenience. A variety of other apps were launched within the next five years including those for MSM (e.g. Scruff, Jack'd), WSW (e.g. HER), and all people regardless of sexual orientation (e.g. Tinder, PoF, Bumble). All the apps have slightly different designs, target users and unique selling points (see appendix A for overview of main GSN apps).

The universal nature of the technology has meant the popular GSN apps are now used globally (Cserni, 2019). LGB persons of all genders and those who report same-sex sexual partners are more likely to use GSN apps than heterosexual persons (Rogge et al., 2020). Research with MSM in the last five years has shown use of GSN apps is high in most countries; between 50-76% of MSM in USA have ever used an GSN app, with young black MSM reporting the highest use (Badal, 2018; Duncan et al., 2018b; Macapagal et al., 2018; Sun et al., 2018; Macapagal et al., 2019). In Europe, prevalence of GSN use by MSM is as high as 89% in Paris (Dangerfield et al., 2020), and 65% in Ireland (O'Connor et al., 2018). The only study that has measured GSN app use by MSM in the British Isles found 44% of young MSM in Wales, Northern Ireland, Scotland and Republic of Ireland frequently used GSN apps (Lorimer et al., 2016). However, these data exclude England and were collected in 2012-13, when Grindr was still new and smartphones less common. Globally, GSN app use has increased

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<sup>3</sup> Pre-exposure prophylaxis – HIV medication taken to prevent infection with the virus.

dramatically in the last 10 years (Hull et al., 2016; Wei et al., 2019b), thus 44% is likely to underestimate the proportion of British MSM using apps in 2020.

There is an burgeoning evidence base demonstrating negative health outcomes for MSM who use GSN apps; related to sexual health and HIV risk (Choi et al., 2017; Zou and Fan, 2017; Wang et al., 2018), body image and mental health (Phillips et al., 2014; Goedel et al., 2017b; Filice et al., 2019), harassment, racism and discrimination (Lauckner et al., 2019; Numer et al., 2019; Thai, 2020) and drug use and chemsex (Zou and Fan, 2017; Patten et al., 2020). Recent research investigating negative sexual health outcomes for MSM in France and the USA has found a key factor to be *intensity* of sex-seeking behaviour<sup>4</sup>; just using GSN apps does not appear increase risk (Allen et al., 2017; DeVost et al., 2018; Dangerfield et al., 2020). However, overall these North American, Australian and Chinese studies have been cross-sectional and only demonstrated an association not cause and effect. Moreover, very few of these studies have examined how users perceive the impact on their health, what influences their apps use or how they manage their app use.

WSW are more likely than heterosexual women to have met sexual or romantic partners on the internet or through GSN apps (Cabecinha et al., 2017; Watchirs Smith et al., 2018), however, the few studies did not differentiate between apps or general internet use. Given that WSW are also a minority population who embraced the same social avenues and technology as MSM, it is reasonable to assume high uptake of GSN apps by WSW, at least by those who are single or are looking for romantic or sexual partners. The research is extremely limited on how and why WSW use technology to meet partners and any potential health outcomes. The little evidence available from Australia, Canada, New Zealand and the UK about GSN app by WSW focuses on managing identity on GSN apps, experiences of discrimination and how women “stay safe” on apps (Albury and Byron, 2016; Pond and Farvid, 2017; Ferris and Duguay, 2020).

For all genders, there is a dearth of evidence demonstrating the positive health outcomes or social benefits of using GSN apps; the existing research focuses on sexual and mental ill health (Choi et al., 2017; Zou and Fan, 2017; Wang et al., 2018; Bonilla-Zorita et al., 2020). Public health research tends to focus on risk and danger and ignores the positive impacts apps may have on an individual. It is reasonable to assume that the perceived benefits for individuals outweigh the risks if people continue to use apps despite the potential negative outcomes.

This study is not aiming to measure the distribution of health outcomes in app users, a plethora of health research has measured a variety of risk behaviours in MSM apps users (Choi et al., 2017; Zou and Fan, 2017; Wang et al., 2018). As time goes on, comparing users and non-users is less necessary; app use is near ubiquitous and is not going away. Deeper understanding is needed of how people use GSN apps to find same-gender partners, what motivates people, how they view the wider positive and negative outcomes, what influences behaviour on apps and any existing strategies people use to reduce risk and maximise positive outcomes. Understanding these issues can provide information for health professionals, policy makers and app developers themselves. Health promotion is most effective when it builds on what people already do, working

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<sup>4</sup> Number of avenues, routes or technologies used to find sexual partners; for example GSN apps, saunas/bathhouses, bars, cruising areas, websites etc.

with a person's capabilities, opportunities and motivations to make manageable changes in behaviour (Michie et al., 2011; Michie et al., 2014).

## 1.4 Research context

This study used cross-cultural, comparative mixed methods research to understand behaviour of LGB people across two study sites; one in the UK and one in the USA. Cross-cultural comparative health research aims to understand and explain phenomena by describing similarities and differences between the occurrences in different areas. This can inform the actions of local practitioners, managers or health-policy-makers (Øvretveit, 1998). The majority of research on health and GSN apps has been conducted in the USA and with MSM. To my knowledge, this is the first mixed methods research to examine GSN app use by people in England seeking same-gender partners through GSN apps. Since the time when this PhD was designed and funded in late 2016, the evidence base has doubled. Despite this, UK studies, research with WSW, mixed methods and cross-cultural research still remain rare (see section 2.10). This study will increase understanding of this important, contemporary public health issue by filling some of the gaps in this emerging area of research.

Merseyside and Connecticut were chosen for three pragmatic reasons. Firstly, there was an existing link between LJMU and Southern Connecticut State University (SCSU), with student and staff exchanges and shared PhD students. Secondly, research on GSN apps and health in smaller cities or towns is rare, both in UK and USA. Thirdly, Connecticut and Merseyside are similar (see below) so comparing behaviour in the two areas could provide some evidence about whether the USA research may be applicable in the UK.

*Figure 1.2: Merseyside (UK) and Connecticut (USA)*



Photo credit: Wikipedia.com

The majority of LGBTQ+ health research in the UK is conducted in areas with large thriving gay communities, such as London, Manchester and Brighton. However, exploring experiences of those living in other areas is important to understand broad experiences of LGBTQ+ life in the UK. London has, not surprisingly, been the focus of the research on GSN apps with one quantitative study examining PrEP awareness of app-using MSM

(Goedel et al., 2017a; Goedel et al., 2019) and two qualitative studies looking at identity, technology and space for MSM (MacKee, 2016; Miles, 2017). Limited qualitative research has also examined identity and masculinity on GSN apps by MSM in London and the East Midlands (Jaspal, 2017) and Newcastle-upon-Tyne (Bonner-Thompson, 2017). A study specifically examining chemsex recruited MSM through GSN apps across the whole of the UK (Blomquist et al., 2020). The only studies recruiting from other areas of the UK have looked at safety of using GSN apps in rural areas of Scotland (Davis et al., 2016) and investigated use of social media and GSN apps by young MSM Scotland, Wales, Northern Ireland and Republic of Ireland (excluding England; Lorimer et al., 2016). The authors of the Scottish, Welsh and Irish study called for research in other settings outside of the USA to investigate if the patterns and frequency of digital technology use is the same in Europe and the USA (Lorimer et al., 2016). This study aims to fill some of these gaps in the evidence base.

Merseyside is a diverse region of the UK with areas of high inner-city deprivation and more affluent suburban and rural areas. The main city, Liverpool, is one of the largest in the UK and has a large student population and relatively ethnically diverse population. In the wider county, there are many towns and villages which have comparatively few services and little diversity. Merseyside has a relatively small “gay community” with a handful of gay bars, community groups and charities supporting LGBTQ+ people. The region hosted its first pride in 2010, which was relatively late for a city of its size. Examining health related behaviours on GSN apps in an area such as Merseyside is likely to provide evidence that is more generalisable to other areas of the UK. Recruitment did not just focus on Liverpool, to ensure experience of those in smaller towns and more rural areas was also included.

Comparing health behaviour in the UK to the USA allows us to understand if the USA evidence base is applicable in the UK. However, the majority of the USA research has been conducted in large metropolitan areas such as New York (e.g. Rendina et al., 2014; Goedel and Duncan, 2016; Goedel et al., 2016a), Los Angeles (e.g. Landovitz et al., 2013; Holloway et al., 2015; Huang et al., 2016a; Rosengren et al., 2016), Atlanta (e.g. Goedel and Duncan, 2015; Goedel et al., 2016b; Goedel et al., 2017c) and Washington DC (Phillips et al., 2014; Smiley et al., 2020). There is a dearth of research with MSM in smaller cities, towns or rural areas of the USA. A minority of research recruited men on Grindr from across the USA (Macapagal et al., 2016; Macapagal et al., 2018; Chu et al., 2019) or men from a smaller towns or USA colleges (Lehmiller and Iorger, 2014; White Hughto et al., 2017). The research in smaller towns and in rural areas tends to be qualitative and focuses on the challenges of being a MSM in a rural area (Schipani-McLaughlin et al., 2017; Lauckner et al., 2019).

The USA is a huge country with major differences between states. It would be inappropriate to compare the whole of the UK and the whole of the USA. There are substantial differences between liberal north-eastern states (e.g. Connecticut or New York) and conservative southern states (e.g. Texas or Alabama) in relation to the societal attitudes towards sexual-minorities and legislation protecting against discrimination (Cramer et al., 2017) and these may impact health outcomes. Consideration was taken to ensure the areas selected in the UK and USA areas are relatively similar in terms of LGBTQ+ rights, legislation and politics. Connecticut is one of the smallest US states with a combination of affluent and deprived rural areas, small towns and cities. The three main cities of New Haven, Hartford and Bridgeport all have small gay scenes, a few LGBTQ+ organisations and

all host annual gay pride events. SCSU is based in the small city of New Haven. New Haven is also home to an Ivy League university and contains extreme contrasts of affluence and deprivation. Recruitment for the survey covered the whole of CT, but the majority of interviews were carried out in the New Haven area, due to practical issues.

### 1.4.1 Population in Connecticut and Merseyside

Connecticut is adjacent to the state of New York, on the north east coast of the USA (see figure 1.2). Across the USA, acceptance of same-sex sexual activity is increasing (Twenge et al., 2016). Connecticut is one of the most liberal states of the USA and has similar protective legislation and LGBTQ+ rights to the UK (for example rights around same-sex marriage, hospital visitation, adoption, employment, housing, hate crime and schools (The Guardian, 2015)).

*Table 1.1: Population statistics, Merseyside and Connecticut*

	<b>Merseyside (metro county)</b>	<b>Connecticut</b>
<b>Population (all ages – 2019)</b>	1,429,910	3,565,287
<b>Ethnicity, proportion white</b>	95.5% (2011)	79.7% (2019)
<b>Households with broadband (2014-18)</b>	93% (UK estimate 2018)	83.8% (2014-18)
<b>Area (square miles)</b>	249	4,842
<b>Population per square mile (2019)</b>	5,742	736
<b>Life expectancy at birth</b>	Females: 81.2 years (2015-17) Males: 77.5 years (2015-17)	80.9 years <sup>5</sup>

*(Source: National Center for Health Statistics, 2018; ONS, 2019b; a; 2020; United States Census Bureau, 2020)*

Merseyside Metropolitan County encompasses the five local authorities of Knowsley, Liverpool, Sefton, St Helens and Wirral. The State of Connecticut is made up of eight counties; Fairfield, Hartford, Litchfield, Middlesex, New Haven, New London, Tolland and Windham. SCSU is based in New Haven County. Table 1.1 shows some basic statistics on the populations in the two study sites. Although CT is one of the most densely populated US states, Merseyside is nonetheless considerably more densely populated than CT (table 1.1). The main difference between CT and MS is ethnicity, with CT, and indeed the whole of the USA, having a higher proportion of people from black, Asian and minority ethnic groups (BAME; CT 80% white and MS 96% white). Broadband access may be taken as a proxy indicator of uptake of technology and possibly smartphone use. Home broadband coverage is higher in the UK, however, this may be due to the date the data were collected. The two areas have similar life expectancies.

### 1.4.2 Health services in Connecticut and Merseyside

One of the most fundamental differences between the UK and USA relates to the design of health services. In England the National Health Service (NHS) is tax-funded, available to all citizens free at the point of service and is governed centrally. In contrast, the US health-care system is funded by a mix of private and public insurance, has high point-of-service fees for many users, and provides healthcare through not-for-profit, private and public providers. The US system is also largely competitive and ungoverned (Blumenthal and Dixon, 2012). The US health system uses 18% of the nation's GDP (half of which is public expenditure), compared to 8.4% of UK

<sup>5</sup> Data are not available at state level on life expectancy by sex

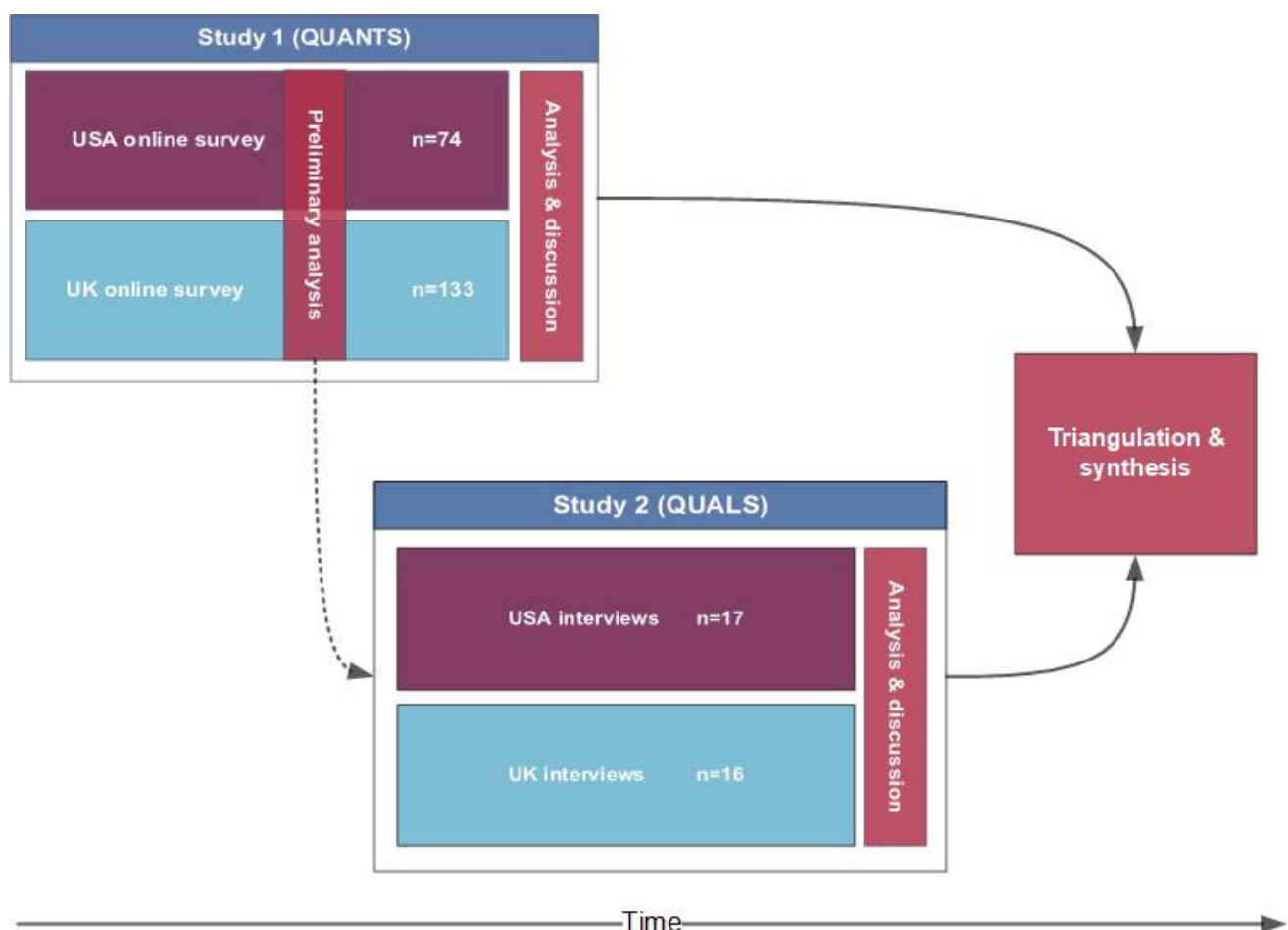
GDP. However, in the USA a sixth of the population are uninsured (Blumenthal and Dixon, 2012). The Affordable Care Act of 2010 (often referred to as 'Obama Care' in the media) extended free healthcare to many Americans and significantly improved trends in health coverage, access to primary care and medications, affordability, and health (Sommers et al., 2015).

In the UK, NHS sexual and mental health services are free to use, though availability varies across the country and there may be long waiting lists for mental health services. In the USA some charities provide free sexual health and mental health services but most people would access these through health insurance, if they have it. Those that do have insurance may still pay a fee for the service on top of their health insurance premium (e.g. in the UK we would call this an "excess"). Financial cost of treatments can prevent people from accessing primary care, sexual and mental health services in the USA.

## 1.5 Research approach

This thesis used a two stage, mixed methods approach to examine health behaviour of GSN app users in Connecticut and Merseyside (see figure 1.3). The exploratory, cross-sectional online survey investigated patterns of use by people in the two study sites who use GSN apps to meet same-gender partners. The survey was open from March 2018 – March 2019. The preliminary findings of this study informed the focus and methodology of the second, qualitative study.

Figure 1.3: Design of this research study





The semi-structured interviews used photo-elicitation (fake, mock-up profiles based on Tinder and Grindr) to investigate how people interpreted the impacts on their health, influences on health and how they managed risk on apps. The interviews were conducted between September 2018 and May 2019 with two field trips to CT totalling three months. The quantitative research was conducted first then ran concurrently with the qualitative research for six months. The findings of each data collection phase were analysed separately and then triangulated at the end using the Farmer et al. (2006) protocol. The triangulation is presented in relation to the five objectives of this research.

## 1.6 Contribution to knowledge

Health behaviour on GSN apps is a relatively new field of public health research and very little is known about how people manage their use of apps to find same-gender partners. The existing evidence based has mainly examined associations between app use and risk behaviours and ill-health, very little research has examined what factors influence an individual's behaviour on apps or how people reduce risks to their health.

There is very little evidence about GSN app use from the UK and we cannot know whether the existing evidence from the USA, China and Australia is applicable to the UK. GSN apps do not exist in a vacuum; users have "real world" friends, families and jobs and these will be different in different locations. Social context, where people live and the people around them may influence GSN app use. Comparing experiences of LGBTQ+ people using GSN apps in the UK and USA will reveal the impact of social norms and how local culture can influence behaviour, harm reduction strategies and health. No research has placed the use of these apps in a social or cultural context or compared the differences between areas. Understanding differences between GSN app use in comparable areas of the UK and USA allows us to understand if the North American evidence is relevant in the UK, reducing the need to repeat research.

This study makes several important and novel contributions to the field. Firstly, to my knowledge, it is the first study to use in-depth, mixed methods to examine behaviour on GSN apps. Secondly, it is the first study to compare app use in two countries, investigating cultural influences and whether the US evidence is applicable in the UK. Thirdly, it is the first study to examine GSN app use by all people seeking same-gender partners, not just MSM. Fourthly, this research is taking a sex-positive approach<sup>6</sup> and examining potential health benefits of GSN apps not just the risks and harms.

Additionally, this PhD examines people's behaviour through the novel theoretical lens of the socio-ecological model of health (McLeroy et al., 1988), demonstrating that factors across most levels of the model influence how LGB people use GSN apps. The findings also confirm many of the risks and negative health outcomes of GSN app use reported by MSM in previous research are experienced by MSM in the UK. The current programme of research develops this further and shows that many of the risks to self-esteem and mental health, personal safety and fear of deception are also experienced by WSW who use GSN apps. The findings also demonstrate, for the first time, that GSN app users report many benefits and positive health outcomes from their app use, especially related to mental health and social support, both of which can ameliorate the impact of minority

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<sup>6</sup> Sex-positivity regards consensual sexual activities as potentially positive and healthy, as opposed to viewing sex as risky or deviant (Harden, 2019)



stress (Meyer, 2015). Reducing minority stress, should in turn, reduce health inequalities for LGB people. Participants of all genders use many similar strategies to balance the risks and benefits of their app use; health improvement efforts could build on these existing strategies.

## 1.7 Researcher position

Prior to commencing this PhD, I had worked in public health research for 12 years, both in academia and the NHS. My first job was as an epidemiology research assistant collating HIV surveillance data for the North West of England and supporting broader sexual health research. The five years in that post cemented my passion for improving sexual health and reducing health inequalities for LGBTQ+ populations. For the next seven years I worked on a variety of applied health research projects, needs assessments and evaluations; the thread running through all of these was health inequalities and increasing access for minority populations.

Due to my experiences, in both my personal (see reflection box 1.1) and professional life, I took steps during design, data collection and analysis to ensure my biases did not affect the research (see section 6.5). During data collection, especially the qualitative study, I kept a research diary detailing my observations, frustrations, challenges and reasons behind decisions. Throughout this thesis the reflection boxes provide insight into challenges and lessons learnt; I reviewed my field notes as I was writing up and they form the basis of these reflections. These boxes contain an examination and explanation of how I may have influenced the research project; not just “owning up” to how my biases may have contaminated the findings but also reflecting on how my experiences changed the direction of the study and influenced decisions (Given, 2008; Cousin, 2016).

## 1.8 Overview of thesis

Chapter two provides a review of the literature that underpins this research. The chapter starts with a discussion of some key issues with language and definitions in relation to heterosexism, LGBTQ+ identity and app technology. The theoretical frameworks that underpin this research (minority stress theory, cross-cultural research, socio-ecological model of health, social norm theory and sex positive research) are explained before the general literature review. LGBTQ+ people experience well documented physical and mental health inequalities, which are discussed, alongside factors that are protective to health. A brief background to LGBTQ+ dating is outlined along with how the internet and new smartphone technologies developed into a key part of the personal lives of LGBTQ+ people. The core of this chapter is a critical synthesis of the evidence base on the use of GSN apps by MSM and WSW and associations with health outcomes and behaviour. The vast majority of this research has focused on MSM. The chapter ends with the conceptual framework for this programme of research and a discussion of the key gaps in the literature.

Chapter 3 presents an overview of the methodology of the wider research examining paradigms and my position as a pragmatist. The mixed methods approach is critically discussed. This chapter also includes a discussion of identity and labels within the LGBTQ+ population and how the research was targeted as well as an overview of ethical considerations for both studies. Chapters 4 and 5 present the detailed explanation of methods, findings and discussion of the explorative and descriptive, cross-sectional online survey with people in CT and MS who use GSN apps to meet same-gender partners.

Chapters 6 and 7 present the detailed description of the methods, findings and discussion of the semi-structured interviews with people in CT and MS who use GSN apps to meet same-gender partners. Chapter 8 triangulates the findings from the two studies using a protocol developed by Farmer et al. (2006). This protocol provides a framework to explore where findings from the two studies agree or contradict each other. Chapter 9 returns to the research objectives to draw final conclusions and discuss the limitations of the research and legacy of how future research can be improved. This thesis ends with recommendations for app users, policy makers, health professionals and app developers. A glossary of acronyms and some more obscure terms is included in at the start of this thesis.

### **Reflection box 1.1: My experience using GSN apps**

Since my mid-twenties (~2006) I have been involved in LGBTQ+ committees, groups and social events in Liverpool. I also threw myself into the technology that helps create this community. I used dating websites in the 2000s and in the 2010s found GSN apps an absolute joy to use. I loved the gamification element, chatting to total strangers and I have always enjoyed actual dates. It was just so much fun spending the evening in a pub with someone interesting. I found GSN apps weird, fascinating and entertaining. I met my partner on Tinder in 2015, it was a casual thing that turned into a life together with a mortgage and two cats. I acknowledge I owe a lot to GSN apps as there is no way I would have crossed paths with her without Tinder.

Most of my close LGBTQ+ friends have all gone through phases of being single and all used GSN apps over the last 10 years. Our lesbian WhatsApp group is full of funny stories about weird dates, screenshots of amusing profiles and requests for advice. The hilarious storytelling ability of my friends made me love apps even more and although the running joke is “all the women on apps are crazy”, we have found love, sex, friendship and community through these apps. One of these friends has just become single again and on the morning I write this reflection box sent a screenshot of a weird conversation she was having on POF and we replied, “That is a fake picture”, “That is definitely a catfish” and “DO NOT go to meet that person”!

The ups and downs of queer people’s dating, the issues and dangers, hilarity and social support, emotional and mental turmoil are entirely absent in the research. The research with MSM tends to focus on condom use or drug use and this only reflects a small proportion of the stories my gay male friends tell me. For queer people of all genders – how do we cope with rejection? What happens when dates turn weird? Or what if one person gets too drunk? What about turning up and finding your date is ten years older than you thought? How does it feel to see your ex on an app?

All the research looks at the negatives and risks of GSN apps. Public health can be so doom and gloom – people must think the public health professionals have never had sex or got drunk. We ruin everyone’s fun! I wanted a more balanced view. I wanted to understand health benefits, love and feeling good about yourself, getting laid and health protective factors and the (informed) decisions people make. A sex positive approach was vital to think about things positively and not just view sex as a risky activity (section 2.3.3).

Reflecting on my position, I came at this research thinking GSN apps are generally a good thing. They have connected many isolated, lonely and horny people. However, I also acknowledge they do involve risks, may be changing the way we build community and people don’t always treat each other very kindly. I wanted this piece of research to encompass the whole spectrum of experiences; from danger to happiness, true love to rejection, friendship to mind-blowing sex. I also wanted to give credit to app users who already use a variety of techniques to stay safe, maximise benefits and reduce the risk to their health.

## Chapter Two | Literature Review

### 2.1 Introduction

The aim of this literature review is to critically examine the role GSN apps have in the health of WSW and MSM. The literature review will focus, where possible, on research from the UK and the USA. However, due to the relative novelty of the technology and limited evidence base, global research will be examined where appropriate. Section 2.2 provides a context to the literature review, and the whole thesis, by discussing some of the key issues with language and definitions in relation to heterosexism, LGBTQ+ identity and technology. The key theories relevant to this review are explained in section 2.3, and section 2.4 details the literature review methodology. Section 2.5 introduces the evidence of health inequalities within the LGBTQ+ community, section 2.6 examines factors protective to health and section 2.7 discusses how the internet and new smartphone technologies developed to be a key part of the personal lives of LGB people. Section 2.8 presents a critical synthesis of the evidence base on the use of GSN apps by MSM and WSW and associations with health outcomes and behaviour. The final sections of this chapter present the conceptual framework and gaps in literature that will be investigated in this thesis.

### 2.2 Language and definitions

This literature review requires a brief discussion of some key issues related to language and terminology. Language and identity are a sensitive topic for sexual minorities and there is much debate about the “correct” terms. Setting out parameters here clarifies the position of the researcher and the focus of the research (see section 1.7 for the full researcher position statement).

#### 2.2.1 Homophobia, heterosexism and heteronormativity

Over recent decades, acceptance of homosexuality and same-gender relationships has increased in the UK and USA (Prah et al., 2014; Twenge et al., 2016). Anti-discrimination rights are now enshrined in law in both Connecticut and England (Kollman and Waites, 2011; The Guardian, 2015); however, less overt forms of homophobia and discrimination continue to exist and affect the lives and health of LGBTQ+ people. Although the term “homophobia” is widely used in society, queer academics view this term as unhelpful and inaccurate. “Homophobia” emphasises the fear component rather than the anti-gay opinions and focuses on individuals, rather a prejudice within society as a whole (Williamson, 2000). Therefore, academic discussions tend to use “heterosexism” and “heteronormativity”.

Heteronormativity is the “*suite of cultural, legal, and institutional practices that maintain normative assumptions that there are two and only two genders, that gender reflects biological sex, and that only sexual attraction between these “opposite” genders is natural or acceptable*” (Schilt and Westbrook, 2009, p.411). Heteronormativity influences formal structures and everyday social interactions (Farvid, 2015), including organisational and institution policies (e.g. pension rights reserved for opposite gender married couples) and informal social beliefs (e.g. heterosexuality is the assumed and taken-for-granted social norm). Linked to this is heterosexism, which promotes heterosexuality as the only valid legitimate expression of sexuality or affection.

Heterosexism and heteronormativity also influence the way health research is conducted; the “normal” or “standard” person is usually viewed as heterosexual. Most research into sex or relationships focuses on heterosexuals or does not acknowledge the sexual orientation of the participants (Braun, 2000; Blair, 2014) leaving the reader to assume all participants are heterosexual. Braun (2000) challenges researchers, particularly heterosexual researchers, to question everyday heterosexism in their methodology not just leave it to gays and lesbian researchers. As discussed in section 2.5, substantial and persistent health inequalities exist for LGBTQ+ people and ignoring sexual identity may obscure fundamental factors influencing health outcomes.

### 2.2.2 Dimensions of sexual orientation

Views of sexual behaviour and orientation have shifted over the last 100 years from an understanding in terms of the homosexual *activity*, to thinking of homosexuality as a *condition* and then to homosexual as an *identity* (McIntosh, 1993). The way we understand and measure attraction, love and sex outside of the heteronormative male/female coupling affects the findings of research.

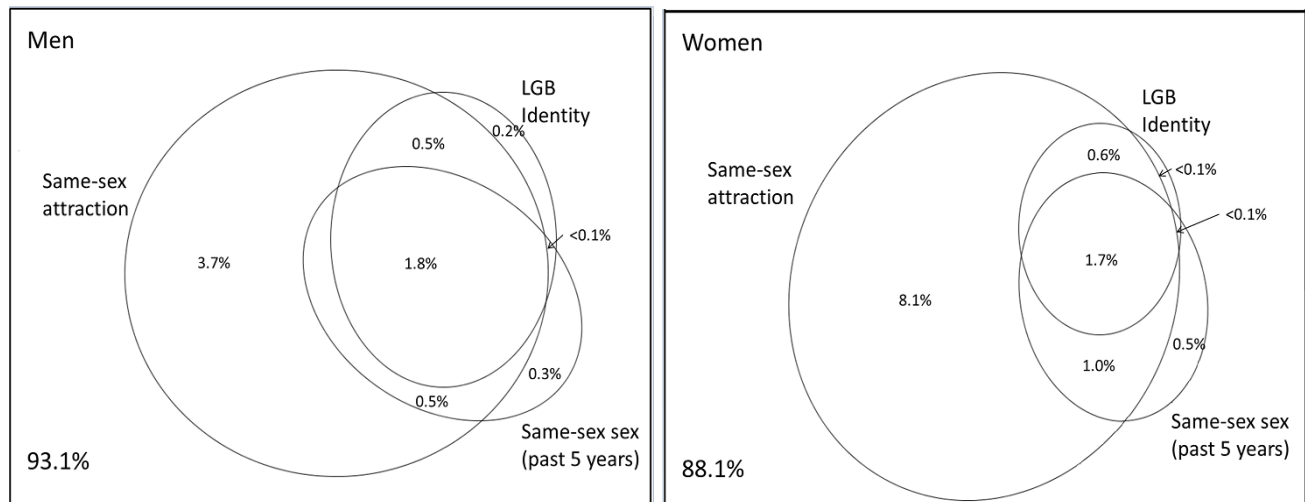
The Kinsey report in the 1940s suggested sexual orientation was better described on a continuum from *exclusively heterosexual* to *exclusively homosexual* rather than by a dichotomous categorisation. In the 1980s this was further developed into the Klein sexual orientation grid which measures sexual orientation via seven items (sexual attractions, sexual behaviours, sexual fantasies, emotional preferences, lifestyle/community, and self-identification; Beaulieu-Prévost and Fortin, 2015). For simplicity, more recently it has become accepted there are three main ways to measure sexual orientation; sexual attraction (who one desires), sexual behaviour (who one has sex with) and sexual self-identification (what label one uses; Institute of Medicine, 2011; Beaulieu-Prévost and Fortin, 2015). The definitions and inclusion criteria can vary based on topic of research, though all research with LGBTQ+ groups tends to measure self-identification, sexual health research will often define sexual orientation based on sexual behaviour, whereas mental health or body image research uses self-identity (Brennan et al., 2017). The problem with using three measures of sexual orientation is that they often misalign - which one should be used for analysis?

For example, there was substantial discrepancy between the three measures of sexual orientation for participants in NATSAL-3<sup>7</sup>, particularly for women (figure 2.1). Although only 2.4% of women and 2.5% of men reported an LGB identity, higher proportions reported experience of same-sex sex (6.1% of women and 5.5% of men) and even higher proportions reported same-sex attraction (11.5% of women and 6.5% of men (Geary et al., 2018). These differences can be huge when looked at in terms of absolute numbers; depending on which measure is used the estimated number of sexual minority people in Britain could range from 547,000 to 1,204,000 men and 546,000 to 1,389,000 women (Geary et al., 2018). This has important implications for funding and services.

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<sup>7</sup> The British National Survey of Sexual Attitudes and Lifestyle study, conducted every ten years in the UK, is a nationally representative sample of all genders and sexual orientations. The third study (NATSAL-3) was conducted in 2010-2012 with 15,162 participants (Erens et al, 2014).

*Figure 2.1: The overlap between same-sex sexual attraction (ever), LGB sexual identity and same-sex sex within the past 5 years for men and women Data from NATSAL-3 (Geary et al., 2018)*



The definition adopted by most research and government organisations to define sexual orientation as homosexual, bisexual or heterosexual is based on the gender of partners *relative to each other*; these definitions rely on biological sex and assume there are only two genders (Institute of Medicine, 2011). Asking if someone is attracted to the “opposite gender” or “same gender” or providing a gender-based continuum (e.g. only sex with men, sex with mainly men, sex with men and women, sex with mainly women, sex with only women) views gender as binary. For people who identify as neither male nor female, or those who have sex/relationships with people who identify as another gender, these questions are impossible to answer.

Public health research has been slow to adapt to changes in the ways gender is perceived or how people express their gender. The term “bisexual” has been traditionally used for people who are attracted to men and women. The term pansexual is used by people who believe there are more than two genders. Those who identify as pansexual, as opposed to bisexual, tend to be younger, more gender diverse (transgender or non-binary) and more politically liberal (Greaves et al., 2019). The term plurisexual covers the broad spectrum of people who are neither heterosexual nor homosexual, and is used as a catch all term for people who are bisexual, pansexual or who are attracted to/love/have sex with more than one gender.

In this chapter, where possible, the terms and measures from the original research have been used. However, where it is not clear the general terms “MSM”, “WSW”, or “LGBTQ+” or “plurisexual” have been used. It is also not possible to give specific focus to the experiences of trans or gender non-confirming people within the scope of this literature review or research. Section 3.3 includes a full discussion of the implications of identity labels in public health and reflection box 3.2 presents the terms used and target population of this thesis.

### 2.2.3 Technological terms

One of the challenges of reviewing literature on smartphones and sex/dating was the language used to describe technology and apps. Research that focuses on Grindr was easy to identify, and as the first and most widely used MSM app it is unsurprisingly the most common in the evidence base; of the 89 studies with MSM reviewed as part of this literature review, 25 (28%) focused solely on Grindr and another five appear to focus on Grindr

but did not explicitly state this. However, when researching other apps (including those aimed at MSM, WSW or the general population) researchers use a variety of terms. These include: *geosocial networking apps* (e.g. Beymer et al., 2016; Rhoton et al., 2016; DeVost et al., 2018); *socio-sexual networking apps* (Shield, 2018); *dating apps* (e.g. Penney, 2014; Pond and Farvid, 2017; Smiley et al., 2020); *hook-up apps* (e.g. Chan et al., 2016; MacKee, 2016; Macapagal et al., 2018); *social networking apps* (Brubaker et al., 2016), and; *geospatial apps* (e.g. Sanchez et al., 2016; Jaspal, 2017).

There does not appear to be any clarity in which apps were described using which terms, or patterns between countries or over time. Importantly, such terms are not neutral; words are value-laden and can imply something about the users or the aims of the app. For example, Grindr has become shorthand for sex-seeking apps, the way Americans use “Kleenex” for any tissues (Woo, 2015), and using the term *hook-up app* in research is likely to perpetuate the sex-seeking norms of Grindr. On the other hand, using the term *dating app* could imply users are looking for more long-term or serious relationships.

This thesis will use the term *geosocial networking app* (and the abbreviation *GSN app*). This seems to be the most widely used term in the literature and “social” is neutral, not implying anything about intention, motives of use or any judgement of outcome. The recruitment material used a variety of more general, lay terms (e.g. “smartphone dating/hook-up apps”, “dating apps” and “smartphone apps to meet same-gender partners”) to ensure it covered the broad spectrum of apps and uses.

## 2.3 Theoretical approach

This section discusses key theories of health behaviour and health inequalities that are identified in the literature review, as they are relevant to GSN apps and sexual minorities.

### 2.3.1 Stress and LGBTQ+ health inequalities

#### 2.3.1.1 Minority stress theory

Minority stress was first proposed as a conceptual framework by Meyer (1995) and developed further in the noughties (Meyer, 2003) as a way to explain health inequalities and the high prevalence of mental disorders in sexual minorities. It has become the leading theory used in the literature to understand LGBTQ+ physical and mental health inequalities. Meyer argued that stigma, prejudice, and discrimination produce stressful and hostile social environments that cause mental health problems. LGBTQ+ people experience not only typical life stressors (e.g. job loss, death of a loved one, illness etc), but also additional stressors that are specific to their minority sexual identity (Hall, 2018). The model describes four main types of stressor: prejudice events (e.g., harassment, violence, discrimination, rejection), expectations of prejudice events, concealment of identity, and the internalization of negative societal attitudes and beliefs (Hall, 2018). The model is based on the premise that prejudice and stigma experienced by LGBTQ+ people causes unique stressors and these cause adverse mental and physical health outcomes (Meyer and Frost, 2013). Throughout this literature review, the links between minority stress and LGBTQ+ health inequalities have been highlighted, including research on mental and physical ill-health, eating disorders and substance misuse (Meyer, 2003; Lick et al., 2013; Mink et al., 2014; Calzo et al., 2017; Pachankis et al., 2020).



Meyer (2016) calls for researchers to explore the links between social environments and stigma and prejudice to understand the impact society and social environment has on the lived experiences of LGBTQ+ persons (across generations and intersections of race/ethnicity, gender and socioeconomic status). He also suggests further research is needed to describe stress and coping of LGBTQ+ people and whether social changes lead to a reduction in health inequalities (Meyer, 2016). Looking at these social environments and wider impacts on health is one of the main facets of the socio-ecological model of health.

### **2.3.1.2 Intraminority gay community stress theory**

Pachankis et al. (2020) have recently developed this theory further aiming to understand why some disparities in the mental health of gay and bisexual men cannot be fully explained by minority stress. They investigated body image, competition and gay men's sexual networks to propose *intraminority gay community stress theory*. They argue that status-focused elements of the gay community challenge the mental health of gay and bisexual men. Pachankis et al. (2020) built on intrasex competition theory (an evolutionary theory that states lower status men experience mental ill-health because of stress and exclusion of missing out on sexual partners), sexual field theory (suggesting gay and bisexual men may be particularly stressed by competitive, sex-focused hierarchies as they measure themselves by the same standards of social and sexual capital as they do their partners), and theory of precarious manhood (in a society which portrays gay and bisexual men as "less than real men" they will go to great lengths to defend their masculine status, at the cost of their mental health).

They developed and tested the Gay Community Stress Scale with four domains; perceived gay community's focus on 1) sex, 2) status, 3) competitiveness and 4) exclusion of diversity. Gay and bisexual men's mental health was predicted by how strongly they perceived these four stresses, even when controlling for minority stress. They found that gay and bisexual men perceive numerous stressors in their sexual and social interactions with other gay men, based on status and competitive pressures within the gay community, and these have implications for mental health. They argue that minority stress and intraminority stress are likely to co-exist but operate through distinct stress pathways (e.g. threat vs. challenge) to affect the mental health of gay and bisexual men. Although this theory appears to present "gay culture" in a negative light, Pachankis et al. (2020) are clear this theory does not undermine the positive role of community cohesion and friendship within the gay community.

### **2.3.2 Social and cultural influences on health**

The interaction between GSN apps and health is a relatively new field of public health research and, as described in this chapter, the overwhelming majority of research into GSN app use by LGB people has been conducted in the USA with some research in China, Australia and a handful of European cities. There is very little evidence about GSN app use by sexual minorities in the UK. Globalisation has led to technology becoming generally homogenous across the globe, including GSN apps. What is unclear is whether people use GSN apps in line with local behavioural norms and social values leading apps to be used differently between countries. Or if, alternatively, the uniformity of the technology itself may lead to changes in local cultural and sexual trends, with people in different countries behaving in similar ways (Cserni, 2019).

### 2.3.2.1 Cross-cultural research in health

Cross-cultural comparative health research aims to understand and explain health phenomena by describing similarities and differences between the phenomena in different areas. This then informs the actions of practitioners, managers or health-policy-makers (Øvretveit, 1998). The broad definition of comparative health research is that it “*creates empirical or explanatory knowledge about health, health services or health systems, by making comparisons using scientific methods that are appropriate for the subject studied and the purpose of the research*” (Øvretveit, 1998, p.6). Cross-cultural health research can focus on a very broad range of research areas including disease, health, behaviour, attitudes, treatments, services, interventions, health organisations, health systems, and healthcare policies (Øvretveit, 1998). This programme of research is focusing on health, behaviour, attitudes and, to a lesser degree, the services people use.

One of the fundamental issues in cross-cultural and comparative research is the operationalisation of “culture”; researchers have, across the years, categorised culture by country, race, ethnicity, sexual orientation, or disabilities (Matsumoto, 2009; Al-Bannay et al., 2013). Culture has been described as “*the rich complex of meanings, beliefs, practices, symbols, norms, and values prevalent among people in a society*” (Schwartz, 2006, p.138). The challenge is defining this “society”. Minkov (2013) argues there is not one correct definition of culture. Culture can be whatever the researcher decides it should be and it can be “*pragmatically defined by the contents and boundaries of the interests of the scholars who study it*” (Minkov, 2013, p.11). In this study, culture is defined by the country of residence of participants; therefore, this research could also be called “cross-national” research.

Researchers must be careful not to approach their research under the assumption that differences must exist between cultures or countries; one of the main goals of cross-cultural comparison is to study whether or not such differences exist so that the new knowledge can be tested and explained (Matsumoto, 2009; Al-Bannay et al., 2013). Globalisation through TV, internet and GSN technology is reducing differences between countries (Ryen, 2001; Cserni, 2019), so it may be that we see very little difference between behaviour in Connecticut and Merseyside. This study is approached with a neutral stance aiming to understand if there are differences between the two study sites, and if so, what are these differences.

As will be shown in this literature review most of the research on health and GSN apps in LGBTQ+ community has been conducted with MSM in the USA, China and Australia. We do not know if behaviour on GSN apps or health outcomes is similar in the UK. The only research identified in this literature review that compared GSN app use in two cultural contexts analysed Jack’d profiles to understand self-presentation in MSM in China and the USA (Chan, 2016). Comparing and contrasting patterns of use, motivations, health outcomes, health behaviour and risk reduction strategies will enable us to understand if the existing research from the USA can be applied in the UK. If behaviour and outcomes are similar, the existing research may not need to be replicated in the UK. Cross-cultural health research allows health managers and health promotion organisations to sensitively adapt ideas that have worked elsewhere and avoid other’s mistakes (Øvretveit, 1998). If we know MSM in the UK and USA use apps in similar ways we may be able to assume successful app interventions from the USA could be implemented in the UK; for example app based promotion of HIV and STI testing (Sun et al.,

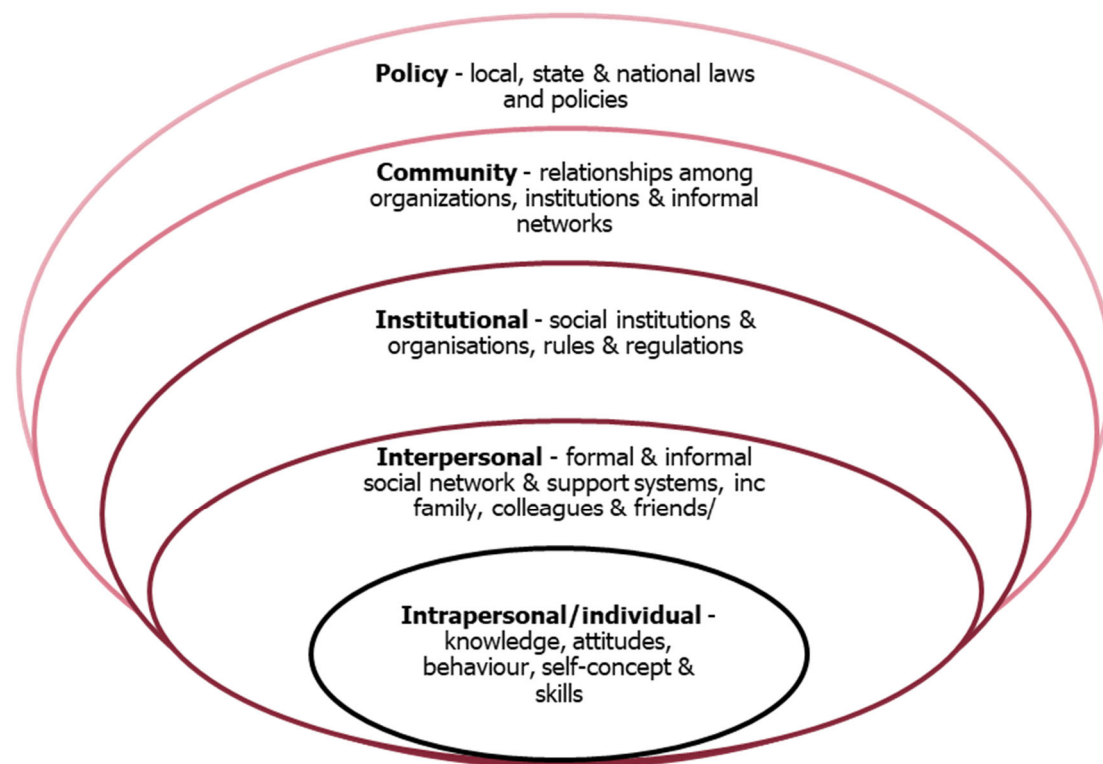


2015), distribution of HIV self-test kits on Grindr (Rosengren et al., 2016) and promotion of local public health services to MSM on Grindr (Lampkin et al., 2016).

### 2.3.2.2 Socio-ecological model of health

One of the fundamental purposes of this study is to examine culture and differences between health behaviour in two countries; therefore, a relevant theory of health behaviour must acknowledge external factors and societal influences, as well as individual differences. Building on the multilevel framework of human development suggested by Bronfenbrenner (1977), McLeroy et al (1988) proposed the socio-ecological model of health. The model examines the interrelations between environmental conditions and human behaviour and well-being, with the term “ecology” referring to the study of the relationships between organisms and their environments (Stokols, 1996).

*Figure 2.2: The socio-ecological model of health (adapted from McLeroy et al., 1988)*



McLeroy et al’s model shows five levels of influence on health behaviour, and possible intervention strategies at each level (figure 2.2; McLeroy et al., 1988; Golden and Earp, 2012). The five levels were; intrapersonal factors (e.g. and individual’s knowledge, attitudes, behaviour, self-concept, skills); interpersonal processes and primary groups (e.g. formal and informal social network and social support systems, including the family, colleagues and friends); institutional factors (e.g. social institutions and organisations, rules and regulations); community factors (e.g. relationships among organizations, institutions, and informal networks); and public policy/structural (e.g. local, state, and national laws and policies; McLeroy et al., 1988).

Ecological models of health assume the multiple levels are interactive, reinforcing and have influence on each other (Golden and Earp, 2012; Baral et al., 2013). Improving population health through effective interventions

needs researchers to consider both individual behaviour and the complex environments and systems in which they operate (Sallis, 2008; Sniehotta et al., 2017). A systems approach to public health aims to address all levels, from intrapersonal to public policy. However, the majority of research on health interventions focuses on individual and interpersonal characteristics, rather than institutional, community, or policy factors (Golden and Earp, 2012). There have been recent calls for a complex system approach that uses a broad range of methods to design, implement and evaluate interventions taking context into account (Rutter et al., 2017; Craig, 2018; Portela et al., 2019).

Socio-ecological models have been used to examine a variety of health behaviours relevant to this thesis including HIV risk behaviour (Baral et al., 2013; Gourlay et al., 2017), STI transmission (DiClemente et al., 2005), physical and sexual violence (Dahlberg and Krug, 2006), resilience in LGBTQ+ youth (Asakura, 2016) and sexual assault amongst sexual minority women (Logie et al., 2014). Bronfenbrenner's ecological model (1977) has recently been used to examine depression in younger Grindr users in California, using a quantitative approach. They found that gay community connection, experiences of homophobia, presence of an objecting network member and emotional support were found to be significant predictors of depression, and the authors recommend multilevel interventions to reduce homophobia in a youth's social contexts and improve coping skills and resilience (Gibbs and Rice, 2016).

There are many policy-level differences between the UK and the USA that the socio-ecological model acknowledges. Healthcare services and public health policy are hugely different; tax funded, free at point-of-access NHS in the UK compared to the USA private health insurance model, with limited state funded healthcare. The two areas also differ in relation to some protective legislation and LGB rights, though this is mainly at the national level; Connecticut was chosen as a comparison because of the similarity of state laws to the laws of the UK (discussed in section 1.4).

### **2.3.2.3 Social norms**

As part of the SEM it is clear those around us influence our behaviour; friends, wider community members and strangers can affect our actions and attitudes. *Social norms* refers to common standards set by a social group, either formal or informal, that influence how other members will behave (Reid et al., 2010). Social norms can motivate people to fit in with common behaviour to cement social bonds, as well as provide a heuristic for when presented with a novel or unclear social situation (Reid et al., 2010). However, we often misinterpret these norms and adapt behaviour inappropriately to fit in with inaccurate perceptions of those around us.

Social norms research initially focused on alcohol consumption, meta-analysis finding young people consistently over-estimated the alcohol use of their peers (Borsari and Carey, 2003). Incorrect perception of normative behaviour is associated with increased rates of said unhealthy behaviours thus interventions that provide more accurate information about true norms can produce positive changes in health behaviour (Reid et al., 2010; Tankard and Paluck, 2016). Perceptions of social norms also influences other risk-taking behaviour including sexual activity, timing of sexual debut, HIV testing, chemsex and contraception choice (Sieving et al., 2006; Potard et al., 2008; Madden et al., 2014; Ahmed et al., 2016).

Perceived social norms do not only influence behaviour in the physical world, but also in the digital world. Normative behaviour on Grindr focuses on sex-seeking (Licoppe et al., 2016), and has been described as a *coercive norm* pressuring users to focus on sex (Jaspal, 2017). Other social norms on apps have been shown to shape how people present themselves, perceive attractiveness, communicate with others, engage in condomless anal sex, build trust and make decisions about which potential partners they will meet (Albury and Byron, 2016; Davis et al., 2016; Goedel et al., 2017c; Filice et al., 2019; Numer et al., 2019). The global nature of GSN app technology and ubiquity of Grindr is influencing social norms in diverse countries and communities (Cserni, 2019). Understanding how people perceive norms, expectations and rules on apps will enable us to understand what influences health behaviour and how health promotion interventions can respond.

### 2.3.3 Sex positive research

Sexual pleasure remains a taboo topic in many cultures and religions and social norms can restrict how openly it is discussed (Hull, 2008). Despite the word “pleasure” being included in the World Health Organisation definition of sexual health (*...the possibility of having pleasurable and safe sexual experiences, free of coercion, discrimination and violence...* WHO (2006)) it is often overlooked in research on the topic. Sexual activity has been shown to improve physical and psychological wellbeing (Scott-Sheldon et al., 2010). However, research on sex in LGBTQ+ groups almost entirely focuses on negative elements such as HIV, STIs and sexual assault and public health and medical research rarely acknowledges positive benefits of sex or pleasure (Epstein and Mamo, 2017).

Recently there has been a call for a more sex-positive approach to public and sexual health research, shifting the focus away from dangers and preventing sex towards encouraging pleasurable and safe sexual experiences (Halpern, 2010; Tolman and McClelland, 2011; Harden, 2014; Porta, 2020). This is important in the context of the recent GSN technology for research to look at the assets and protective factors for LGBTQ+ people (Grov et al., 2014; European Centre for Disease Prevention and Control, 2015). However, discussion of Grindr tends to be negative, assuming it is dangerous or harmful negative (Woo, 2015). Research has also shown that MSM want health promotion messages on GSN apps that are sex positive and not too clinical (Kesten et al., 2019).

This thesis aims to understand not only risks and potential ill-health that can result from using GSN apps; it will also explore on the physical, social, emotional and sexual benefits of using GSN apps.

## 2.4 Literature review strategy

The remainder of this chapter uses the methodology of a critical review to present, analyse and synthesise the existing evidence on the link between GSN app use and LGB health. A critical review uses diverse sources and goes beyond mere description of the literature to include analysis and a conceptual innovation (Grant and Booth, 2009). In this case, the conceptual framework presented in section 2.9 develops a model for understanding the relationship between GSN app use and health amongst people seeing same-gender partners.

### 2.4.1 Search strategy - general LGBTQ+ literature

The first half of the review presents the background to the topic of this PhD (LGB health inequalities, factors protective to health and development of LGB dating) and, due to the size of this topic, seeks to identify the

most significant items in the field rather than review the whole evidence base (Grant and Booth, 2009). For each section the databases Medline, Web of Science, PsycINFO, Scopus and Sociological abstracts were searched with key terms, articles generally restricted to the year 2000 onwards and, if possible, UK and USA studies included. To ensure a general understanding of the literature was included, where possible, systematic reviews and meta-analysis were used. Grey literature from the UK and USA government were also reviewed, as well as research from large HIV, LGBTQ+ health and sexual health organisations in the UK and USA.

#### **2.4.2 Search strategy - GSN apps and LGB health**

GPS based social-sexual networking apps are a comparatively new technology; Grindr, the first app of the kind, was launched in 2009 (Grindr, 2017). Therefore, in early 2017 (when this PhD was started), their relationship with health was a relatively new area of research and the evidence base was limited. When this PhD was started two systematic reviews had been published on use of and health outcomes/risks of GSN apps (Choi et al., 2017; Zou and Fan, 2017)<sup>8</sup>. The maximum number of studies included in these systematic reviews was 17, and this included all studies irrespective of quality (Zou and Fan, 2017). These two reviews only identified research on MSM and focused on quantitative research, despite one aiming to include all LGBT people (Choi et al., 2017). Once this PhD had commenced, another integrative review was published (Queiroz et al., 2017), as well as a systematic review and meta-analysis of STIs in MSM users of GSN apps (Wang et al., 2018). Since this PhD proposal was approved, the number of papers examining health or behaviour on LGB GSN apps has almost doubled (papers published 2016 and earlier n=50, published 2017-2020 n=47; excluding research evaluating GSN app-based interventions).

This critical literature review was approached in a systematic way to ensure a comprehensive and unbiased discussion of the available evidence (Grant and Booth, 2009). CINAHL, Medline, Web of Science, PsycINFO, Scopus and Sociological abstracts were searched and papers restricted to 2009-date, to ensure only research relating to smartphone GSN apps were included. Search terms were developed from the three systematic reviews on the topic of GSN apps and LGBTQ+ populations (Choi et al., 2017; Queiroz et al., 2017; Zou and Fan, 2017). Search terms were also expanded to broader health issues, outcomes and impacts (e.g. alcohol, chemsex, depression, weight). Search terms were grouped into three categories; "GSN apps", "health outcomes" and "LGBT population" and combined using AND and OR and Boolean operators (see appendix K for search terms). Searches were updated in July 2020 to ensure the most up to date evidence was also included.

Abstracts were scanned and papers read in full if they focused on LGB persons, people who reported same-gender sexual partners or were from large general population surveys that broke down results by sexual orientation group. In total 97 papers were identified and read in full. Key findings were extracted from each paper and compiled onto a spreadsheet along with detailed information about methods, population, recruitment methods, apps included, country and limitations (an abridged version of this spreadsheet is included in appendix L). The findings from these 97 papers form the core of this literature review (section 2.8).

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<sup>8</sup> Both reviews available online in 2016, prior to print publication.

To stay up to date with research, citation alerts were set up for key papers, chosen to cover a range of systematic reviews and key topics in app research. These included the three reviews on MSM/LGBTQ+ GSN app use (Choi et al., 2017; Queiroz et al., 2017; Zou and Fan, 2017) and three key studies examining app use, risk and sex-seeking behaviour (one based in China and two in North America; Tang et al., 2016; Chan, 2017; Whitfield et al., 2017).

An additional qualitative study of Grindr users in the south of England was identified but must be viewed with caution (Ives, 2018). The research was published in a journal that does not peer-review papers and is not indexed in any of the main databases. There were also some limitations to the methodology. It is highlighted here because this study investigated sexual health and HIV knowledge and attitudes of young Grindr users, particularly social norms around risky sex and chemsex. They found users perceive the app to be highly sexualised but do not feel this directly influences their risky sexual behaviour. However, participants overestimated chemsex and other risky behaviour. The authors recommended a social norms approach to dispel any myths surrounding sexual behaviour.

## **2.5 Health inequalities and sexual orientation**

Health inequalities are well documented for the LGB population. In both the UK and the USA, and indeed globally, LGB people experience worse physical and mental health, have a poorer perception of their own health and exhibit more unhealthy behaviours than their heterosexual counterparts (Meyer, 2003; King et al., 2008; Institute of Medicine, 2011; Lick et al., 2013; Hudson-Sharp and Metcalf, 2016). Generally, bisexuals and other plurisexual people experience the worst health outcomes, compared to lesbian, gay or heterosexual people (Dilley et al., 2010; Colledge et al., 2015; Booker et al., 2017).

Lesbian, gay and bisexual people face high levels of discrimination and social stigma which contribute to health inequalities (Institute of Medicine, 2011; Zeeman et al., 2019), through the mechanism of minority stress (see section 2.3.1.1; Meyer, 2003; Lick et al., 2013). Health disparities are also exacerbated by social inequalities such as poor experiences of education, employment, housing and health services. LGBTQ+ persons are more likely to be homeless (The Albert Kennedy Trust, 2016; Morton, 2018) and face discrimination in employment, recruitment and promotion (Hudson-Sharp and Metcalf, 2016) which may lead to reduced income. LGBTQ+ people are also more likely to be dissatisfied with health services; mainly due to experiences of heteronormativity, discrimination and lack of information and/or staff knowledge on LGBTQ+ people's health (Institute of Medicine, 2011; Hudson-Sharp and Metcalf, 2016).

### **2.5.1 Mental wellbeing**

Although the majority of LGB persons are happy, well-adjusted and mentally healthy, they are significantly more likely to have worse mental health than their heterosexual counterparts (Meyer, 2003; Chakraborty et al., 2011; Institute of Medicine, 2011; Mercer et al., 2016).

#### **2.5.1.1 Mental ill-health**

An influential 2008 meta-analysis of international papers demonstrated suicide attempts to be twice as common, and depression and anxiety disorders to be 50% more common among LGB persons compared with

heterosexuals (King et al., 2008). A more recent systematic review included studies published up until 2014 and examined mental health of sexual minority groups separately. They also found elevated risks for depression, anxiety and suicide attempts or suicides for sexual minority men and women from many geographic regions, and these varied no matter how sexual orientation was measured (behaviour, attraction and identity; Plöderl and Tremblay, 2015). These disparities start in early life with LGB youth displaying higher rates of depression, more suicidal ideation, have more suicide attempts and are more at risk of completed suicide than heterosexual youth (Marshall et al., 2011; Yıldız, 2018).

Higher rates of mental ill-health, anxiety, suicide and PTSD may be caused or exacerbated by LGBTQ+ victimisation, heterosexism and stress (Roberts et al., 2010; Burton et al., 2013; Mustanski et al., 2016). The minority stress model argues the everyday stressors faced by LGBTQ+ people lead to increased incidence of mental ill-health (Meyer, 2003; Lick et al., 2013; Mink et al., 2014). Similar to the evidence on physical health, bisexuals are at even higher risk of mental ill-health, compared to gay, lesbian and heterosexual persons (Dilley et al., 2010; Colledge et al., 2015; Booker et al., 2017).

### **2.5.1.2 Body image**

Weight, body image and disordered eating varies by sexual orientation. In the UK, a recent large meta-analysis, pooling data on 93,429 adults from population health surveys, found sexual minority women are more likely to be overweight/obese than heterosexual women (40% increased risk for lesbians and 24% for bisexual women). However, gay men were at significantly lower risk of being overweight/obese (38% lower) compared to heterosexual men (Semlyen et al., 2020). Sexual minority men appear to be at particular risk of disordered eating and issues with body image. Non-heterosexual men report more symptoms of disordered eating than heterosexual men, including purging, fasting and diet pill use (Calzo et al., 2017). Gay men are slightly more vulnerable to body dissatisfaction than heterosexual men, though no differences were found between lesbian and heterosexual women (Morrison et al., 2004).

Increased body dissatisfaction and associated disorders in gay and bisexual men may be due to community norms about ideal appearance and the importance of physical attributes (Calzo et al., 2017). The minority stress model suggests disordered eating is a stress-induced response to victimisation, discrimination and internalised homonegativity (Calzo et al., 2017; Pachankis et al., 2020). Sexual and social competition within the gay community may provide additional pressure and stressors to conform to physical ideals (Pachankis et al., 2020).

### **2.5.2 Sexual health**

Health research with MSM has tended to focus on sexual health, HIV and STIs (Boehmer, 2002; Brennan et al., 2017), mainly due to the high prevalence of sexual ill-health in this group. MSM continue to report worse sexual health outcomes than men who have sex exclusively with women, including higher STI diagnosis rates, poor sexual function and experience of attempted non-consensual sex (Institute of Medicine, 2011; Mercer et al., 2016). Evidence on sexual health of WSW is limited and this population group tends to get overlooked in research (Rosser, 1993; Ellis, 2015). However, risk is not negligible and sex between women is a potential transmission route for most viral and bacterial STIs (Bailey et al., 2003; Gorgos and Marrazzo, 2011; Ellis, 2015).



Comprehensive STI and HIV data in the UK, by sexual orientation/risk group, are available from Public Health England (PHE). PHE collate nationally mandated data from all NHS specialist sexual health and non-specialist sexual and reproductive services, young people's services, pharmacies and other community-based services (Public Health England, 2019a). In the USA, the data are less robust and accurate national data are not readily available.

#### **2.5.2.1 HIV/AIDS**

HIV diagnoses in the UK are falling, a 32% decline over the last decade. Despite this, MSM remain the group highest risk of acquiring HIV with 51% of new cases in 2018 being diagnosed amongst gay, bisexual and other men who have sex with men (O'Halloran, 2019). However, the most noticeable reduction in diagnoses has been seen in this group; a 39% decrease between 2015 and 2018. This has been most evident in white men, UK-born men and those residing in London (Public Health England, 2019b). Recent reductions in HIV transmission, especially in MSM, have been attributed to a combination of prevention approaches including condom use, increased HIV testing, prompt drug treatment and availability of PrEP (O'Halloran, 2019). PrEP is discussed in more detail in section 2.6.2.

In the USA, MSM are also the population group most affected by HIV, accounting for 69% of all new HIV diagnoses in 2018 (Centers for Disease Control and Prevention, 2020). Unlike the UK, diagnoses have remained steady for the previous five years and are influenced by stigma, homophobia and discrimination. MSM are at higher risk for multiple health problems which can affect their opportunities to seek and receive high-quality healthcare, including HIV testing, treatment and prevention (Centers for Disease Control and Prevention, 2020). HIV rates are particularly high in black/African American and Hispanic/Latino MSM.

Sex between women is low risk for HIV transmission and it is generally assumed prevalence is very low amongst lesbian women. However, we cannot assume WSW have no risk for HIV as bisexual or plurisexual women, and some who identify as lesbian, will also have sex with men and some WSW may be at risk from routes of infection such as injecting drugs (Gorgos and Marrazzo, 2011; Ellis, 2015). However, lesbian and bisexual women are not included in official HIV statistics with neither recent national UK or USA HIV surveillance reports mentioning WSW (O'Halloran, 2019; Centers for Disease Control and Prevention, 2020)

#### **2.5.2.2 Sexually transmitted infections**

Comprehensive data on STI incidence by sexual orientation/risk group are available in the UK from PHE (Public Health England, 2019a), however the USA national STI data are less robust. The US data mainly come from incomplete monitoring and specific surveillance projects, not national epidemiological surveillance of clinics, and do not routinely collect gender of sex partners (Centers for Disease Control and Prevention, 2019).

MSM in England are one of the groups most at risk of being diagnosed with an STI, with large increases seen in chlamydia (61%), syphilis (61%) and gonorrhoea (43%) diagnoses between 2014 and 2018. These increases may be due to better detection of these STIs or behavioural changes such as an increase in partner numbers and condomless anal intercourse (Public Health England, 2019a). The PHE report also suggests these increases may be exacerbated, for some high risk MSM, by 'chemsex' and group sex linked to geosocial networking



applications. MSM from black, Asian and minority ethnic groups are at increased risk of STIs and HIV (Hickson et al., 2017b; King et al., 2018).

In the USA, MSM are also one of the groups at highest risk of STIs. Although the USA data may not be as robust, evidence shows STI incidence is high and increasing in MSM. This may reflect increased frequency of behaviour such as condomless anal sex, interconnectedness and concurrence of sex partners within MSM networks and possibly limited access to healthcare (Centers for Disease Control and Prevention, 2018). MSM are also more likely than men who have sex exclusively with women to have strains of gonorrhoea resistant to antibiotics (Centers for Disease Control and Prevention, 2019). In the US, health disparities among MSM reflect those observed in the general population, with higher incidence of STIs reported among racial minority and Hispanic MSM, young MSM and MSM of lower socioeconomic status (Centers for Disease Control and Prevention, 2018).

Data on STI incidence are limited for WSW. The STI reports from the CDC in the USA do not mention lesbians or WSW. The UK STI surveillance data reports have started to include information on WSW, although numbers are small. The most commonly diagnosed STI in WSW in 2018 was chlamydia, however the number (186) is substantially smaller than chlamydia diagnoses in heterosexual women (59,425; Public Health England, 2019a). This may be due to very low incidence, or it may be that women who report any sex with men are recorded as “heterosexual” or clinics are not yet routinely recording WSW status.

Although robust incidence data are rare, evidence on women’s sexual behaviour reveals they are at risk of many bacterial and viral STIs (Bailey et al., 2003; Gorgos and Marrazzo, 2011; Ellis, 2015). In the absence of surveillance data, some research shows STI rates are lower in lesbian women and higher in bisexual women (McNair, 2005; Lindley et al., 2013), however rates of self-reported lifetime STI diagnosis may be comparable to heterosexual women (McNair, 2005). Diagnoses of bacterial vaginosis may be higher in WSW (Gorgos and Marrazzo, 2011).

### **2.5.2.3 Sexual behaviour as risk factors**

Evidence consistently finds MSM have more sexual partners than heterosexual men; in the UK, the NATSAL-3 data showed the age standardised number of sexual partners (all genders) in the last five years for MSM was 15.8, compared to 3 for men who have sex with women (Mercer et al., 2016). Although number of sexual partners can be taken as a proxy for sexual risk, simple number of partners does not reveal anything about the type of sex or potential risk of STI or HIV transmission. Effective barrier methods and PrEP significantly reduce risk of sexual ill-health, irrespective of number of partners. Although research has attempted to quantify rates of condom use in MSM, not surprisingly the results are very mixed and vary between demographic groups, recruitment methods and geographical area. Measures are also inconsistent across studies; outcomes such as *any*, or *number of occasions*, of condomless anal intercourse (CAI) are measured over varying time-periods (e.g. 3, 6 or 12 months). Some research splits these into insertive (CIAI) or receptive (CRAI) as condomless sex poses a higher risk of HIV acquisition for a receptive partner (Baggaley et al., 2010).

Despite challenges in comparing CAI between studies, a systematic review of MSM in higher-income countries found increasing trends in CAI, CAI with an HIV-discordant partner, and a decreasing trend in number of

partners (Hess et al., 2017). However, this only included research published by 2013 and may now be out of date. Since 2013, PrEP has been rolled out in many countries, HIV diagnoses are decreasing in British MSM (O'Halloran, 2019) and app use has become more widespread.

Although STI and HIV rates are considerably lower in WSW than MSM and heterosexual women, behavioural data reveals WSW may still be at notable risk of sexual ill-health. Use of barrier methods during sex between women is not common, lesbians report higher rates of sex with bisexual men and bisexual women report more substance use with sex (Koh et al., 2005; McNair, 2005; Richters et al., 2010). Research from the UK and the USA has consistently shown WSW are not very concerned about contracting STIs (Bailey et al., 2003; Marrazzo et al., 2005). WSW may not feel at risk because they are rarely included in sexual health promotion, government policy and general conversations about sex (Power et al., 2009; Formby, 2011). Lesbians are also less likely to access STI or gynaecology services than heterosexual women (Gorgos and Marrazzo, 2011; Lindley et al., 2013). The lack of medical services for WSW is influenced by healthcare professionals' poor knowledge and the dearth of research on sexual health of WSW is likely caused, in part, by heterosexism (Rosser, 1993; McNair, 2005).

### **2.5.3 Substance use**

Evidence consistently shows LGB people are at higher risk of substance misuse, recreational drug use and drug dependence, than heterosexual people (King et al., 2008; Institute of Medicine, 2011; Mercer et al., 2016; Booker et al., 2017). Increased use of drugs has been linked to experiences of minority stress (Meyer, 2003; Lick et al., 2013).

Recent research has focused on the use of specific drugs linked to sex, specifically amongst MSM. The term "chemsex" is used to refer to this combining of sex and illicit drugs, typically mephedrone, GHB/GBL, and crystal methamphetamine (Ahmed et al., 2016). Chemsex drugs allow users to have more sex by increasing libido, confidence, disinhibition and stamina, and users report drugs enhance the quality of sex (Weatherburn et al., 2017). Estimates of chemsex prevalence in MSM varies, but appears to be particularly high in the UK with three English cities ranking highest in Europe for proportion of MSM using chemsex drugs on the last four weeks (Brighton (16%), Manchester (16%) and London (13%); Schmidt et al., 2016). Across the UK, rates of chemsex in the previous year vary between 10-20% in MSM in HIV negative men in London but are lower (6%) in general UK samples, and are significantly higher in HIV positive men (Schmidt et al., 2016; Hibbert et al., 2019a; Blomquist et al., 2020; Curtis et al., 2020). Qualitative research with gay men in London (both those who engaged in chemsex and those who did not) reveals they felt chemsex was extremely common amongst gay men in London, and in line with social norms theory, they overestimate the prevalence in their peers (Ahmed et al., 2016).

Men engaging in chemsex are more likely to report STI diagnoses, CAI and higher numbers of sexual partners (Lea et al., 2016; Schmidt et al., 2016; Glynn et al., 2018; Hibbert et al., 2019a; Blomquist et al., 2020; Curtis et al., 2020). This is particularly concerning as HIV testing and sexual health clinic attendance in this group is lower than national recommendations (Curtis et al., 2020). Although using drugs and alcohol at the time of sex is relatively common amongst WSW (17% of WSW completing a large UK sex and lifestyles survey), use of chemsex-associated drugs by WSW is very rare (<1%; Hibbert et al., 2019b).

The evidence on rates of alcohol use in sexual minority persons is inconclusive. The seminal King et al. (2008) systematic review on mental health in LGB groups found alcohol dependence was 50% higher in LGB people compared to heterosexuals, with rates especially high for WSW. However, a more recent large systematic review of papers published up until the end of 2014, examined a broader range of measures of alcohol use and found very mixed results; some studies showed increased, some decreased, and some similar alcohol use by LGB and heterosexual persons (Plöderl and Tremblay, 2015). These substantial inconsistencies between the studies appear to be influenced by how the alcohol use was measured and reported.

#### **2.5.4 Personal safety and violence**

Although acceptance of homosexuality and same-gender relationships is increasing in the UK and USA (Prah et al., 2014; Twenge et al., 2016), LGBTQ+ people still remain at higher risk of victimisation and violence. LGBTQ+ people are at greater risk of hate crimes compared to heterosexual people; gay men, young people and those from BME groups are at the highest risk (Institute of Medicine, 2011; Hudson-Sharp and Metcalf, 2016). A meta-analysis of victimisation in the USA<sup>9</sup> showed LGB individuals reported greater rates of victimization than heterosexual individuals, with only small differences between genders (Katz-Wise and Hyde, 2012). MSM are more likely to report non-volitional sex (sex against their will) than men who have sex with only women (Mercer et al., 2016), and non-heterosexuals have a greater risk of interpersonal violence than heterosexuals (Roberts et al., 2010; Katz-Wise and Hyde, 2012).

### **2.6 Factors protective to health**

Although much research focuses on ill-health and risk-taking behaviour in LGB populations, evidence is also mounting about which factors protect health, increase positive outcomes and can ameliorate some of the effects of minority stress.

#### **2.6.1 Social support, coping and resilience**

In the general population having social support and large social networks is linked to reduced all-cause mortality and lower risk of specific diseases such as cardiovascular disease and dementia (Berkman, 2000; Gruenewald and Seeman, 2010; Ikeda and Kawachi, 2010). Social support is thought to affect biological, behavioural or psychological processes, which in turns makes one less susceptible to illness (Gruenewald and Seeman, 2010).

For sexual minority groups, a connection to an LGBTQ+ community is also likely to have a positive impact on health. Social support and feeling part of the LGBTQ+ community is linked to better self-efficacy, lower depression symptomology, improved self-esteem and long-term health outcomes (Detrie and Lease, 2007; Heath and Mulligan, 2008; Doty et al., 2010; Gibbs and Rice, 2016). Those who are closeted and not open about their sexual identity, and thus less connected to a LGBTQ+ community, are more likely to report feelings of internalised homonegativity (IH). IH is the process whereby LGB persons internalise negative societal messages as part of their self-image, often unconsciously (Berg et al., 2016). IH, a key factor in minority stress theory, is linked to increased rates of physical and mental ill-health in LGB people (Meyer, 1995; Meyer, 2003;

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<sup>9</sup> 21 categories including sexual and physical violence and other crimes, harassment in workplace, school and on the internet as well victimisation by within the family

Lick et al., 2013; Mink et al., 2014). Internalised heterosexism is also associated with increased psychological distress (Puckett et al., 2015). Higher IH is associated with loneliness, and IH is lower in LGB people who have more close friendships and social support (Newcomb and Mustanski, 2010; Berg et al., 2015; Berg et al., 2016). Social cohesion and affiliation with an LGBTQ+ community may be a source of strength and provide opportunities for connection, social support, and coping, which can ameliorate the impact of stress (Meyer, 2003; Hill and Gunderson, 2015).

Coping skills and social support are key parts of resilience, which buffers the effects of stressors. Resilience is the quality of being able to survive and thrive in face of adversity - resilience suggests successful adaptation to cope with or withstand stress (Hill and Gunderson, 2015; Meyer, 2015). Resilience can be individual (e.g. feelings of helplessness or feelings of control, personality traits) or at a community level (e.g. resources that help individuals cope with stress and how communities further the capabilities of an individual; Meyer, 2015). Connections to community and positive LGB identity are also linked with resilience and are likely to lead to better health (Mink et al., 2014; Hill and Gunderson, 2015),

### **2.6.2 Pre-exposure prophylaxis (PrEP)**

Pre-exposure prophylaxis (PrEP), HIV medication taken as a precautionary measure before potential exposure, is effective at preventing HIV infection in MSM exposed to the virus through sexual transmission (Grant et al., 2010). Despite fears PrEP would reduce HIV rates but increase other sexual ill-health, this appears unlikely. Although PrEP users are likely to report CAI, there is no conclusive evidence that PrEP users increase their sexual risk behaviours or have more STI diagnoses (Freeborn and Portillo, 2018; Morgan et al., 2020).

Introduction of a PrEP programme for MSM in the UK would be cost-effective and potentially cost-saving in the long-term (Cambiano et al., 2018). In England, there are estimated 10,000 MSM eligible for PrEP (Mitchell et al., 2019), however, at the time of data collection, PrEP was not yet widely available on the NHS. MSM who wished to access free PrEP had to enrol on the national PrEP Impact Trial. The trial was over-subscribed with some clinics turning away potential users because they reached recruitment targets (originally 13,000 increased to 26,000 (The Lancet, 2019b)). The medication has also been available through other channels, including a website that has been credited in the media as preventing thousands of cases of HIV (de Castella, 2018). However, this route is only available to those who can afford it, potentially widening health inequalities. Most recent PHE HIV data in the UK credits an increase in PrEP use as one of the reasons for a 39% decrease in the number of HIV infections in MSM over the last 3 years (O'Halloran, 2019). In March 2020 the Department of Health announced routine commissioning of PrEP across England with the drug being widely available from April 2020 (BBC News, 2020). However, due to COVID-19, as of July 2020 it had still not been rolled out.

In the USA, an estimated 492,000 MSM would benefit from PrEP (Smith et al., 2015). Due to the privatised healthcare system in the US, PrEP is available through health insurance and in some states through drug assistance programs. There are significant disparities in PrEP coverage with users more likely to be white, more educated, have higher household incomes and have health insurance (Finlayson et al., 2019). Highest uptake has been seen in large metropolitan areas like San Francisco and New York City, with the lowest PrEP coverage in the Southern USA, despite high burden of the disease in the south (Siegler et al., 2020; Sullivan et al., 2020).

Despite policies to increase access to free PrEP medication in the USA, it is still falling very short of demand and prohibitively expensive (approx. \$13,000 per person per year), leading to calls for more competition in the US market (The Lancet, 2019a). The cost of PrEP in the US is more than twice that of the £4,008 per person per year in the UK (approx. \$5,000 in June 2020; Cambiano et al., 2018). A recent international scoping review of PrEP use in MSM found cost, stigma and geography are barriers to uptake. Increasing uptake of PrEP requires diverse referral routes and services that can offer PrEP to MSM and healthcare environments free from stigma (Hillis et al., 2020).

## **2.7 Background to lesbian, gay and bisexual dating/sex-seeking**

The inequalities, homophobia, heterosexism and discrimination discussed in the previous section are not new. Historically, the LGBTQ+ community has been hidden and stigmatised and needed to use novel methods to meet each other. From underground illegal gay bars, clandestine sex in public toilets and personal ads in print press, for a long time finding sexual partners, friends and lovers was legally risky for persons (Bolton et al., 1994; Evans, 2017; Stevenson, 2017; Ackroyd, 2018). Although sex between women was never illegal in the UK, historically lesbians and other WSW have been more hidden with fewer ways to meet lovers and form communities (Ackroyd, 2018). Globally, 68 countries criminalise consensual same-sex sexual acts, with 12 countries still having the death penalty in law (Mendos, 2019).

Sex between men was partly decriminalised in the UK in 1967 (Ackroyd, 2018) and in parts of the USA in the early 1970s (including CT). However, it was not until a supreme court decision in 2003 that sex acts between two men were decriminalised across the whole of the USA (Weinmeyer, 2014). Following state decriminalisation, the flourishing of the gay pride movement and increased social acceptance of same-sex relationships increased avenues for meeting partners (Ackroyd, 2018). Through the 1970s and 80s bars, nightclubs, cafés, saunas, telephone chat lines, social clubs and personal ads in gay and mainstream print media all provided potential ways to meet other LGB people. In the 1990s, developments in computing opened up a completely new way of social interaction. New technologies are often adopted for sex; telephones for phone sex, video players and handheld camera for professional and amateur pornography and text messaging for sexting. The internet added many other options including chatrooms, video chatting, exchanging nude photos and videos, cybersex, dating and escorts (Leiblum, 1997; Grov et al., 2014).

MSM have been early adopters of such technologies, embracing phone sex lines, early internet chatrooms and socio-sexual networking websites, social media and now smartphone apps, to seek sexual and romantic partners (Liau et al., 2006; Rosser et al., 2011). However, there has been little research or academic discussion of how WSW have adapted to changes in technology.

### **2.7.1 Internet dating and health**

Sex-seeking online and sexual risk behaviour were common in MSM before the invention of GPS-based apps such as Grindr (Liau et al., 2006; Lewnard and Berrang-Ford, 2014). As a precursor to apps, with many of the same principles it can be assumed that behaviour on internet sites is likely to be similar to how people use smartphone apps. As is common throughout this literature review, there is a dearth of evidence on how women

used the internet to meet other women for sex or relationships. The evidence base on internet dating and sex-seeking online again focused on MSM.

### **2.7.1.1 Internet dating and MSM**

The modernisation and availability of the internet revolutionised the way people, especially MSM, developed community and connected with sex partners. Initially mainly text based, the internet of the 1990s provided opportunities for personal ads and chatrooms (Grov et al., 2014). Communicating with other people via the internet was particularly attractive to those who were not “out” and were nervous of using in-person venues like gay bars, clubs, saunas or cruising sites (Grov et al., 2014). In the early 2000s the proportion of young MSM meeting their first sexual partner online, as opposed to in an offline gay venue, increased; by 2002 61% of young MSM in the UK met their first sexual partner online (Bolding et al., 2007). However, the public health implications of the new technologies were identified relatively early on. Some MSM were using chatrooms to arrange to meet for “bareback” sex (CAI) and outbreaks of specific STIs were linked to gay chatrooms in specific geographical areas (e.g. an outbreak of syphilis in San Francisco in 1999; Klausner et al., 2000; Rosser et al., 2011; Grov et al., 2014).

Even before the GPS-enabled apps such as Grindr and Tinder, seeking sex online was common amongst MSM and those who did reported higher sexual risk-taking behaviour (Liau et al., 2006; Lewnard and Berrang-Ford, 2014). A meta-analysis of 14 studies from Europe and the USA in 2006 examined prevalence of risky sex among MSM. They found that 40% of MSM recruited in offline community settings had used the internet to look for sex partners. Those who sought partners online were 68% more likely to report CAI than those who did not (Liau et al., 2006). These findings were confirmed in a meta-analysis in 2013 (after the popularisation of Grindr but when websites were still very popular) that showed higher odds of CAI in internet-initiated sexual encounters compared to offline-initiated encounters (OR=1.24; Lewnard and Berrang-Ford, 2014).

MSM who used the internet to find sexual partners also had higher numbers of partners or reported only casual and no serious partner (Kim et al., 2001; Benotsch et al., 2002). A large USA study, using the 2006 USA National HIV Behavioral Surveillance system data, examined the number of casual sexual partners of MSM who used gay chatrooms. They found a dose response with non-users reporting a median of 2.6 casual male partners in the previous 12 months, compared to those using chatrooms several times a day reporting 6.3 casual male partners (Rosenberg et al., 2011). This study recruited all participants in offline spaces; however the focus of recruitment was bars, clubs and social organisations frequented by MSM in large USA cities. This may have included younger, metropolitan or more “out” MSM, which may not be fully representative sample of those who used the internet.

### **2.7.1.2 Internet dating and WSW**

There was often no distinction made between internet dating and smartphone apps in studies from the early 2010s. Many studies from this time just ask participants about “internet” or “online” dating, which covers any website or app. This is especially the case for the very limited evidence base on women, as little research looked at women and internet dating/sex-seeking prior to the 2010s. No research appears to have examined specific sexual risk for WSW who used the internet to meet sexual partners; for example, number of partners or sex acts and potential STI transmission.



The only research on internet use by WSW groups together desktop and mobile technology and finds that WSW are more likely to meet partners online than heterosexual women, however, use of internet/apps is much lower in WSW compared to MSM. One of the few large UK studies on WSW and online dating/sex-seeking used data from the nationally representative probability study NATSAL-3 data to examine if people report finding sexual partners on the internet (Cabecinha et al., 2017). Women who identified as gay or lesbian were nearly three times more likely, and those who identified as bisexual four times more likely, than heterosexual women to seek partners on the internet. Seeking sexual partners on the internet was significantly higher for men. Compared to heterosexual men gay men were 11 times more likely, and bisexual men 6 times more likely, to have reported finding sexual partners online. The data for this round of the NATSAL was collected in 2010-12, just as smartphone GSN apps were becoming popular, so the authors acknowledge their data might underestimate the public health significance of meeting partners online or on apps. This research also did not ask about the sex they had with people they met online, just if they looked for partners online.

Another study including WSW and grouping websites and apps together analysed data from the 2012-2013 Second Australian Study of Health and Relationships, a nationally representative telephone survey of Australian adults. They investigated the proportion of people who had sex with someone they met on an internet site or a smartphone app in the previous year. Lesbian, gay or other sexual minority women were more than twice as likely as heterosexual women to have had sex with someone they met on a website or app in the last year. Again, internet/app sex-seeking was substantially higher in men. Homosexual, bisexual or other sexual minority men were over 15 times more likely than heterosexual men to have had sex with someone they met on a website or app in the last year (Watchirs Smith et al., 2018).

### **2.7.2 Development of GSN apps for lesbians, gays and bisexuals**

Grindr was first launched in 2009 (Grindr, 2017) and uptake was fast amongst gay and bisexual men. As early as 12-24 months after its introduction, 29% of young MSM in Los Angeles reported all or most of their gay friends used Grindr (Landovitz et al., 2013) and a 31% of MSM in gay venues in Denver had used an GSN app themselves (Whitfield et al., 2017).

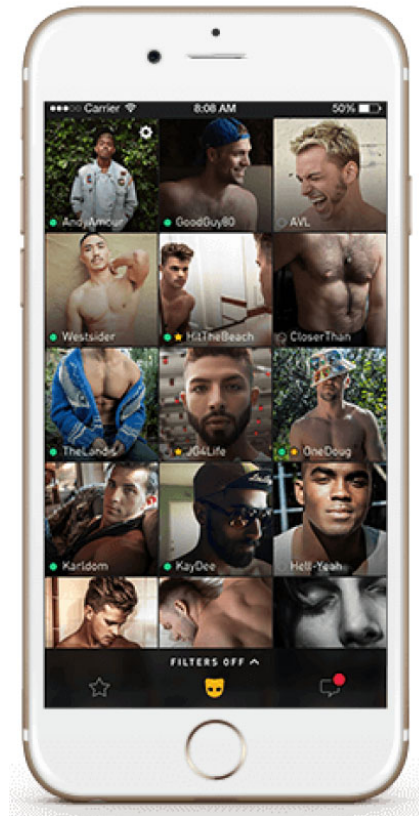
One of the main differences in the technology is the GPS feature of apps such as Grindr. The websites of the 2000s and early 2010s (e.g. Gaydar, Gaydar Girls, Planet Romeo, Adam4Adam, Craigslist, Plenty of Fish) did allow users to search for potential partners within specific geographical areas, for example either a town/city or within a certain number of miles of a specific postcode/zip code. The geographical location is a key factor for many of the smartphone apps developed since 2009. User profiles can often be sorted by distance or may show the distance of another user in feet, metres or miles. Grindr (and Scruff and Jack'd) display potential partners in order proximity, showing those who are nearest and online first – effectively sorting by availability and convenience (see figure 2.3 for illustration of a user's Grindr home screen).

Other apps quickly followed, each having a slightly different audience, design, focus or unique selling point. Some of the most enduringly popular apps amongst LGB users are Scruff (launched 2010), Jack'd (2010), Tinder (2012), and HER (originally launched under the name Dattch in 2013). Some of the original dating and sex-seeking websites also developed apps which their users could use alongside, or instead of, the desktop website.



The most popular of these websites to apps included Plenty of Fish (website launched in 2013 and app in 2010), OKCupid (website started in 2004 and app added in 2012) and Match (website launched in 1995 and app in 2014; See appendix A for a brief overview of each app).

*Figure 2.3: Grindr user's home screen, displaying users in distance of proximity (Grindr, 2017)*



Early research with young MSM (data collection in 2011, less than two years after Grindr was launched) showed they were using GSN apps and dating websites for the same reasons (Holloway et al., 2014b), suggesting they were seeking the same outcomes but moving onto new technology. However, the development of smartphone apps did not just change the tool people use to access information but also changed the way people behave. A study using data from one large dating website (name withheld, though it appears to be a general site not LGBTQ+ specific) found that when users shifted from the website to the smartphone app they initiated contact with a broader range of potential partners, visited significantly more profiles, sent significantly more messages, and achieved more matches (Jung et al., 2019). For male users (though not specifically MSM) using the app also made them more impulsive as they were less likely to check the profile of a user who messaged them before replying. Although the research on internet dating and sex-seeking online may be transferrable to apps, the technology of apps is fundamentally different to the websites used on laptops or desktop computers, and appears to influence behaviour in a different way.

## 2.8 Geosocial networking apps and health

As discussed in section 2.7.1, MSM and WSW are more likely than heterosexuals to have had sex with someone they met online (either on a GSN app or website; Cabecinha et al., 2017; Watchirs Smith et al., 2018). Very little research has compared app use between different sexual orientation groups or between genders.

Recent research focusing on just GSN apps has also found that LGB persons (of all genders) and those who report same-sex sexual partners are more likely to have used a GSN app in the previous two months than heterosexual persons (Rogge et al., 2020). Not only is use higher, moreover, non-heterosexuals also report more risk-taking behaviour when they do use apps. This recent large USA study included 3,180 participants, and oversampled LGB people to allow robust comparisons. They found that, compared to other app users, those who report same-sex partners in the last twelve months were more likely to have reported having had a hook-up in the last 2 months, ever having had a hook-up involving alcohol or drugs, having had condomless sex in the last 2 month, having had three or more sex partners in the last year, and having had at least one STI (Rogge et al., 2020). However, they do not present these data by gender, only presenting findings for all people who had a same-sex partner. This masks differences in behaviour of MSM compared to WSW.

### 2.8.1 Women who have sex with women, GSN apps and health

Although women (usually white, young and heterosexual) are often the focus of research on technology and sex, lesbians and other WSW are rarely included in research on “risky” online sexual environments (Rosser, 1993; Albury and Byron, 2016). The overwhelming majority of research on geosocial networking apps has focused on MSM or heterosexual persons. Of the 97 papers identified for this section of the literature review, only two focused on WSW, one grouped MSM and WSW together and all three papers were qualitative research. Due to the small number of studies these will be discussed in turn.

A study from New Zealand interviewed eight bisexual women about their experiences of using Tinder (Pond and Farvid, 2017). They asked about women’s sexuality, experiences of dating on Tinder, GSN apps and online dating sites. Much of the discussions focused on self-presentation and identity rather than explicitly health. Women in this study found Tinder to be superficial and focused on physical appearance; they experienced biphobia (from gay Tinder users), homophobia (from heterosexual users), as well as catfishing, deception and stalking by men. Women felt it was their responsibility to stay safe and reported ways they tried to do so including being more cautious of men, arranging to meet in public spaces and telling friends where they were going. However, this was a very small study with no questions asking specifically about health.

Another paper reported findings of two qualitative interview studies recruiting WSW in Australia (n=8), UK (n=17) and Canada (n=2), again concentrating on Tinder use (Ferris and Duguay, 2020). This paper focuses on identity and how users navigated online spaces. They found women intentionally constructed their Tinder profile to signal their queer identity and deter men and couples looking for threesomes. Although this study recruited participants across three countries, there was no justification for the international element and no cross-cultural comparisons were made, leaving the reader questioning why this was done.

An additional study reported findings on focus groups about safety and risk on “hook-up apps” with a mix of young MSM and WSW in Australia (aged 18-29; Albury and Byron, 2016). However, this study did not discuss or compare findings separately for gender groups. Sexual health risk was not a key issue for the young men and women in these focus groups; they were concerned about sexual harassment, unwanted sex, being outed, deception, sexual predators and sharing of their pictures without permission. Participants reported some rules and personal codes of conduct to keep safe including relying on a user’s pictures to understand others and maintain security, not giving out personal information like phone numbers and keeping all communication within the app. However, the focus groups were part of an online safety course at an HIV charity and did not ask specifically about participants’ personal experiences. It is also unclear if their suggested rules to stay safe were what they already did or what they had learnt on the course. This study also focused on “hook-up” apps and there are no widely used apps aimed facilitating hook-ups or casual sex for WSW. There is no “Grindr for lesbians”, so it is likely the experiences differed between men and women in this study but this was not discussed.

This review demonstrated there is almost no research on health impacts of GSN apps for WSW, and the only research from the UK is combined with Canada and Australia and mainly examines identity and how women construct their Tinder profiles. There is also no qualitative research with WSW in the USA.

## **2.8.2 Men who have sex with men, GSN apps and health**

Given Grindr effectively started the GSN app revolution and MSM have higher rate of STIs, HIV and sexualised drug use, it is not surprising the majority of research has focused on MSM. Of the 97 studies of GSN app use by LGB persons (or with a large enough sample size to compare groups based on sexual orientation), reviewed for this chapter, 87 focused solely on MSM. The findings from this research is synthesised below to identify key findings and gaps.

The majority of the original research studies focusing on MSM (n=88) came from the USA (n=47), China (including Hong Kong, n=9) and some from Australia and New Zealand (n=4). A handful of studies come from other European countries (including France, Denmark and Sweden, and Ireland; n=4), other countries in Asia (India n=1 and Thailand n=1) and Brazil (n=2). Ten studies came from the UK, five qualitative, four quantitative and one epidemiological report investigating a link between a syphilis outbreak and GSN apps. The remaining journal articles were either discussion or review papers or did not specify a country.

### **2.8.2.1 Patterns of app use by MSM**

Prevalence of GSN app use varies between studies, areas and groups. A systematic review of 14 studies published before mid-2015 (12 from USA,) found 31-36% of MSM had ever used GSN apps (Zou and Fan, 2017). More recent US studies have found higher proportions of MSM using GSN apps than this figure. Smartphone use increased dramatically, and apps are becoming part of everyday culture; increases in GSN app use would also be expected given the longer a technology is available the more people will try it. In general samples of MSM, 50-60% have ever used GSN apps (Badal, 2018; Sun et al., 2018), with higher rates in young MSM (between 53-70%; Macapagal et al., 2018; Macapagal et al., 2019), and higher again in young black MSM (76%; Duncan et al., 2018b).

Globally the use of GSN apps by MSM has increased rapidly. In Australia the proportion of MSM who reported using smartphone apps to meet sex partners nearly doubled between 2011 and 2014 (24-43%; Hull et al., 2016) and in one region of China the proportion of MSM using apps rose from 13% in 2015, to 53% in 2017 (Wei et al., 2019b). Other countries report higher rates of app use by MSM; 64% in Brazil (Queiroz et al., 2019b), 66% India (Rhoton et al., 2016), 73% in Thailand (Boonchutima and Kongchan, 2017). In Europe, prevalence of GSN use is as high as 89% in Paris (Dangerfield et al., 2020), and 65% in Ireland (O'Connor et al., 2018). The only UK study that has examined prevalence of app use found 44% of young MSM in Wales, Northern Ireland, Scotland and Republic of Ireland frequently used apps (Lorimer et al., 2016). However, this study could not get approval to recruit in England and these data were collected in 2012-13. Given the dramatic increases in other countries; this 44% is likely to underestimate the proportion of British MSM using apps in 2020.

Globally, Grindr is the most widely used app, with between 51-78% of MSM GSN app users ever using it (Lehmiller and Iorger, 2014; Beymer et al., 2016; Badal, 2018; Chan et al., 2018; Macapagal et al., 2018). However, Grindr is not as popular in all groups or countries. For young black MSM in the USA Jack'd appears to be more popular; 70% used Jack'd and only 36% had ever used Grindr (Duncan et al., 2018b). Jack'd and Grindr are also the most popular apps in Hong Kong (Yeo and Ng, 2016) and Hornet and Jack'd the most popular in Thailand (Boonchutima and Kongchan, 2017). However, Grindr use is very low in China (3.5%; Bien et al., 2015), with Blued being the most widely used Chinese app (Hong et al., 2017; Wei et al., 2019b).

Using only one app is rare with many MSM reporting using two or more apps concurrently, including Grindr, Tinder, Scruff and Hornet, among others (Bien et al., 2015; Rhoton et al., 2016; Duncan et al., 2018b; Macapagal et al., 2019). Multiple app use is especially common in rural and less densely populated areas where the number of other users is limited (Schipani-McLaughlin et al., 2017). It is also possible apps are used for different purposes and if profiles vary between apps (e.g. requesting or stating different outcomes, sexual position, testing info) this could have implications for health promotion and prevention (Rhoton et al., 2016).

Earlier research tended to compare behaviour of GSN app users against behaviour of non-users; indeed the Zou and Fan (2017) systematic review excluded research that did not have a non-app using comparison group. However, as recent evidence suggests GSN app use has become near ubiquitous amongst MSM, these comparisons become less meaningful. These apps are now part of the everyday lives of most gay and bisexual men. If you are a man looking for a male sexual partner it is likely you will use one of these apps at some point. The majority of people not using apps are likely to be those not looking for new sexual partners.

### **2.8.2.3 Motivations for using GSN apps**

Not long after Grindr was launched, MSM were using it for very similar reasons they used dating websites; at least two thirds of people reported using both apps and websites to make friends, find sex partners, dating and killing time (Holloway et al., 2014b; data collected in 2011). Despite the literature tending to focus on sexual health, when studies do ask about reasons for using GSN apps, desired outcomes are rarely solely sex-seeking.

There appear to be five or six main reasons men use GSN apps to meet other men; sex is only one of them. Studies vary on the relative importance of each motivation, depending on demographics, recruitment method and geography. These other reasons include; friendship and platonic social relationships; entertainment and

“killing time” or using when bored; romantic relationships, love or looking for a boyfriend; casual dating or non-serious romantic relationships; connection to a gay community and networking; and psychological and social inclusion such as reducing loneliness or self-esteem boosts (Rice et al., 2012; Holloway et al., 2014b; Phillips et al., 2014; Van De Wiele and Tong, 2014; Goedel and Duncan, 2015; Jaspal, 2017; Hahn et al., 2018; Queiroz et al., 2019a).

A Grindr user’s profile will usually include information about what they are “looking for”, with up to six available choices. This informs other users what they might be interested in, guides who to connect with or informs conversations. In 2018, Chu et al. (2019) reviewed the publicly available profiles of 3,744 Grindr users in the largest 50 metropolitan areas of the USA. Although 40% of users stated they were looking for *right now* (the option that implies casual or immediate sex), the most common option was *friends* (42%) and a third were looking for *dates* (33%) or *chats* (32%). The least common options were *relationship* (23%) and *networking* (18%; Chu et al., 2019). This information is at odds with the research agenda, which assumes the focus of GSN apps is sex-seeking. However, this data does come from public user profiles and there may be some social desirability at play. Original motivations for app use also may not match outcomes as a third of GSN app-using men in one USA study reported a casual sexual encounter on an app had developed into a romantic relationship (Lehmiller and Ioeberger, 2014). Motivations for use are likely to vary between cultures: Chan (2016) coded text from Jack’d profiles in USA and China and found American users were more likely to state they were looking for friends, whereas a higher proportion of Chinese men stated they were looking for relationships. Whatever the intended outcome, men in small cities and in rural areas of the UK and USA report needing to use GSN apps as it is harder to find a gay community or options of men to date; they might be more hidden or there are fewer physical spaces to meet men (Davis et al., 2016; Schipani-McLaughlin et al., 2017; White Hughto et al., 2017; Lauckner et al., 2019).

Despite the most common reason to use GSN apps being stated as non-sexual, interviews with MSM in the UK showed those who are looking for something other than sex thought there must be “something wrong with them” as they are not fitting in with the sex-seeking focus of apps (Jaspal, 2017). This over-focus on sex was also reported in interviews with Grindr users in France, who, despite some reporting making friends via Grindr, also talked about Grindr being like a “meat-market”. For some of these French participants, making friends with someone through Grindr was the exception that proved the rule (Licoppe et al., 2016). Social norms theory might suggest that these users are misinterpreting the intentions of other app users and adjusting their behaviour accordingly (Reid et al., 2010).

### **2.8.2.2 Sexual behaviour and apps**

The majority of research on GSN apps and MSM has focused on risky sex and sexual health outcomes. A systematic review of earlier research comparing GSN app-using MSM against non-users found mixed results in relation to numbers of sexual partners; three studies found app users had more partners and one study found app users had fewer partners (Choi et al., 2017). Number of partners is not a definitive measure of risk; crude number of partners does not tell us anything about the type of sex or potential risk of STI or HIV transmission. A better indicator of sexual risk with MSM is condom use. CAI increases risk for HIV and STI transmission for

both partners. Most research on STI or HIV diagnosis tends to be self-reported, although some studies have included STI/HIV tests, or recruited in STI clinics and linked responses to test results (e.g. Beymer et al., 2014; Chan et al., 2018; Wei et al., 2019a).

Earlier evidence comparing users against non-users showed inconsistent results regarding condom use. For example, although many studies reported high rates of CAI by app users, not all differed significantly from that reported by non-apps users and some studies showed rates of CAI were actually lower with app-partners than partners met elsewhere (Rice et al., 2012; Zou and Fan, 2017; Bonilla-Zorita et al., 2020).

Measures of condom use are not constant which makes comparisons difficult; different timeframes are used (3, 6 or 12 months); definitions of “inconsistent condom use” can be not using a condom one time out of multiple sexual encounters, or it could be reporting they “rarely” use condoms. Some studies do not state how they define “inconsistent” (Yeo and Ng, 2016). General rates of CAI by GSN app users varied between 17% reporting CAI with their last app partner (Holloway et al., 2015) to between 37%-67% reporting CAI with any partner in the last 3 months (Grosskopf et al., 2014; Bien et al., 2015). Tang et al. (2016) found app users in China were 1.5 times more likely than non-app users to have engaged in CAI in the last 6 months. Limited qualitative research with app users reveals some MSM make conscious decisions about CAI and are more likely to engage in “bareback” sex with regular partners who they trust (Numer et al., 2019).

Evidence on frequency or duration of app-use and association with CAI also appears inconsistent. In the UK young MSM who have used apps for longer are more likely to report CAI (Lorimer et al., 2016), though Chinese MSM who use apps more frequently report lower rates of CAI (Luo et al., 2019). The way people present themselves on apps is also associated with risk; users with naked torsos or visible abs on their Grindr or Jack’d profile are more likely to report CAI (Winetrobe et al., 2014; Yeo and Fung, 2016).

Not surprisingly, CAI is associated with increased odds of STI diagnosis in app users (O'Connor et al., 2018), and two meta-analysis shows app users are more likely to self-report a gonorrhoea or chlamydia diagnosis than non-users (Zou and Fan, 2017; Wang et al., 2018). However, a meta-analysis showed that GNN app-using MSM are no more likely to be HIV positive than non-users (Wang et al., 2018). Some evidence suggests GSN app users are more likely than non-users to engage in specific sexual acts such as oro-anal sex (rimming) and using saliva as lubricant, both of which increase the risk of transmitting gonorrhoea (Chow et al., 2018). CAI is particularly concerning when not accompanied by HIV/STI testing; for example a third of MSM app users in New York City who have never had an HIV test reported CAI in the previous 3 months (Rendina et al., 2014). Encouragingly, the Zou and Fan (2017) meta-analysis showed app-users are more than twice as likely to report lifetime HIV testing compared to non-app using MSM. However, testing is lower than recommended in this sexually active population. In a recent large study in the UK, 56% of MSM recruited through GSN apps had had an STI test in the last 12 months and only 37% had been to a sexual health clinic (Blomquist et al., 2020).

### **Does GSN app use lead to an increase in sexual risk?**

In a recent systematic review of “problematic use” of GSN apps and dating websites by people of all genders and sexual orientations, Bonilla-Zorita et al. (2020) found higher sensation seeking and sexual permissiveness



were associated with using GSN apps/websites to find casual partners. However, all the studies they included were cross-sectional and they recommended longitudinal studies to investigate change over time.

Probably due to the high proportion of MSM using apps, recent quantitative research has moved away from comparing GSN app-users and non-users, to trying to understand types of app-users and risks associated with patterns of use. As such a large proportion of MSM use GSN apps, it appears to be more complicated than simply concluding *GSN app use equals risk*. All the surveys described in this literature review so far have been cross-sectional so cannot attribute cause and effect. It is therefore unclear whether using apps increases sexual risk behaviour (for example using apps leads to more sexual partners) or whether those who would exhibit higher levels of sexual risk anyway are more likely to use GSN apps. One early study with Grindr users in Los Angeles did ask how participants felt Grindr had changed the types of sexual partners they had - only 22% said they have more sexual partners since they started using Grindr, whereas 45% said their partners now live closer and 44% said apps made partners easier to meet (Landovitz et al., 2013).

Dangerfield et al. (2020) used latent class analysis to investigate if sexual risk amongst MSM in Paris was associated with partner-seeking venues; comparing GSN app users and non-users was unhelpful as 90% of their respondents used apps to find partners. They identified three latent classes: Multi-venue Users (e.g. users of gay bars and clubs, saunas, internet chat sites *and* GSN apps; 19% of respondents); Serosorting<sup>10</sup> App Users (32%); and Standard Non-serosorting App Users (49%). Standard (non-serosorting) app users were the largest group and less likely to report any CAI in the previous 3 months (5% report CIAI and 9% CRAI), than those who use multiple venues to find sex partners (64% CIAI and 73% CRAI) or serosorting app users (63% CIAI and 70% CRAI). Dangerfield et al. (2020) conclude that app use itself was not an indicator of risk, it was near universal in this study. Using multiple venues to find sexual partners was associated with most risk (including CAI, group sex and sex tourism).

This adds to evidence from earlier research comparing black and Hispanic/Latino MSM in the USA who used *both* GSN apps and websites against those who used *only* apps or *only* websites (Allen et al., 2017; data collected 2011-2013). Men who used *both* avenues to find sex partners were more than twice as likely to report STI diagnosis in the previous 12 months, even when controlling for number of sexual partners. DeVost et al. (2018) also found that meeting sexual partners through GSN apps alone was not a proxy for sexual risk. Their study with MSM in a Los Angeles STI clinic found a nuanced relationship between STI incidence and meeting partners on apps, but they did find a dose-response relationship between the number of venues used to meet partners and testing positive for any STI.

These three studies build on evidence from before apps (Kerr et al., 2015) which suggest it is the number of avenues used and intensity of sex-seeking that is linked to sexual risk – GSN apps themselves do not inherently expose users to STIs or increase the chance of CAI.

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<sup>10</sup> Serosorting is choosing to have CAI with people of same HIV status. In the Dangerfield et al. (2020) study participants were asked: 'In the past 3 months, did you ever practice anal intercourse without a condom, having previously asked your partner if he was of the same HIV status as you, in order to prevent HIV infection?' Yes or No.



#### 2.8.2.4 Other health outcomes and risky behaviours on GSN apps

Although most research with GSN app-using MSM has focused on sexual health, some is starting to focus on other health outcomes; albeit the majority are risk or ill-health related.

##### Drugs and alcohol

Reviews of early research comparing GSN app-using MSM and non-users consistently reported higher use of recreational drugs and alcohol by app users (Queiroz et al., 2017; Zou and Fan, 2017). One study has also shown higher rates of smoking in app users compared to non-users (Sun et al., 2018). In the recently published large US study, app users who report same-gender sexual partners in the last year are more likely to report a hook-up involving drugs or alcohol than heterosexual app users (Rogge et al., 2020).

Understanding the relationship between substance use and apps is important because international research has shown a consistent association between drugs and/or alcohol and sexual risk-taking (Colfax et al., 2004; Hirshfield et al., 2004; Koblin et al., 2006; Heidinger et al., 2015). App users who use drugs and alcohol appear to take more risks with their sexual health. Amongst Grindr and Jack'd users, those who report drug and alcohol use are more likely to engage in CAI in both New York City and Hong Kong (Goedel and Duncan, 2016; Yeo and Ng, 2016). Research with app-using men in the USA found amongst those who engage in group sex, the use of drugs before or during sex was associated with a three-fold increase in CAI, however, alcohol use before or during sex lowered chance of CAI (Phillips et al., 2015).

A recent systematic review of sexualised drug use and chemsex on MSM social networking apps (SNA; including GSN apps and internet-based platforms) reported 15 studies found social networking apps users were more likely to engage in sexualised drug use, and there was a mutually reinforcing interplay between using apps and engaging in sexualised drug use. They suggest social networking applications provide an "*expedient platform for the invention, reinforcement and circulation of sexualised drug use identities, practices, and networks*". (Patten et al., 2020, p.119). However, they also identified five studies that showed higher rates of sexualised drug use by MSM connecting through non-app routes. The review found widespread evidence that social networking apps were used to purchase drugs and to organise chemsex parties.

Research regarding rates of chemsex in app users is limited. In older Brazilian MSM who use GSN apps, 12% reported chemsex in the last 30 days (Queiroz et al., 2019b) and in a recent large study of MSM in England, chemsex in the last year was lower (9%) in men recruited through GSN apps than men recruited through sexual health clinics (19%; Blomquist et al., 2020). PrEP use and drug use are also associated. Similar to evidence about the general MSM population in the UK (Hibbert et al., 2020), app-using men in London who are on PrEP are more likely to report recent drug use than those not on PrEP (Goedel et al., 2017a). Qualitative research with gay men in London (both those who engaged in chemsex and those who did not) revealed apps were used to facilitate sex parties and increase access to chemsex (Ahmed et al., 2016).

##### Mental health and body image

Very little research with GSN app users has examined their association with or impact on mental health. One early study with MSM in Washington DC found GSN app users were more likely to report depressive symptoms than non-users (Phillips et al., 2014). Amongst young Grindr users in California, depression was higher in those

who had experienced homophobia in their lifetimes, even when controlling for current social contextual factors, and connection to gay community was associated with lower depression symptomology (Gibbs and Rice, 2016). However, both studies collected data not long after GSN apps were launched and as usage has become more commonplace it is unclear if these findings are valid.

Very limited research has looked at apps and body image or self-esteem. Research in Atlanta, Georgia, identified Grindr users who were obese had higher body dissatisfaction, lower sexual sensation seeking, and fewer sexual partners (Goedel et al., 2017b). However, this study did not examine any associations between these outcomes and the app itself.

Qualitative interviews with Grindr users in the USA has suggested the app impacts on a user's body image in a unique way with complex interaction of technology, user, and environment (Filice et al., 2019). Their participants described how the anonymous nature of Grindr meant users were disinhibited (less civil in online interactions than they would be in person). The text on profiles and search functions of the app also contributed to weight stigma and encouraged sexual objectification. Many participants also reported comparing their appearance to that of other users negatively affected their body image. The authors conclude proactive factors such as self-esteem, social support and resilience can ameliorate these effects (Filice et al., 2019). Grindr users with higher BMIs are also less likely to have a profile picture showing their torso (Fitzpatrick et al., 2015).

However, impacts on body image might not be unique to GSN apps and may be associated with all social media. A large study with MSM recruited through one GSN app (presumably Grindr) in Australia and New Zealand, found associations between social media use and body image concerns and eating disorder symptoms; these associations were strongest for Facebook, Instagram, and Snapchat, rather than GSN apps (Griffiths et al., 2018).

### **Racism, discrimination, harassment and violence**

Witnessing or experiencing racism seems to be a common experience on GSN apps used by MSM. Expressing a preference for white sexual partners or explicit statements such as "no Asians" had been identified in quantitative and qualitative research with app-using MSM in many contexts including rural South-western USA (Lauckner et al., 2019), Australia (Callander et al., 2016; Thai, 2020), Denmark (Shield, 2018) and Canada (Numer et al., 2019). Although Grindr users tend to have sex with people who share the same racial/ethnic identification as themselves (Salamanca et al., 2019), "personal preference" is often used by men in online spaces to excuse potentially discriminatory behaviour (Wade and Harper, 2020) with the internet allowing a space to openly disclose racist remarks but not see them as racist (Robinson, 2015). However, irrespective of the manner it is expressed such preferences can be categorised as *racialised sexual discrimination*, which have a negative impact on the health of BAME users. Racialised sexual discrimination is defined as "*the sexualized discriminatory treatment that gay and bisexual men of colour encounter in online partner-seeking venues*" such as apps and websites (Wade and Harper, 2020, p.2). Experience of race-based sexual discrimination is associated with lower self-esteem and lower life satisfaction in BAME Grindr users (Thai, 2020) and correlated with depression, anxiety, and stress in a general sample of men of colour who have sex with men (Bhambhani et al., 2020)

As well as racism, qualitative research has identified widespread experiences of discrimination, harassment, insults or bullying on apps. In one study in rural USA, many participants had witnessed discriminatory statements on app profiles such as “no fats, no femmes”. Half of the men they interviewed had experienced deception or catfishing on apps (Lauckner et al., 2019). This research painted a very bleak picture of apps and the men who use them. However, the researchers did focus on risks and not any benefits, so it is not surprising they report such negative outcomes. Some of these experiences were echoed by Grindr users in Canada who also reported experiences of body shaming (Numer et al., 2019)

Although research is very limited on the prevalence, many MSM report being concerned about physical safety, violence or sexual coercion perpetrated by people they meet on GSN apps (Miller, 2015; Albury and Byron, 2016; Macapagal et al., 2016; White Hughto et al., 2017; Lauckner et al., 2019). There have been cases of violence, robbery and murders linked to MSM GSN apps (Simmons, 2016; BBC News, 2019), but the extent of the problem is under researched, with only extreme cases likely to be reported to the police or in the media. In one study with Grindr users in NYC, 38% had experienced at least one type of intimate partner violence (IPV) in their lifetime, with emotional IPV the most commonly reported form (42%). Experience of IPV was associated with higher CAI and sexual IPV was associated with an increase in substance use in the last month (Duncan et al., 2018a). This research only recruited men through Grindr and did not investigate links between IPV and the actual app itself. Nevertheless, the authors suggest the apps could potentially place MSM at additional risk of IPV as they facilitate emotional and/or physically intimate relationships.

#### **2.8.2.5 Staying safe on GSN apps**

The literature is limited on the strategies MSM use to stay safe on GSN apps and tends to focus on measuring negative health outcomes and experiences of use. Harm reduction public health approaches are strategies directed at individuals or populations to reduce the negative health outcomes and harms associated with risky behaviour (Leslie, 2008). PrEP is the main harm reduction behaviour studied in GSN app users.

#### **PrEP use and GSN apps**

Grindr gives users the option to state on their profile if they are taking PrEP and some people are more likely to be on PrEP than others. Recent research in the USA has found patterns and disparities of PrEP use amongst Grindr users is similar to national estimates (Siegler et al., 2020; Sullivan et al., 2020). Chu et al. (2019) extracted data from 2,744 Grindr profiles in the 50 largest metropolitan areas of the USA and found 18% of profiles reported using PrEP. Users aged under 24 were 50% less likely, obese users 50% less likely, black users 40% less likely and MSM in the South 30% less likely to report PrEP on their profiles. However, their methodology categorised people who had chosen to put no information about PrEP as non-users. Due to the considerable stigma associated with PrEP use (Thomann et al., 2018; Hammack et al., 2019), these results may underestimate uptake amongst Grindr users as some will feel uncomfortable to disclose PrEP use on their profile. This study excluded rural areas where uptake may be even lower.

Awareness of PrEP is high amongst GSN app-using MSM; 88% of app-users in London, 86% in New York City, and 77% of in Atlanta, Georgia, were aware of PrEP (Goedel et al., 2016a; Goedel et al., 2016b; Goedel et al., 2017a). Amongst GSN app users, self-reported PrEP user was higher in the UK (27% in London) than in the

USA (12% in NYC and 9% in Atlanta; Goedel et al., 2016a; Goedel et al., 2016b; Goedel et al., 2017a). These papers imply the participants were Grindr users but they do not explicitly state which app was used for recruitment – presumably because Grindr became very wary of their name being linked to negative health outcomes (see reflection box 4.3). The London, Georgia and NYC research collected data in 2016, and PrEP use has increased since then, especially in the UK since the national PrEP Impact Trial (The Lancet, 2019b)

Use of PrEP is associated with risk in GSN app users, indicating those most in need of PrEP may be more likely to choose to take it. In Paris, MSM who use multiple venues to seek sex partners (saunas, bars, clubs, internet chat sites and GSN apps) were more likely to be on PrEP (Dangerfield et al., 2020). In the UK, GSN app users who report recent use of club drugs are more likely to take PrEP and those who perceive themselves to be at lower risk of acquiring HIV are less likely to take PrEP (Goedel et al., 2017a; Goedel et al., 2019).

### **Staying healthy and safe on apps**

Although there is now sizeable evidence about health outcomes and sexual risk behaviour of GSN app-using MSM (especially in the USA and China), there is still a dearth of research on the way users make decisions about how to stay safe on apps or strategies they use to avoid negative health outcomes. There has been some limited qualitative research with MSM in North America (including MSM in rural South-eastern USA (Lauckner et al., 2019), Grindr users in Nova Scotia, Canada (Numer et al., 2019) and young black Jack'd users in Washington DC (Smiley et al., 2020)) and young MSM and WSW in Australia (Albury and Byron, 2016). However, harm reduction appears to have been only a small part of these interviews. The limited qualitative interview studies in the UK have focused on how people construct their profiles, identity formation and masculinity (Davis et al., 2016; MacKee, 2016; Bonner-Thompson, 2017; Jaspal, 2017; Miles, 2017), rather than on health-related behaviour or harm reduction strategies.

General lack of trust and scepticism of other app users was a common theme in qualitative research. Careful examination of photos and profile text was thought to reduce risk and increase trust; app users report avoiding profiles without face photos and exchanging multiple photographs before meeting (Albury and Byron, 2016; White Hughto et al., 2017; Lauckner et al., 2019; Numer et al., 2019). Arranging to meet men from apps in public, rather than in a private residence, was suggested as a strategy by some men to reduce the chance of violence (Lauckner et al., 2019). The young black Jack'd users in Smiley et al. (2020)'s interviews discussed not trusting the HIV status or testing information provided on other user profiles.

Further research before meeting up was a common strategy to stay safe, with GSN users reporting searching for potential partners on social media channels or Google and moving the conversation onto video chat or text messaging, away from the GSN app itself (Lauckner et al., 2019; Numer et al., 2019). However, young MSM and WSW in Australia actually preferred to keep communication within app and did not give out phone numbers to people they had not met (Albury and Byron, 2016).

### **Health promotion and safety advice on Grindr**

Perhaps responding to users' concerns and negative media coverage, Grindr recently released a "holistic safety guide" (Grindr for Equality, 2019). This 20-page guide includes advice, scenarios, and checklists and explicitly

mentions the public health harm reduction approach<sup>11</sup> (figure 2.4). The guide covers digital safety, personal safety and self-care and wellbeing, mainly focusing on security and safety rather than health (see below). Much of the guide is designed for app users in countries where homosexuality is illegal or being exposed would be potentially dangerous – a population entirely absent in the evidence base. This guide was released after data collection for this was completed so could not be discussed with participants. Although it is available on the community section of the app, is unclear how much this section is utilised and how many users will read this guide.

Figure 2.4: Introduction to the Grindr Holistic Security Guide (Grindr for Equality, 2019)

## **GRINDR HOLISTIC SECURITY GUIDE**

Safety is not merely the responsibility of users, and Grindr is continuously seeking to develop and improve its security features—not only to protect users, but also to provide them with critical safety information needed to ensure a safe experience.

As part of these ongoing efforts, Grindr for Equality has partnered with LGBTIQ+ and health activists and organizations around the world—as well as our users—on a **Holistic Security Guide** that encompasses multiple areas of user safety. Thanks to their invaluable feedback and advice, we're now able to share this important information to help users enjoy their Grindr experience while staying safe.



This guide will follow the harm reduction approach, so everyone can continue using Grindr with raised awareness about how to reduce the harm that may come to us. Harm reduction is an approach from public health. It is designed to lessen the negative social and/or physical consequences associated with various human behaviors, while recognizing the inherent risk in some everyday activities.

2

Grindr also has a website ([KindrGrindr.com](http://KindrGrindr.com)), which contains videos of users sharing their experiences of sexual racism, body shaming, transphobia, HIV stigma and femme shaming (Kindr Grindr, 2018). The website aims to

<sup>11</sup> Originally developed to reduce the potential harms of illegal drug use, as opposed to total abstinence, the term *harm reduction* is now used across wider public health to refer to strategies directed at individuals or populations to reduce the negative health outcomes and harms associated with risky behaviour (Leslie, 2008).

"take steps towards a kinder, more respectful community" and reduce discrimination on the app; however, it is unclear of the impacts of this website.

### Topics covered in the Grindr Holistic Security Guide

#### Digital Security

- Don't Post Pictures with Identifiable Features
- Meet in A Safe Location
- Don't Use Personal Info in Your Grindr Profile
- Don't Connect Your Social Media Accounts
- Chat Sessions are Saved on Both Phones (Yours & Theirs)
- Avoid Browsing Online via Wi-Fi Hotspot
- Always Update Your Phone's Software
- Enable Remote Wipe for Your Smartphone
- Protect the Photos and Videos on Your Phone
- Secure Your Grindr App with A PIN
- Hide Distance in Your Grindr Profile
- Hide from Explore Searches

#### Personal Safety

- Do A Background Check on Your Date
- Meet First in A Safe Public Space
- Let A Friend Know Where You're Meeting
- Clear Phone When Meeting Strangers
- Avoid Excessive Alcohol and Drug Use
- If You Get Arrested

#### Self-care & well-being

- Nurture Your Support Systems
- Take Care of Your Mind and Body
- Take Care of Your Body
- Take Care of Your Sexual Health
- Your Body Is Yours
- Collective Community Support
- Our Differences Make Us Unique

*(Grindr for Equality, 2019)*

### 2.8.3 GSN apps and health interventions

As well as providing socio-sexual networking, GSN apps are a potential route for delivery of health promotion and interventions. Computer based interventions are effective for learning about sexual health. A Cochrane Review found interactive computer interventions can improve self-efficacy, safe sex intentions and sexual behaviours (Bailey et al., 2010). It is likely that much of this evidence, which was based on desktop, laptop or tablets, is transferable to smartphones. With developing technology, new trials are testing online and app-based health interventions and promotion to reduce risk behaviour and ill-health in LGB populations. Most of this has focused on sexual health and HIV with MSM (Rosser et al., 2011), with no evidence available about health promotion aimed at WSW.

A recent systematic review of online interventions (including internet, smartphone, and web 2.0) suggested this technology provides opportunities for providing real-time assessment and feedback, gamification and virtual reality; with some eHealth interventions being effective in the short term for increasing HIV testing and reducing risk behaviour (Muessig et al., 2015). Research with GSN app-using MSM show they would be interested in sexual health features within GSN apps, specifically help finding LGBTQ+ health providers, receiving lab results, chatting to healthcare providers and appointment reminders (Holloway et al., 2014b; Sun et al., 2015; Ventuneac et al., 2018). Sexual health promotion through GSN apps was thought to be particularly useful for younger MSM who may not know where to look for information or who may not be as accustomed to risk reduction strategies (Kesten et al., 2019).

The GPS facility of GSN apps allows targeted promotion at users within a specific geographical area. Some sexual health, LGBTQ+ or HIV organisations already engage in outreach work on apps by creating a profile and talking to app users. A study on a MSM GSN app in North Carolina showed a quarter of informational chats with a health educator on an app led to the users requesting and being referred to a HIV/STI testing site (Sun et al., 2015). In a study in suburban/rural California, users found health educator advice via Grindr to be acceptable and led to an increase in uptake of local testing services (Lampkin et al., 2016). One of the Connecticut HIV/LGBTQ+ health charities that supported recruitment and provided informal advice for this PhD has profiles on a number of MSM GSN apps. Their outreach workers interact with local GSN app users and provide advice, sexual health information and signposting. However, there may be some ethical challenges with outreach on apps including difficulties managing personal and professional boundaries with clients, disclosing personal identifiable information to clients and maintaining client confidentiality and anonymity (Fantus et al., 2017).

The other way GSN apps have been used is by public health organisations and charities purchasing banner and pop-up ads on specific apps. Theoretically adverts could deliver safer sex messages or provide information about local health and HIV/STI testing facilities. The published research has tended to focus on evaluations of adverts to increase HIV testing, perhaps because this is an easily measurable outcome. Two studies with black and Latino Grindr users in Los Angeles have found using Grindr banner adverts to promote free HIV testing is feasible and acceptable to users and led to high uptake of free HIV tests (Huang et al., 2016a; Rosengren et al., 2016). Success of advertising campaigns varies; adverts containing male figures (with or without faces) were more effective than plain text ads (Grov et al., 2020) and MSM want adverts to be sex positive, not too clinical and focused on building positive sexual health norms (Kesten et al., 2019).

Sexual health content is rare on GSN apps, though more common on apps aimed at MSM (Huang et al., 2016b). In the UK, health professionals working with MSM are calling on apps to take more responsibility for sexual health and reducing HIV risk (Kirby and Thornber-Dunwell, 2015). Some of the GSN apps do offer reduced advertising fees for health promotion, although other apps have been criticised for being unwilling to engage with health issues focusing solely to facilitating unprotected sex (Kirby and Thornber-Dunwell, 2015). In China the biggest GSN app, Blued, appears to work closely with researchers to understand the sexual behaviour and health needs of their users (some of the authors of a paper on app use and CAI are listed as affiliated with the company that owns Blued; Luo et al., 2019).

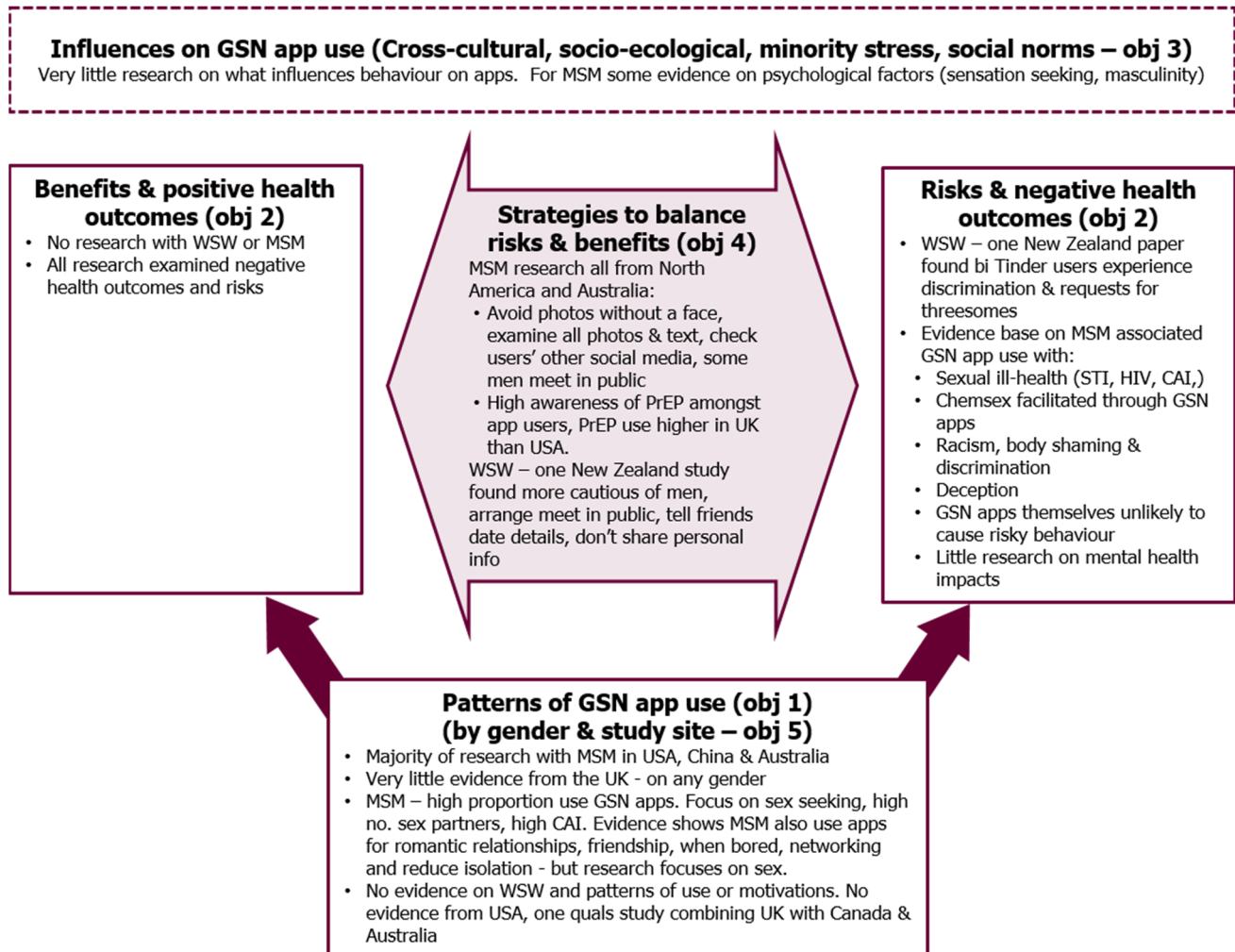
However, there is still a lack of research examining long term impacts or large-scale efficacy and few studies examine linkage to care, retention in care, and initiation of antiretroviral therapy (Muessig et al., 2015). A study is about to start in Hong Kong recruiting MSM through GSN apps and social media, community organisations, and universities. HIV is on the increase in Hong Kong, especially in MSM, and has been linked to an increase in use of GSN apps by MSM. Their two-armed randomised controlled trial RCT will test a web-based interactive online intervention promoting condom use and HIV/STI testing and aiming to reduce chemsex and group sex. Their intervention is based on the theory of planned behaviour and they plan to follow up participants for 6 months (Choi et al., 2020).



## 2.9 Conceptual framework

A conceptual framework was developed after reviewing the literature (figure 2.5). Such frameworks give coherence to research by detailing connections between theoretical perspectives, research objectives and the evidence (Bloomberg and Volpe, 2012). This conceptual framework includes the key evidence identified in this literature review and sets out how this thesis will approach the relationship between research objectives.

*Figure 2.5: Conceptual framework for this thesis, highlighting key findings and gaps in literature (research objective number)*



At the bottom of the diagram are the patterns of use of GSN apps, which will be investigated by gender and study site (objective 1). On either side of the model are the potential health outcomes of GSN app use (objective 2). These risks and potential negative health outcomes have been studied in MSM: evidence shows those who use GSN apps exhibit sexual risk-taking behaviour, are exposed to chemsex and experience racism, body shaming, discrimination and deception on apps. There is very limited evidence about health outcomes for WSW. There is effectively no research about positive health outcomes and benefits of GSN app use for any genders (left hand box).

In the middle, balancing the health outcomes are the strategies people employ when using GSN apps to maximise benefits and reduce risk (objective 4). The evidence on these strategies or rules is also limited, with some limited North American and Australasian evidence showing MSM and WSW take measures to establish reliability of profile information, keep safe when meeting in person or reducing sexual risk with PrEP. Overarching the top of the model are the potential influences on GSN app use and health of LGB people (objective 3) including factors across cultures, the socio-ecological model of health (McLeroy et al., 1988), minority stress theory (Meyer, 1995) and social norms (Reid et al., 2010). Developing a conceptual framework is an iterative process (Bloomberg and Volpe, 2012) and the framework is revisited and updated with the key findings of this thesis (section 9.1).

## **2.10 Gaps in the literature**

The UK Government is currently developing a new national sexual health strategy and highlighted that GSN apps are changing trends in sexual behaviour (House of Commons, 2019). The US Department of Health and Human Services has also stated more research is needed on LGBTQ+ health, resilience and wellbeing (US Department of Health and Human Services, 2016). Fully understanding all health outcomes and behaviour is important to ensure policy reflects current behaviour.

The conceptual framework (figure 2.5) reveals some substantial gaps in the literature. The three reviews of GSN app use and the review of “problematic online dating” (Choi et al., 2017; Queiroz et al., 2017; Zou and Fan, 2017; Bonilla-Zorita et al., 2020) were also re-examined to understand any further gaps they had identified. These reviews identified the need for research using robust sampling frameworks, rather than convenience samples; the commercial Facebook advertising of the survey (section 4.3) is an attempt to overcome this methodological flaw. Although longitudinal studies are needed to investigate causal relationships between behaviour and health outcomes, the nature of a PhD means this is not feasible within the three year timeframe. The systematic reviews of GSN app use by MSM identified a need for more quantitative European studies, and although some have been published since (Lorimer et al., 2016; O'Connor et al., 2018; Dangerfield et al., 2020), none of these are in England. The need for mixed methods research and combining self-reported health and in-depth interviews was also identified. UK based and mixed methods research will be addressed by this PhD.

Therefore, this literature review has identified five main gaps in the literature on GSN apps and health that will be addressed in the primary research.

### **1) Influences on health**

The evidence base demonstrates the substantial impacts of personal, social, environmental and cultural factors on general LGBTQ+ health and on behaviour. Use of GSN apps has only been examined in relation to specific behaviours or personality/psychological factors. Examining health behaviour through the lens of the socio-ecological model of health, minority stress theory and social norms will provide fuller understanding of behaviour.

### **2) Women who have sex with women and GSN apps**

The vast majority of evidence has examined GSN app use by MSM, either because it assumes WSW are not at risk or are not using apps. However, WSW were more likely to meet partners online or on apps than heterosexual

women. The limited research with WSW has found they were concerned about many similar issues as MSM, such as safety, mental health, harassment, deception and discrimination. Although WSW might not have as many negative sexual health outcomes as MSM, understanding other health outcomes is important.

### **3) Positive health impacts**

In line with general public health research and the history of LGBTQ+ research, the focus has been on risk, ill-health and danger. Sex positive research advocates for rejecting deficit models and negative associations with sex. Public health can be very pessimistic, implying all sex, alcohol and fun is dangerous. People will continue to use GSN apps; understanding the positive health outcomes and how they might improve mental health (e.g. “make people happy”!) is important if people are going to be encouraged to use them safely. To be effective, health promotion needs to be based on a full understanding of a health behaviour.

### **4) Health protective behaviours**

Linking to the above issue about positive health impacts, it is important to examine what makes people thrive, how resilience could be increased and how people can stay safe. The limited qualitative research has found GSN app users already take precautions to stay safe and healthy. Successful behaviour change and health promotion needs to build on existing health protective behaviours; understanding existing strategies can inform health promotion.

### **5) UK-based research**

The majority of the research on GSN apps and health has been conducted in North America (mainly the USA), China (including Hong Kong) and a minority in Australia and other European countries. The very limited research from the UK has focused exclusively on MSM and again only examined sexual health. The UK evidence is also mainly qualitative and focuses more on identity and is sociological rather than health focused. Cross-cultural mixed methods research that compares outcomes and experiences between the UK and USA would allow us to understand if the increasing body of American evidence is applicable in the UK.

## Chapter Three | General Methodology

This chapter provides an overview of the methodology of this thesis. It starts with an examination of paradigms and philosophical approaches to research, explaining my position as a pragmatist and how this links with the chosen methods. The mixed methods approach is discussed and the sequence and focus of each study explain. This chapter also includes a discussion of the population of study and how labels and identity influence the focus of public health research. The ethical considerations of both studies are also discussed in this chapter. The detailed methods of the cross-sectional online survey (study one) are explained in detail in chapter 4 and the photo elicitation interview methods (study two) in chapter 6.

### 3.1 Philosophical approaches to research

#### 3.1.1 Paradigms

First introduced as a term by Kuhn in the 1960s, *paradigms* are much-debated concept in the social sciences (Morgan, 2007). Paradigms essentially guide researchers by providing a set of principles and rules for conducting research. The worldview of a researcher allows them to define reality and truth (ontology) and know what is real and true (epistemology; Jacobsen, 2016). There have been a number of paradigms described over the years and each differs “*in terms of how they express the nature of reality, what methods are considered appropriate for investigating this reality and why research should be undertaken in the first place*” (Tolley et al., 2016; pg 18).

Post-positivism, often associated with quantitative methods, makes claims for knowledge based on observation of causes and outcomes with the aim of developing laws and theories. This approach relies on logical inferences and testing theories using careful measurement and observation (Creswell and Plano Clark, 2011; Bloomberg and Volpe, 2012). The interpretivist paradigm (sometimes referred to as social constructionism) is often associated with qualitative methods and views the world as socially constructed. This approach views reality as subjective and multiple that can be experienced from different perspectives (Tolley et al., 2016). Maxwell and Loomis argue there are not uniform, generic qualitative and quantitative research paradigms but claim that each paradigm is made up of various distinct components and there is disagreement over the use, nature and implications of some of these components (Maxwell and Loomis, 2002).

It is generally accepted that there is not one universal approach that is best for all research topics (Karasz and Singelis, 2009; Bloomberg and Volpe, 2012). Researchers must appropriately match the research method and approach to each question they approach. Within mixed methods research a paradigm is “*usually seen as incorporating a “package” of ontological and epistemological understanding, with epistemology in particular having potential implications for methodology*” (Bazeley, 2018, p.14).

#### 3.1.2 Pragmatism

Johnson and Onwuegbuzie (2004) argue that mixed method research can be seen as the third research movement that moved past the “paradigm wars” and offers a logical and practical alternative. Pragmatism is the key philosophical partner for mixed method research (Tashakkori and Teddlie, 2003; Creswell and Plano Clark, 2006). Pragmatism is based on the philosophical theories of John Dewey (1859-1952) who stated that

inquiry, and thus research, begins with a problematic situation that needs to be addressed through action (Morgan, 2014a; Morgan, 2014b). Modern approaches to pragmatism build on Dewey's ideas to help breakdown the alleged epistemological hierarchies between the different methods involved in MMR (mixed methods research; Biesta, 2010). A pragmatic researcher places primary importance on the problem or the research question and uses "what works" to guide methodology (Creswell et al., 2011; Bloomberg and Volpe, 2012; Shannon-Baker, 2016). The goal of research is solve problems or produce an outcome, not focus on the theories of processes that guide it (Jacobsen, 2016).

### **Reflection box 3.1: Paradigms and my view of the world**

I first came across paradigms during my MSc in Public Health at LJMU. I wrote an essay, which I definitely misremember being titled "which paradigm is better?". I recall reading about the paradigm wars and being incredulous that anyone genuinely believed one approach was "better". Surely everyone could see it depended on your research question?!

My BSc in Psychology did not even recognise there were different approaches to knowledge. My degree sat squarely in the positivist sciences; there was no examination of our worldview or epistemological approach, something I have come to realise is the case in most hard sciences. However, we did cover social psychology and history of psychology. We looked at peoples' experiences and acknowledged, though maybe not explicitly, that every person has a different perspective on the world. We also had research training in qualitative methods and I was always most interested in the social psychology or health psychology - psychometrics always felt a little made up to me (don't tell my Business Psychologist best-friend!)

I have always equally enjoyed playing with big datasets (study 1) and chatting to people (study 2). My research career started in epidemiology and then moved to applied health research. I worked for an NHS R&D department and most of my work over the last five years has been evaluating health programmes and conducting needs assessments. As an applied researcher, I have always been more interested in how the results of research can be used to improve services than in the any philosophical debates. Discovering the term "pragmatism" felt like such a natural realisation – "oh I do have an official label for the way I approach research". Although I slightly envy my friends in the hard sciences who are able to write a thesis with little deliberation over their theoretical or philosophical framework, I have become more self-aware, acknowledging my approach to research and why I enjoy MMR.

Dividing the quants and quals sections of this study was relatively easy. I knew if I wanted to understand sexual behaviour, how people make decisions and how they mitigate risk I needed to have long, in-depth personal conversations with people in the LGBTQ+ community. I wanted to understand how each person's individual experience shaped their reality and how this influenced their health. To understand if patterns of app use was similar between groups I needed to measure and quantify behaviour.

However, pragmatism has been criticised due to its vague methodologies that do not provide guidelines on how to integrate quantitative and qualitative methodologies (Hall, 2013). To overcome this criticism a formal triangulation framework (Farmer et al., 2006) will be used to integrate the findings of this mixed methods research. Being a pragmatic researcher is vital to answer the research objectives of this thesis. The survey, using a post-positivist approach, described differences in behaviour between groups. Although this phase was not testing a hypothesis, the survey instrument aimed to quantify behaviour and understand relationships between variables. The survey used objective measures that can then be generalised to the wider population

(Morgan, 2007; Creswell et al., 2011; Tolley et al., 2016). The second phase of the research, the qualitative interviews, approaches knowledge from a constructivist paradigm. Each interview aims to understand the participant's own interpretation and experience of the world; their interaction with GSN apps and app partners is subjective and will vary by participants. This phase of the research was "bottom up"; it was inductive and informed by the data and brought together individual perspectives into broad patterns, and ultimately, into a general understanding (Morgan, 2007; Creswell and Plano Clark, 2011; Braun and Clarke, 2014; Jacobsen, 2016).

### 3.2 Mixed methods research

Mixed methods research came to prominence in the 1980s with the coining of the term and discussion of how to combine and link quantitative and qualitative methodologies (Creswell and Plano Clark, 2011; Padgett, 2012). There are many definitions for mixed methods research. Johnson et al. (2007) gathered 19 separate definitions from leading mixed methods researchers and authors and synthesised a finite definition from these. They define MMR as combining "*elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration*" (Johnson et al., 2007; pg 123). Their definition is appropriate for this thesis as these methods have been designed to provide a depth of understanding and the triangulation (chapter 8) uses the Farmer et al. (2006) framework to corroborate the findings.

#### 3.2.1 Why mixed methods research?

As discussed in section 3.1.2, the research objectives of this PhD thesis call for a pragmatic approach and this led, logically, to employing a mixed methods research design. The literature review identified no mixed methods studies that examine health and GSN app use in the LGBTQ+ community, few qualitative studies focusing on health, few studies with WSW and a dearth of research in the UK.

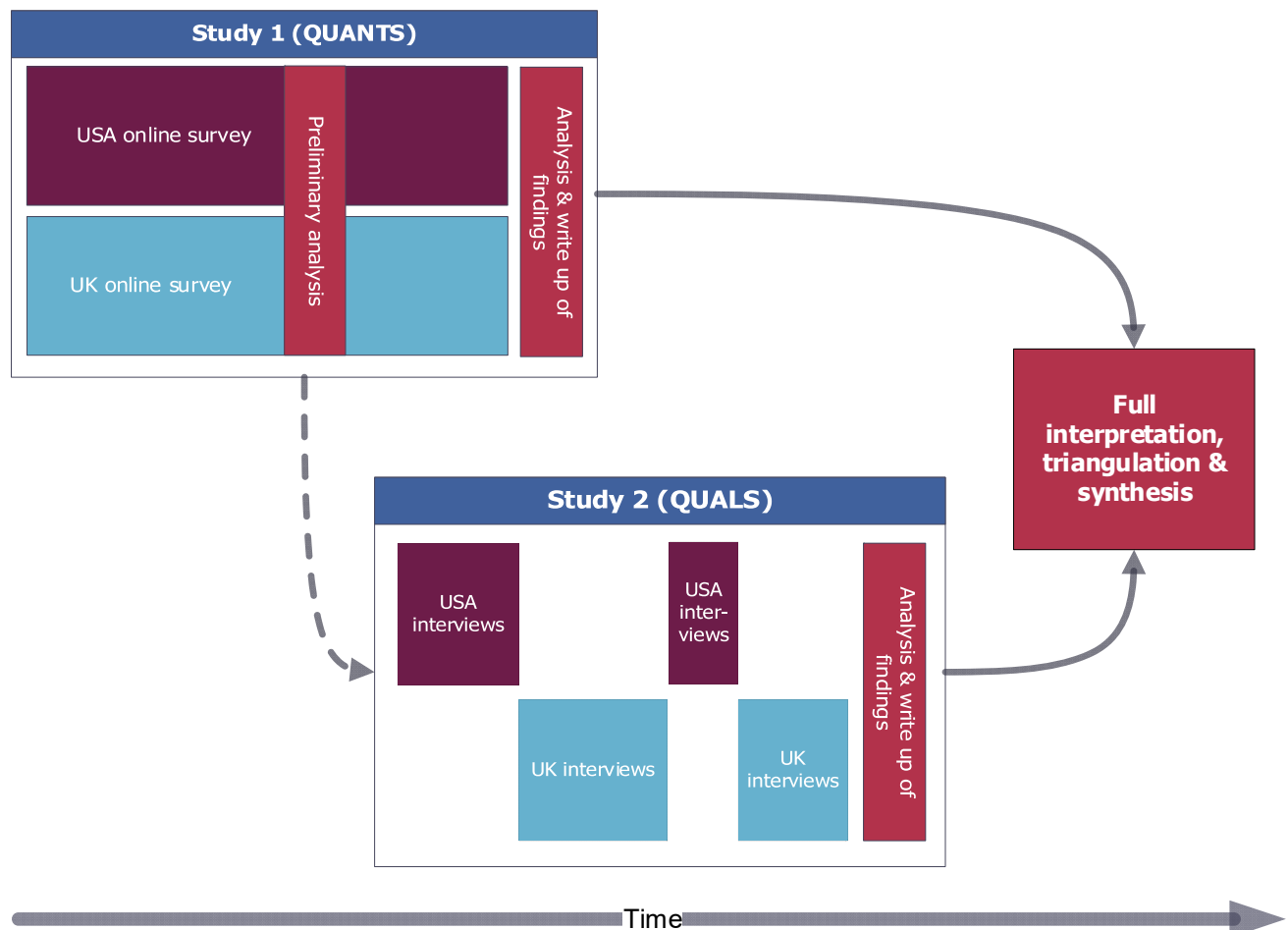
One of the central strengths of MMR is that it helps answer research questions that could not be answered by quantitative or qualitative research methods alone (Creswell and Plano Clark, 2011). Maxwell and Loomis argue that MMR researchers should preserve the fundamental differences between quantitative and qualitative approaches and try to become "bicultural"; these important differences cannot be reconciled or ignored (Maxwell and Loomis, 2002). Within MMR, drawbacks of quantitative methodology are overcome by including context, individual experience and acknowledgement of possible bias. At the same time, the disadvantages of qualitative research are addressed by not focusing solely on personal interpretations made by the researcher and using larger sample sizes which allow for more generalisability of findings (Creswell and Plano Clark, 2011). Mixed methods research is useful to explore how cultural context and social environment influence health behaviour, especially related to sexual health or HIV risk (Poundstone et al., 2004).

#### 3.2.2 Design of this mixed methods research

Creswell and Plano Clark (2011) suggest their typology-based designs will provide the researcher with a logical framework to guide implementation and ensure the MMR is persuasive, rigorous and high quality. However, reviews of published MMR shows studies are much more diverse than the strict typologies would suggest

(Maxwell and Loomis, 2002; Bryman, 2006). By their inherent nature, fixed typologies are meant to be set at the start and followed as a framework. However, MMR designs often need to change and be amended as they progress; for example if one of the elements is delayed it can impact on sequential plans (Bryman, 2007). Research is unpredictable; contexts change, availability of data varies, results from different methods can be contradictory, or time and budgets impose unexpected limits (Moffatt et al., 2006; Bazeley, 2018). Modifying methods at multiple points is far more common than a typological classification system would allow (Bazeley, 2018).

*Figure 3.1: Design of this research study*



None of the fixed typologies was appropriate to address the research objectives. Therefore, the design of this thesis is best described as a hybrid of a convergent parallel design and an explanatory sequential design (Creswell and Plano Clark, 2011). The data collection was staggered; the survey commenced first and preliminary analysis of the survey informed the qualitative data collection tools (see section 6.1). Aligning the study methodology with the rationale is more important than complying with a rigid typology (Bryman, 2006).

Therefore, in the final design of this study the quantitative and qualitative elements hold equal weight and focus on different research objectives within the overall research question. The quantitative research was conducted first and ran concurrently with the qualitative research for six months (figure 3.1). The findings of each data collection phase were analysed separately and then triangulated at the end.



### 3.2.3 Integrating two research methods

One of the most common criticisms of mixed methods research is when researchers use multiple methods to examine a research topic but then fail to link them together or effectively synthesise the findings from both methods (O'Cathain et al., 2010; Hall, 2013; Bazeley, 2018). A number of triangulation methods were reviewed before the Farmer et al. (2006) method was chosen. The narrative "weaving" method described by Fetters et al. (2013) was considered, however, this was too unstructured and the method too ambiguous. A protocol or specific set method was needed to bring together the two very different methods in a step-by-step process. Farmer et al. (2006) provide a structured framework which aims to improve the validity of research by triangulating various methods to provide a more complete, multidimensional picture of the issues.

Although the Farmer et al. (2006) protocol was initially designed to triangulate multiple qualitative data collections, it is also appropriate for mixed methods research combining quantitative and qualitative methods (O'Cathain et al., 2010). Using Farmer et al. (2006) to triangulate findings from interviews and questionnaires has previously been utilised extensively, including investigating: perceptions of STIs and experiences of GUM (Mapp et al., 2016); blood donation amongst MSM (Grenfell et al., 2011); college sexual health service improvements (Cassidy et al., 2019) and; GP antibiotic prescribing (Tonkin-Crine et al., 2016).

The Farmer et al. (2006) framework does not need methods to have the same research objectives, epistemological approaches or intended audience. Their original paper used an example of interview data and project reports on a large multi-area heart disease project. Their two methods were produced with different aims and audiences; the interviews were designed and conducted by the authors but the project reports were written by external contributors for purposes other than the research.

The process of Farmer et al. (2006) is outlined in table 3.1 below. The key findings from the survey and interviews were reviewed and overarching themes generated. These were then compared to find where there was crossover or disagreement. The convergent coding scheme was then used to examine how similar the findings were across the various methods: agreement, partial agreement, silence and dissonance. One of the key strengths of the Farmer method is that it acknowledges the importance of "silence". Silence is to be expected in this research where the quantitative and qualitative strands were aiming to address different objectives. The Farmer method also can still give prominence to key themes that are only present in one method, and allows the researcher to explain why this may be the case.

Table 3.1: Stages of triangulation protocol (adapted from Farmer et al., 2006)

Step		Activity
<b>1. Sorting</b>		Sort findings from each data source or method into similarly categorised segments that address the research question(s) of interest to determine areas of content overlap and divergence.
<b>2. Convergence coding</b>		Identify the themes from each data source. Compare the findings to determine the degree of convergence of (a) essence of the meaning and prominence of the themes presented and (b) provincial coverage and specific examples provided in relation to each theme. Characterise the degree and type of convergence using the following typifications of concurrence (or non-concurrence) within theme areas.
<b>Convergence coding scheme</b>	<b>Agreement</b>	There is full agreement between the sets of results on both elements of comparison (e.g. meaning and prominence are the same, provincial coverage and specific examples provided are the same)
	<b>Partial agreement</b>	There is agreement on one but not both components (e.g. the meaning or prominence of themes is the same, provincial coverage or specific examples provided are the same).
	<b>Silence</b>	One set of results covers the theme or example, whereas the other set of results is silent on the theme or example
	<b>Dissonance</b>	There is disagreement between the sets of results on both elements of comparison (e.g., meaning and prominence are different; provincial coverage and specific examples provided are different).
<b>3. Convergence assessment</b>		Review all compared segments to provide a global assessment of the level of convergence. Document when and where researchers have different perspectives on convergence or dissonance of findings
<b>4. Completeness assessment</b>		Compare the nature and scope of the unique topic areas for each data source or method to enhance the completeness of the united set of findings and identify key differences in scope and/or coverage.
<b>5. Researcher comparison<sup>12</sup></b>		Compare the assessments of convergence or dissonance and completeness of the united set of findings among multiple researchers to (a) clarify interpretations of the findings and (b) determine degree of agreement among researchers on triangulated findings. Plan for how disagreements will be handled and how final decisions on interpretations will be made
<b>6. Feedback<sup>13</sup></b>		Feedback of triangulated results to research team and/or stakeholders for review and clarification

### 3.3 Population of interest

#### 3.3.1 Labels and fluidity

Humans are predisposed to put people and things into categories. Social categorisation theory suggests that we view each other as both individuals and group members, and thus we are inclined to automatically perceive other people as part of social categories (Turner and Reynolds, 2010; Liberman et al., 2017). Social categories and labels can act as a heuristic that helps us interpret the world with minimal effort; enabling us to make assumptions about how others will act and feel (Liberman et al., 2017). However, such labels can also be detrimental and lead to stereotyping and negative assumptions about people, which in turn leads to prejudice and discrimination (Fiske and Neuberg, 1990; Plummer, 1998). Queer theory, a dominating theoretical approach to sociological LGBTQ+ research, is built on resistance to heterosexist norms and specifically rejects labels for sexual identity (McIntosh, 1993).

<sup>12</sup> The original protocol also aims to triangulate findings from a research team, however, due to the solo nature of the thesis the 5<sup>th</sup> stage of researcher comparison was omitted.

<sup>13</sup> The overall themes and results of the triangulation were discussed and agreed by the supervisory team

Gender and sexual orientation are becoming fluid and less rigid, especially in younger people and millennials. Although the statistics are limited, some UK research shows less than half of young people aged 18-24 identify as “exclusively heterosexual” (Dahlgreen and Shakespeare, 2015) and in the USA younger people are more likely to identify outside traditional binaries such as “man/woman” and “gay/straight” (GLAAD, 2017). New terms such as “heteroflexible”, “pansexual” and “bi-curious” appeared at the start of the 21<sup>st</sup> century as attitudes to sexual orientation changed (Carrillo and Hoffman, 2018; Greaves et al., 2019). Younger people are avoiding labels for sexual orientation and research on other identity terms shows identifying as “mostly heterosexual” (as opposed to bisexual or exclusively heterosexual) is more common in younger than older age groups (Savin-Williams and Vrangalova, 2013; Adams et al., 2014). People outside of the Male/Female binary are increasingly being recognized in legal, medical and psychological systems and diagnostic classifications (Richards et al 2016).

The number of terms used by the sexual and gender minority community has increased dramatically within the last ten years and includes a multitude of identities, all with subtly different and/or intersecting meanings. The acronym “LGBT” is rapidly extending and can now potentially include up to 12 initials (e.g. LGBTQQIP2SAA), with such long acronyms being described as “alphabet soup” (BBC News, 2018). However the increase in the number of terms has allowed more people to self-identify.

### 3.3.1 Targeting the research

Planning this research involved a decision about who was the population of interest: those who identify as lesbian, gay or bisexual (or other non-heterosexual term), or those who have sex and/or relationships with people of the same gender. These groups should not be thought of as one and the same, as sexual behaviour can often be discordant with someone’s identity labels (Pathela et al., 2006a).

This choice between an identity- or behaviour-focus would influence the research questions, inclusion criteria, recruitment materials and data collection tools for both studies. These two approaches to population groups are often used interchangeably in research and general society. The three systematic review papers looking at GSN app use are ambiguous. The Choi et al. (2017) systematic review has “focus on LGBT people” as one of the inclusion criteria; even though some of the studies appear to have included MSM participants who use apps but do not identify as gay or bisexual. Whereas, the Zou and Fan (2017) and Wang et al. (2018) systematic reviews include the general term “MSM” but do not discuss sexual orientation or any identity labels.

It is important that behavioural research includes participants who engage in same-gender sexual activity but do not identify as gay or bisexual. Heterosexually identifying MSM may engage in more HIV risk behaviours and have worse sexual health outcomes (Goldbaum et al., 1998; Pathela et al., 2006b; Siegel et al., 2008). Heterosexually-identifying MSM may be more likely to come from groups already experiencing health inequalities such as minority racial or ethnic groups, foreign-born, lower education and lower income level groups (Pathela et al., 2006b). However, men who have sex with men but identify as heterosexual are likely to be missed in HIV prevention messages (Goldbaum et al., 1998; Carrillo and Hoffman, 2016).

### 3.3.3 Identity labels and public health research

In the early days of the HIV/AIDS epidemic the characterisation of the disease as GRID (gay-related immunodeficiency disease) further marginalised gay and bisexual men and increased stigma against the LGBTQ+ community (Merson et al., 2008). The term “men who have sex with men” (MSM) started appearing in public health research, surveillance and health promotion in the 1990s (Young and Meyer, 2005). “MSM” as a label was encouraged for two main reasons. Firstly, it was an epidemiological term that described a route of disease transmission, unaffected by complex social or cultural connotations. Secondly, by describing the health behaviour (unprotected sex between men) not the identity (being gay), it sought to reduce stigma against LGBTQ+ people (Young & Meyer 2005). “MSM” became a term used worldwide, though it did overlook differences in local cultural norms, roles and sexual behaviours (Khan and Khan, 2006).

Epidemiology needs to reduce complex identities to the key issue, in this case risky sexual behaviours. Whereas queer, feminist and social constructionist academics seek to understand the complexities of sexuality not assuming an alignment of identity, behaviour and desire (Young and Meyer, 2005). The terms MSM and WSW were criticised 15 years ago for masking sexual identity and potentially impairing long-term goals of social justice and self-actualization (Khan and Khan, 2006). Young and Meyer (2005) argued that the terms undermine an individual’s self-determined sexual identity, ignore the social dimensions of sexuality critical to understanding sexual health, and give little information about specific sexual practice which is needed for public health research and interventions.

Public Health England have recently moved away from using the term MSM in their annual HIV surveillance reports. In 2016 they used the term “gay, bisexual and other men who have sex with men” (Kirwan, 2016) and in their latest HIV report (O'Halloran, 2019) have entirely dropped the term MSM and have gone back to using the term GBM (gay and bisexual men). They define GBM as “*An inclusive term for gay, bisexual and other cis or trans men who have sex with men*”(page 5; O'Halloran, 2019). This appears to be a return to the focus on identity and sexual orientation moving the focus away from the behaviour. In the USA, the CDC still use the term “male-to-male sexual contact” to refer to the route of transmission, and rarely discuss sexual orientation or identity (Centers for Disease Control and Prevention, 2020).

### Reflection box 3.2: Final decision on terms and target population

Having started my public health career in HIV epidemiology (Downing, 2007; Hargreaves, 2010; Madden et al., 2011), I am accustomed to the terms MSM and WSW. I was surprised when I saw Public Health England were returning to the term “gay and bisexual men” (O'Halloran, 2019). The HIV surveillance system records likely route of infection, I doubt this is linked to the identity box on monitoring forms the patient completed when they registered at a clinic. I had always liked that the term “MSM” would include those who may identify as heterosexual but have sex with men. I have been unable to find information about why PHE made this change, so I am unsure on their justification. I can only guess that as UK society changes, and stigma about being gay reduces, maybe more people are happy to identify as gay or bisexual.

However, browsing Grindr and my interviews revealed some men on apps do identify as straight, are married to women or are looking for “straight guys”. Mock profile 4 (Slutcumbottom) was based on a Liverpool profile that stated they were looking for “straight guys to rim and pound their ass” (see section 6.3.2 for discussion of mock profile development). If men on apps are still “straight” or “discreet” and engaging in risky sexual behaviour, is public health ready to move back to using the terms “gay & bisexual men”?

Due to my epidemiology experience using “MSM” and “WSW”, whilst designing my initial survey recruitment materials I instinctively avoided terms such as “gay”, “lesbian”, “bisexual” or “LGBT” and talked about “same-gender relationships” and “same-gender partners”. However, this makes the wording clunky, may confuse people and could potentially alienate people who were passionate about their identities. I then tried rewording using only the identity terms, but that may exclude those who identified as heterosexual but still used Grindr. I had to accept there is not a right answer and both approaches would exclude some people.

There isn't a right answer. Eventually I decided I am more interested in behaviour than identity labels, so tended to focus on “people who use apps to find same-gender partners”; my research objectives do not include the terms lesbian, gay or bisexual. However, on my recruitment materials I did try to mix it up and started with “do you use apps to find same-gender partners”, included “LGBTQ+” further down and used many rainbow colours; hopefully making the adverts more inclusive of everyone.

Throughout this thesis, I have used the terms “LGB” as well as “people seeking same-gender partners”. Although the exact definitions may be slightly different, for the sake of simplicity they can be viewed as interchangeable. The additional potential problem of the term “same-gender partner” potentially reinforcing gender binaries is discussed in reflection box 4.1. The term LGBTQ+ is used as an umbrella term when referring to the wider community or generally to sexual and gender minority people.

In the analysis of the survey, binary identity labels are used (gay/lesbian/homosexual and bisexual/other/no term) as identity was found to be generally consistent with sexual behaviour and attraction (section 5.2).

### 3.4 Ethical considerations

Both studies explored the personal lives, sexual experiences and health of participants, therefore, full ethical review was needed from the LJMU Research Ethics Committee (LJMU REC).

#### 3.4.1 Study one (online survey)

An initial ethics application was submitted in October 2017 and approved in November 2017 (ref: 14PHI001). Most ethical considerations for the study were standard to any survey research focused on personal issues. These included ensuring confidentiality, informed consent, data protection, possibility of withdrawing and minimising distress or risks to the participants (Olsen, 2012).

The first unique ethical issue that needed careful consideration related to the method of recruitment – commercial Facebook advertising. This was the first research study to go through LJMU REC that used commercial Facebook advertising so the application was accompanied by a comprehensive document explaining Facebook advertising and how anonymity and confidentiality would not be compromised (see appendix B). The other issue that needed careful attention was how to collect contact details for participants who wanted information about the second study, in a way that did not link to their survey responses. Participants followed a link to another, separate Bristol Online Survey if they wanted to be contacted about the second study – this way their personal details were in no way linked to any responses.

#### 3.4.2 Study two (interviews)

A LJMU REC application was submitted and approved July 2018 (ref18/PHI/030). There were a number of ethical issues that required special consideration in this study, on top of the standard issues that would relate to all qualitative research such as informed consent, data protection and robust research design (Bowling, 2014). The first related to the potential identification of participants. A qualitative study such as this provides rich descriptions of participants and their behaviour so deductive disclosure could lead to confidentially breaches (Kaiser, 2012). The final presentation of data must ensure individual participants should be able to recognize themselves, but a reader should not be able to recognize them (Given, 2008). This is particularly important given the geographical confines of the research. All place names, jobs, organisations, and education establishments were anonymised. Due to the frequency of mentions and size of the cities, references to Liverpool and New Haven were not removed. Participants were asked to choose a pseudonym for writing up the interviews and for labelling any quotes. Pseudonyms are particularly useful for research on sensitive topics (Given, 2008), such as the discussion of sexual health, HIV risk and drug use covered by some participants.

Secondly, venues for interviews offered a challenge both in term of practicality and ethics. Participants were offered an interview in a café or the meeting rooms in the researcher's office or on SCSU campus. Interviews with staff and students at LJMU and SCSU were the easiest to organise and were offered in university classrooms, meeting rooms or private library rooms as well as cafés. After the application was submitted the REC raised some issues with the place of the interview, as they were concerned how confidentiality would be maintained in a public venue such as a café. Relatively little focus is given to interview venue in the literature. Herzog (2012) argues that the interview location plays a role in constructing reality and the choice of interview

location (who chooses and what place is chosen) is more than just about convenience and comfort. Offering the option of public café or a university premises was also the approach taken in a study that interviewed Grindr users in Newcastle-upon-Tyne (UK; Bonner-Thompson, 2017).

The amended ethics application outlined how participants would be offered a café as one option of where to meet, the participants would be made aware they could be overheard, the researcher would regularly check the participant was comfortable with the people around and if other members of the public sat too close, the researcher would suggest moving tables.

### **Reflection box 3.3: Ethics - are LGBTQ+ people “vulnerable”?**

The LJMU ethics forms asks if participants will come from any vulnerable groups (e.g. children under 16, those with learning disabilities or mental illness, drug/substance users, etc.) and the applicant must justify their inclusion. The feedback on my application included a REC comment *“Could the participants be considered vulnerable? Because the study focuses on their sexuality and related privacy issues?”*

I often encounter this assumption that gender and sexual minorities are all vulnerable and in need of help or protection, indeed Tolley et al. (2016) include LGBTQ+ and intersex persons in their relatively short list of vulnerable people in their textbook on qualitative methods in applied public health research. Levine et al. (2004) argue that so many categories of people are now considered “vulnerable”, that virtually all potential human subjects could be included on such a list.

However, there is a difference between those who are personally vulnerable (those whose cognitive limitations or age mean they are incapable of judging the consequences of taking part in research) and those who are politically vulnerable (those competent to give consent but whose political, social, or economic circumstances make them open to coercion or deceit; Silvers, 2004). LGBTQ+ people could be seen as politically vulnerable but Silver argues that making decisions about consent for politically vulnerable groups would be “regrettably paternalistic and could thereby exacerbate their being treated with disrespect” (Silvers, 2004, p.56). The experiences and vulnerability of LGBTQ+ communities varies by country, and it is beyond question that LGBTQ+ people in many countries are extremely vulnerable to exploitation (Ekmekci, 2017). However, I do not believe this is so much of a worry in the two study sites as to class all participants in this study as “vulnerable”.

Whilst I acknowledge that many LGBTQ+ people face difficult circumstances and ill-health, this is often due to the way they are treated in the world; happening to be lesbian, gay, bisexual or trans does not make one innately vulnerable. The most confident, strong, healthy and empowered people I know happen to be LGBTQ! I responded to this comment on the ethics form with the statement below and it received REC approval:

*‘I do not consider LGBTQ+ people, or people of any sexuality using GSN apps, to be vulnerable. GSN app use is extremely commonplace, particularly amongst men who have sex with men (estimated 700,000 Grindr users in London alone; Grindr, 2015) so this is not a niche group. Equally, discussing sexuality in a confidential interview does not make someone vulnerable - discussing dating life with gay people should be approached with the same ethical considerations as we would when we talk to heterosexual people.’*



A third important ethical consideration was that, given the topic of conversation, there was scope for the participants to become distressed or uncomfortable during the interviews (Tolley et al., 2016). Some participants did discuss distressing topics such as sexual assault, coercion, drugs and alcohol, mental health, self-esteem, body image, loneliness, STI diagnosis and HIV exposure. The participants were informed at the start of the interview they were free to say “skip” to any questions they felt were too personal or that they did not want to discuss; this was done by a few participants, one example being when the participant talked about being sexually assaulted by someone they met on a GSN app. The information sheet included contact details of UK or US organisations that support LGBTQ+ individuals. During the interview, some participants showed signs of misunderstanding some sexual health issues or asked the interviewer for information, indeed Tolley (2016) recommends researching appropriate referral services prior to beginning data collection. For example during one UK interview the male participant was extremely nervous about accessing sexual health screening for the first time so was signposted to the local GUM, the researcher reassuring him about the friendly and non-judgemental staff. In another UK interview, the participant misunderstood the purpose of PrEP and when the researcher had explained the drug and how to access it, the participant asked for the details of the national PrEP Impact Trial.

Interview participants were given a £10 or \$12 Amazon voucher to reimburse them for any travel expenses and compensation for their time. Reimbursing each participant in cash for travel is very challenging and generic vouchers are convenient and fair for all. A small reimbursement for time and any travel expenses is considered fair and ethical (Cook, 2012), especially as this population group are not considered impoverished and are unlikely to be coerced into an interview for a relatively small amount of money. The participant information sheet and consent form can be found in appendices F and G)

### **Reflection box 3.4: Ethics – GDPR**

This second study came after the introduction of the European Union’s General Data Protection Regulation (GDPR). The main impact on this research related to the participant information sheet (PIS). Whereas the PIS for the online survey (study 1) was two sides of A4, the PIS for the interviews was double the length at four sides. Most of this increase was due to standardised GDPR text that REC required. Thankfully, those who read the long interview PIS had already had contact with the researcher and were most likely already quite motivated to take part and commit the time to an interview.

I believe one of the main things that put people off completing the online survey was the long PIS on the first page that managed to be both scary and dull. The way I conducted the research, maintained confidentiality and data protection did not change between study one and two. However, if the GDPR had been enacted and had my online survey needed the longer GDPR-compliant PIS, I suspect my response rate would be been even lower (the landing page of the survey was accessed over 1700 times but only 294 people started the survey).

There had been much debate in the literature about the usefulness and limitations of the GDPR with some being concerned it would impose strict rules that limit the use of health data and negatively affect research (Casali, 2014). However, more recent publications argue it provides additional protections and balances the rights of patients with the needs of science (Chassang, 2017; Rumbold and Pierscionek, 2017).

### 3.4.3 Southern Connecticut State University ethics procedure

To increase recruitment and distribute recruitment materials through the LGBTQ+ student organisation at SCSU an application was made to the SCSU Internal Review Board (IRB) in October 2018. This combined application covered study one (survey) and study two (interviews). The IRB process was similar to LJMU REC, but with less focus on data protection, as GDPR legislation only covers EU countries. Applying to more than one IRB or REC can cause problems if the response or comments from the two committees contradict each other (Wolf et al., 2002). However, the SCSU IRB approved the application without any issues (see reflection box 3.5). SCSU ethical approval was granted on 10/26/19 (ref 18-146).

#### Reflection box 3.5: Two ethics committees

Applying to two separate ethics committees was challenging, and time-consuming. I had originally hoped to avoid this, as I did not intend to target recruitment at SCSU students or staff. However, as my 10 weeks in CT went on I had to use every avenue possible to recruit to the interviews. In retrospect, I should have applied for SCSU IRB approval from the UK before travelling to CT, but I was naive and had not expected recruitment to be quite so challenging. Having the SCSU name on my recruitment materials from the start may have helped with recruitment.

The SCSU IRB procedure was very similar to LJMU REC in many ways. The chair of the SCSU IRB was friendly and helped explain some things. One of his main concerns was whether I would have Mandated Reporter responsibilities like the staff at SCSU. The mandated reporting law states that if students disclose sexual misconduct, intimate partner violence or stalking the university employee must formally report it to the university (Southern Connecticut State University, 2019). This effectively means any staff doing research with students cannot guarantee confidentiality if participants disclose experience of sexual assault etc. Speaking to other researchers at SCSU this seemed to limit the topics they could research. This differs from the LJMU REC policy where we only break confidentiality if participants disclose abuse of children or vulnerable adults, money laundering or acts of terrorism. The IRB chair concluded as a visiting academic without an SCSU employment contract this would not apply.

Another concern was the problems I would face if the IRB requested any changes to the methodology or documentation. I was honest with the IRB chair and explained that even if they asked me to change something I would not be able; the study had been approved by LJMU REC, had already started and LJMU would not allow me to change anything without their approval. I had a vision of being stuck in an endless ethics loop. Thankfully, SCSU IRB approved the study with no changes.

The final challenge of the SCSU IRB was they differentiated between anonymity, privacy and confidentiality and asked me to explain how I would maintain each. For the IRB privacy related to participants "*having control over the extent, timing, and circumstances of sharing themselves (physically, behaviorally, or intellectually) with others*". Privacy was a new concept to me and previously I had assumed this was covered by ensuring confidentiality and anonymity. The SCSU IRB was less detailed and considerably shorter than the LJMU REC application form. A colleague in the Department of Public Health at SCSU read my application and was surprised by how much detail I included on my application form. I also attached both LJMU ethics applications - I suspect I bamboozled them with detail!

## Chapter Four | Online Survey Methodology (Study 1)

The main objective of this explorative and descriptive, cross-sectional survey was to understand patterns of GSN app use; how and why people in the UK and USA use GSN apps to find same-gender partners and if there are any differences in use and intentions between the research sites or gender groups. This chapter presents the methodology of this study.

### 4.1 Survey research

A survey was chosen as this is a way of providing information on the attitudes, experience or behaviour of a large number of people that can be generalised to a broader population (Robson, 2002). Self-administered and online surveys are an efficient way of gathering anonymous data; which is beneficial for sensitive topics such as sexual behaviour (Robson, 2002; Lewis-Beck, 2004; Creswell and Plano Clark, 2011). Surveys are particularly good for descriptive research, providing a range of information about the participants and the relationships between these characteristics (Robson, 2002).

An online survey was chosen to allow data collection in the UK and USA at the same time. Online tools are a cheap way to administer a questionnaire, and allow for complex routing, data validation and remove the need for manual data entry (Lewis-Beck, 2004; Jacobsen, 2016; Mclean et al., 2020). The main criticism of online surveys is that they are not representative of the general population as there are likely to be differences between web users and non-users (Lewis-Beck, 2004; Vehovar, 2016). However, this is not a major concern in this study as the population of interest are all, by fact of using GSN apps, users of the internet-enabled smartphones.

Online surveys typically have a low response rate (Lewis-Beck, 2004; Fielding, 2017), it is usually impossible to ascertain the response rate or characteristics of the non-responders; therefore we cannot be confident the sample is representative (Robson, 2002; Mclean et al., 2020). One way to understand representativeness is to compare participant demographics against the demographics of the wider population (Mclean et al., 2020). However, understanding the demographics of the general LGBTQ+ population is very challenging.

Research with MSM in the UK has compared participants recruited through non-probability surveys, including internet surveys, against those in the nationally representative probability sampled NATSAL-3 (Prah et al., 2016). Participants recruited through non-probability surveys (for example the European Men's Internet survey; Weatherburn et al., 2013) tend to be younger, better educated, more likely to report "gay" identity and report higher numbers of sexual partners and more unprotected anal intercourse, than those in the nationally representative NATSAL-3 (Prah et al., 2016). Although probability-based sampling may have many advantages it can be difficult and costly to implement and can grossly under-represent minority groups – for example ethnic minority MSM (Stueve et al., 2001). There is no fully effective sampling frame for sexual minorities and the small number of sexual minorities tend to get lost in large representative general population surveys (Hickson et al., 2017a). The majority of population health research with sexual minorities, therefore, has to use convenience or purposive samples. The initial recruitment method of stratified sampling through Facebook adverts was an attempt to produce a non-probability sample. However, as this had to be changed to purposive sampling it is likely the bias remains (section 4.3 for detailed discussion of sampling).

As with all survey methods there is potential for participants to answer dishonestly; even in anonymous surveys there can be a social desirability response bias (Robson, 2002). Questions must be written to reduce ambiguity (Robson, 2002), this is particularly important in cross-cultural research (Cieciuch, 2016; see section 4.2.2.3). Online surveys, and particularly web panels, are not appropriate if the research aims to establish accurate prevalence estimates or epidemiological data (Erens et al., 2014a). However, this is a descriptive and exploratory study aiming to explore relationships between factors, so this is not as big a concern. The advantages of an online survey far outweigh the potential disadvantages, especially as all the target population are users of the internet and social media.

## 4.2 Survey tool

### 4.2.1 Questionnaire development

The questionnaire explored which GSN apps people used; any perceived differences between the apps; how often they used them; and what kind of experiences and partners they were seeking. Where possible, validated questions were used to save time and allow comparison with previous research (Boynton and Greenhalgh, 2004). Questions had to be based on research with MSM as there was no quantitative research published on app-use by WSW (Choi et al., 2017).

Most of the general demographic and behavioural questions came from large national and international MSM health surveys conducted by charities or governmental organisations. These included Sigma's *Gay Men's Sex Survey* in the UK (SIGMA Research, 2014; Hickson et al., 2016), *The European MSM Internet Survey* (Weatherburn et al., 2013; ESTICOM, 2017), and PHE's *Positive Voices: the National Survey of People Living with HIV* (Public Health England, 2017). Some questions were also adapted from the UK's large nationally representative sexual attitudes and lifestyle survey *NATSAL-3* (NATSAL, 2010; Erens et al., 2014b).

Eleven questions relating to motivations for using GSN apps, frequency of app use and types of partners met on apps were adapted from peer-reviewed research in the USA. Although original surveys were unavailable, the methodology or results sections provided enough information to deduce question wording. The research from which app use questions were taken included:

- one study of MSM attending an LGBTQ+ health venue in Los Angeles for STI screening (Beymer et al., 2014)
- two studies recruiting MSM through Grindr; one in Los Angeles (Landovitz et al., 2013) and one in Atlanta (Goedel and Duncan, 2015),
- and one study of men using dating websites in the USA (Rosenberger et al., 2014).

Demographic information was collected to allow comparison between groups. The "Outness Inventory" (OI), a validated measure of openness about their sexual orientation (Mohr and Fassinger, 2000) was also included to investigate relationships between "outness" and risk-taking behaviour, app use or sexual health outcomes. The OI's 1-7 Likert scale measures how open participants are about their sexual orientation with a list of 11 groups of people, with the additional option of N/A (see appendix J). The researcher generates mean scores from the 11 groups of people to create four scores:

- Out to Family = average score of *mother, father, siblings* and *extended family/relatives*
- Out to World = average score of *my new straight friends, my work peers, my work supervisor(s)* and *strangers/new acquaintances*
- Out to Religion = average score of *members of my religious community (e.g., church, temple)* and *leaders of my religious community (e.g., church, temple)*
- *Overall Outness* = mean of the above three subscales

Although originally published nearly 20 years ago, this tool has been recently used in research on associations between outness and mental health (Feldman and Wright, 2013; Riggle et al., 2017) and experiences of stigma by LGB people of colour (Feldman and Wright, 2013). Only the first two measures were used in final analysis. Very few participants completed the Out to Religion Measure and, as a composite measure, the Overall Outness could not be included in any logistic regression analysis.

Finally, four researcher-developed open-ended questions were included to provide some brief information about how people perceive the risk and benefits of app use. The findings from these questions informed the content of the mock profiles for the second study (see section 6.3.2).

- *What do you think are the benefits of using and meeting people through these apps?*
- *Is there anything you worry about when using and meeting people through these apps?*
- *Have you had any negative experience of using these apps that you would like to tell us about?*
- *Is there anything else you want to tell us about how or why you use these apps?*

The final version of the questionnaire (including PIS and consent information) is included in appendix M.

## 4.2.2 Challenges with the questionnaire

### 4.2.2.1 Using questions valid for all genders

One of the biggest challenges was identifying survey tools for WSW about sexual health and especially app-use. WSW have long been overlooked in LGBTQ+ sexual health research (Rosser, 1993; Ellis, 2015) and validated questions aimed at WSW or non-binary individuals are rare. To keep the routing simple the same behavioural questions were asked of people of all genders so questions were chosen that could apply to everyone. Some general questions were taken from the NATSAL-3 study (Erens et al., 2014b), though this sample is not specifically LGBTQ+ so most questions about sexual behaviour and identity are general and gender neutral. However, the NATSAL-3 questions use very gender binary terms and only asked about sex with men and women.

### 4.2.2.2 Measuring the act of sex

Different risk is associated with different sexual practices; to get accurate survey data it is important to specify exact sexual acts and partners (Scott-Sheldon et al., 2010). However, this causes challenges when surveying the LGBTQ+ community because there are potentially endless pairings of gender identities, genitals and sexual acts. For example, asking about condom use in vaginal sex with a trans couple might not be appropriate as neither of the couple may have a penis; assuming lesbians do not need birth control may be false if one of the couple is a non-binary and has a penis. These questions may lead to unreliable data as the researcher may presume “risky” or “safe” behaviour when it is the opposite. The numerous possible combinations can rarely be included on surveys, due to space and the ethics of asking such intrusive questions.

However, guidance on how to design inclusive questionnaires is scarce and sex research guidance is often heteronormative and does not explicitly include non-heterosexual couples or focuses on pregnancy and fertility. For example, The Handbook of Behavioural Medicine's chapter on assessment of sexual behaviour does not even acknowledge measuring/defining sexual acts between same gender or gender diverse partners (Scott-Sheldon et al., 2010)

As an exploratory study potentially involving all possible combinations of various gender couplings, the questionnaire could only include some very general questions about sexual activity. Two main measures of sexual behaviour were chosen "number of sexual partners in previous 12 months" and "number of sexual partners met on apps in previous 12 months. From these a third variable was calculated: percent of sexual partners met on apps.

For sex involving two cisgender men, the definition of "sex" is clearer and easier to define than sex between women. In a US study with LGB men and women the "gold standard" definition of sex between men was anal-penile intercourse (91% of men agreeing this is "having sex"). However there was no mutually clear standard for women (Sewell et al., 2017). Lesbian and bisexual women, both cis and trans, have particular difficulty completing sexual health surveys as questions can invalidate experience and lead to inaccurate data when no penis is involved (Carrotte et al., 2016). WSW often have difficulty defining "what counts as sex" and queer women's media amusingly portrays this confusion (see appendix C; Autostraddle, 2010). The NATSAL-3 defined sexual intercourse or "having sex" as including "*vaginal, oral and anal intercourse*" and separates this from other "*forms of contact with the genital area NOT leading to intercourse (vaginal, oral, or anal), but intended to achieve orgasm, for example, stimulating by hand (mutual masturbation)*" (NATSAL, 2010, p.37). However, this would exclude some of the most common sexual practices reported by WSW such as vaginal penetration with fingers and mutual masturbation (Bailey et al., 2003).

To ensure the questionnaire was not heteronormative but as inclusive as possible, a definition of sex was given next to relevant questions. Although the phrase used came from the Gay Men's Sex Survey (SIGMA Research, 2014), it is broad and relevant to include all sexual acts and gender pairings and not just penetration or penises. This broad definition allowed participants more freedom to define sex themselves.

*"In this survey, we use "sex" to mean physical contact to orgasm (or close to orgasm) for one or both partners."*

### Reflection box 4.1: Putting people in boxes

Full disclosure: I like my labels. I am proud of the labels I use for myself ("lesbian", "feminist", "foodie", "cat person") and I feel these labels are an important part of my identity. I am also lazy; I want things in neat categories and boxes. It makes my life easier and ordered when I use shortcuts to understand the world.

However, significant numbers of the LGBTQ+ community avoid labelling themselves and using a term to define their sexuality or gender (Adams et al., 2014). Some people feel that both gender and sexuality are fluid and can vary over time. People want the freedom to change their behaviour and identity and do not want to be restrained by one label or category. People outside the Male/Female binary are increasingly being recognized in legal, medical and psychological systems and diagnostic classifications (Richards et al., 2016). I appreciate avoiding labels is important to some people, and in my real life I fully respect this and would never impose a label or force people to choose a category.

However, when it comes to quantitative research, I must do this. The essence of this thesis is investigating how people use apps to find same-gender partners. Therefore, this fundamentally assumes there are a small and finite number of genders; maybe only two. For those who fall outside of this and define as "genderqueer", "gender fluid", "non-binary" or as having no gender, where do they fit in my research? I am effectively forcing people to pick a gender: "man", "woman" or "other". So three genders? What if someone who defines as "other" is dating a man – does this mean they are not in a "same-gender relationship"? Are they only in a "same-gender relationship" if they date someone who also defines as something other than a man or woman?

Historically we have used the term MSM to refer to men who engage in sexual activity with men because many will still identify as heterosexual. HIV research has avoided talking about "gay men" or "homosexuals" so as not to exclude those who think of themselves as heterosexual but engage in sex with men (Young and Meyer, 2005). Due to my history as a public health epidemiologist, whilst designing my recruitment materials I intentionally avoided terms such as "gay", "lesbian", "bisexual" or "LGBT" and talked about "same-gender relationships" and "same-gender partners". I avoided labels and terms for sexual orientation, but in doing so I reinforced labels for gender.

I had some feedback from an intersex non-binary participant in Connecticut who had tried to complete the survey and struggled to answer some of the questions that related to gender. They commented on the Facebook advert and I had an interesting and friendly email conversation with them about the wording of some questions. They also did not like the use of the term "opposite sex", which implies that gender is binary. I tried rewording this question many times but it just was not possible.

If I am honest, I was disappointed that 10 Connecticut respondents chose "other" as their gender. I also know this is ridiculous, unfair and possibly discriminatory, but I wanted to be able to break down analysis by men and women. Having such a large proportion of CT respondents identify as neither man nor woman means these cells now include smaller numbers. Again, this is possibly me putting my laziness (and possible bias) onto the research and wanting nice easy categories to analyse. In the end I had to exclude the Other category from most of the analyses by gender, which made the sample smaller and weakened my associations/analysis.

I have been concerned it was not a trans-inclusive piece of research, but I did my best to look at relationships and sexual orientation and I was not focusing on gender identity. Therefore, unfortunately, some people's individual experiences will never be captured in the form of a survey. The mixed method design should help overcome this. I am also aware trans and non-binary people experience a whole host of other challenges in dating/using apps and this could be a PhD thesis on its own. Further research is needed with this group.



#### 4.2.2.3 Harmonising cross-cultural surveys

In cross-cultural research, it is important to harmonise surveys across countries. We should not just focus on validity and reliability (see section 4.2.4) but also check measures are comparable. Harmonization is the efforts to standardise inputs and outputs in multinational, multicultural or multiregional surveys. The overall aim is to achieve or improve comparability of different survey measures. It is especially important in cross-cultural surveys when aiming to combine data into a single integrated dataset (Survey Research Center, 2016).

Although English is the dominant language in both UK and USA, there are systematic differences in vocabulary and syntax (Harkness et al., 2016). There was a danger, as a UK-based researcher, of accidentally producing a UK-centred questionnaire or using UK-specific terms or language. The validity of the app-use questions was improved by adapting or taking questions verbatim from American research studies. Many of the questions about identity and general dating behaviour came from the European MSM Internet Survey (ESTICOM, 2017) which is a large cross-cultural survey specifically designed to be valid in a variety of European counties, though, admittedly not the USA.

For the majority of the questionnaire ex-ante input harmonisation was used. In ex-ante input harmonisation the same question is used in all contexts, with questions designed to be applicable and relevant in both countries (Wolf et al., 2016). The surveys were piloted in the UK and USA and language checked to ensure it was understood and used in similar ways in both countries (see section 4.2.3 for piloting).

For ethnicity and education measures ex-ante output harmonisation was used and participants directed to separate questionnaire sections dependent on where they lived. Ex-ante output harmonisation uses questions that refer to the same concept and indicator, but response categories vary by country. These questions are designed to be recoded into a third variable that is comparable across both countries (Wolf et al., 2016). Any measurement of ethnicity, race or ethnic origin is extremely complex. There is not even consensus on which word ("ethnicity" or "race") best describes of a person's physical, culture, language, colour and religion (Ford and Kelly, 2005). The UK census asks about ethnic group and the US asks for race – both with different response categories. The final survey included the UK census question and for the US participants the question was based on Beymer et al. (2014). The ex-ante output harmonisation recoded both ethnicity/race questions into a binary variable of *white vs person of colour* (table 4.1).

For most cross-national surveys educational attainment can only be measured using country-specific response categories (Schneider and Ortmanns, 2015). As well as qualifications being different, people in the US and the UK take exams and move between schools at different ages. Therefore, an ex-ante output harmonisation used a separate set of questions in each area and these were recoded into four comparable variables in the data cleaning process.

*Table 4.1: Measures on the questionnaire with ex-ante output harmonisation*

	<b>US Question</b>	<b>UK Question</b>	<b>Output variable</b>
<b>Education</b>	<p>What is the highest level of education you completed?</p> <ul style="list-style-type: none"> <li>• Never attended school</li> <li>• Grades 1 through 8</li> <li>• Grades 9 through 11</li> <li>• Grade 12 or GED</li> <li>• Some college, Associate's Degree, or Technical Degree</li> <li>• Bachelor's Degree</li> <li>• Any post graduate studies</li> <li>• Prefer not to say</li> </ul> <p>(Beymer et al., 2014)</p>	<p>What is the highest level of education you have completed?</p> <ul style="list-style-type: none"> <li>• None</li> <li>• Qualifications at 16 (GCSE, NVQ, O-Levels)</li> <li>• Qualifications at 18 (A levels, AS Levels, high school diploma, BTEC Level 3)</li> <li>• Further education college/HND/HNC/City &amp; Guilds or equivalent</li> <li>• Undergraduate degree</li> <li>• Postgraduate degree or higher</li> <li>• Prefer not to say</li> </ul> <p>(Public Health England, 2017)</p>	<p>Level of education:</p> <ul style="list-style-type: none"> <li>• A levels/GED or lower</li> <li>• Further education/some college</li> <li>• Undergrad/bachelors</li> <li>• Post grad</li> <li>• Missing</li> </ul>
<b>Ethnicity/race</b>	<p>Which of the following best describes your race?</p> <ul style="list-style-type: none"> <li>• White</li> <li>• Black or African American</li> <li>• Hispanic or Latino</li> <li>• Asian/Pacific Islander</li> <li>• Multiracial</li> <li>• Other</li> <li>• Prefer not to say</li> </ul> <p>Adapted from Beymer et al. (2014)</p>	<p>Which of these best describes your ethnicity?</p> <ul style="list-style-type: none"> <li>• White or white British</li> <li>• Mixed</li> <li>• Asian or Asian British</li> <li>• Black or black British</li> <li>• Other</li> <li>• Prefer not to say</li> </ul> <p>UK 2010 Census question – categories aggregated</p>	<p>Ethnicity:</p> <ul style="list-style-type: none"> <li>• White</li> <li>• Person of colour</li> <li>• Missing</li> </ul>

### 4.2.3 Piloting and pre-testing

Pre-testing aims to detect and rectify problems before the standardised procedure is finalised (Willis, 2016). In this study the pre-testing focused on the questionnaire instrument to check it was understandable and unambiguous (Robson, 2002). The pilot survey was distributed to colleagues, contacts and networks already known to the researcher (including public health, science and sociology researchers and LGBTQ+ community members). People were asked to respond to the survey as if they were someone using the apps to seek same gender partners. The pilot results included 25 responses and written feedback was also received from 10 people. The feedback related to:

- spelling mistakes and complicated phrasing in the PIS
- querying which questions should be “tick all” or “tick one”
- putting validation on some of the open text field that ask for numbers (e.g. age)
- routing issues
- suggestions of other app brands to add to the list
- layout of questions, tables and definitions

Some of the commenters felt the Outness Inventory (Mohr and Fassinger, 2000) needed rewording. However, this was not possible due to it being a validated tool.

#### 4.2.4 Ensuring validity and reliability

In all designs it is important to have confidence in our results and methodology; concepts referred to as *validity* and *reliability*. Validity relates to the notion that we are assessing what we intend to assess. Validity can be increased by external review of the study design, by a diverse audience, and pre-testing the instruments in the target population (Reynolds and Guest, 2015). Both of these were done in the pre-testing/piloting phase.

External validity refers to the extent to which findings are based on a sample that can be generalised to similar populations in terms of contexts, individuals, times, and settings (Lavrakas, 2008). The use of an online survey and recruitment through Facebook and other online communities could limit the generalisability of this research. This is not too concerning as there is likely to be a large crossover, with most people who use GSN apps using other social media platforms. However, we must acknowledge that there will be some GSN app users who do not use Facebook and this is a limitation of the study, even though in an exploratory study such as this we are not aiming for the findings to be fully generalisable (Jupp, 2006).

#### Reflection box 4.2: Lost participants

Bristol Online Surveys only saves data from participants who complete the full questionnaire and press "Finish" on the final page. I had not appreciated this before the survey was launched and, with hindsight, I may have chosen a different survey tool. Qualtrics appears to save all responses, however I was unaware of this software when I started designing the study. BoS was the main tool other PhD students and colleagues in my department had used and provided all the functions I needed.

The survey was not completed by 30% (n=87) of those who started it, which is disappointing and frustrating when I struggled so much with recruitment. BoS allows you to see how many people left the survey on each page. Two pages had particularly high dropout:

- Page 2, the first page of questions asked if they had used a GSN app in the last 12 months; 16 individuals left the survey on at this point (5% of all those who started the survey). I assume some of these people were not eligible so closed the window and some people clicked this far to have a look at the questions and decided they did not want to take part.
- Page 10, the Outness inventory (MOHR) question – 15 participants dropped out of the survey on this page. This question was a large and unwieldy table, especially on a mobile phone screen. As a validated tool there is very little scope to change the layout, but I did attempt to make it more user friendly by splitting it into two questions.

We can assume the 25 people (9%) who dropped out before the screening page (page 4) were most likely not eligible to take part in the research. However, those who dropped out after this (n=62, 21%) were eligible for inclusion but decided not to finish the survey.

All questions were mandatory, though all had a prefer not to say option. Any prefer not to say answers were recoded as system missing – although the proportion of participants choosing not to answer questions was very small. Forcing participants to answer each question, even with a prefer not to say option, may have put some people off and pushed them to shut the survey. However, I feel the prefer not to say option was important as without it participants may have just clicked "next" and not completed questions.

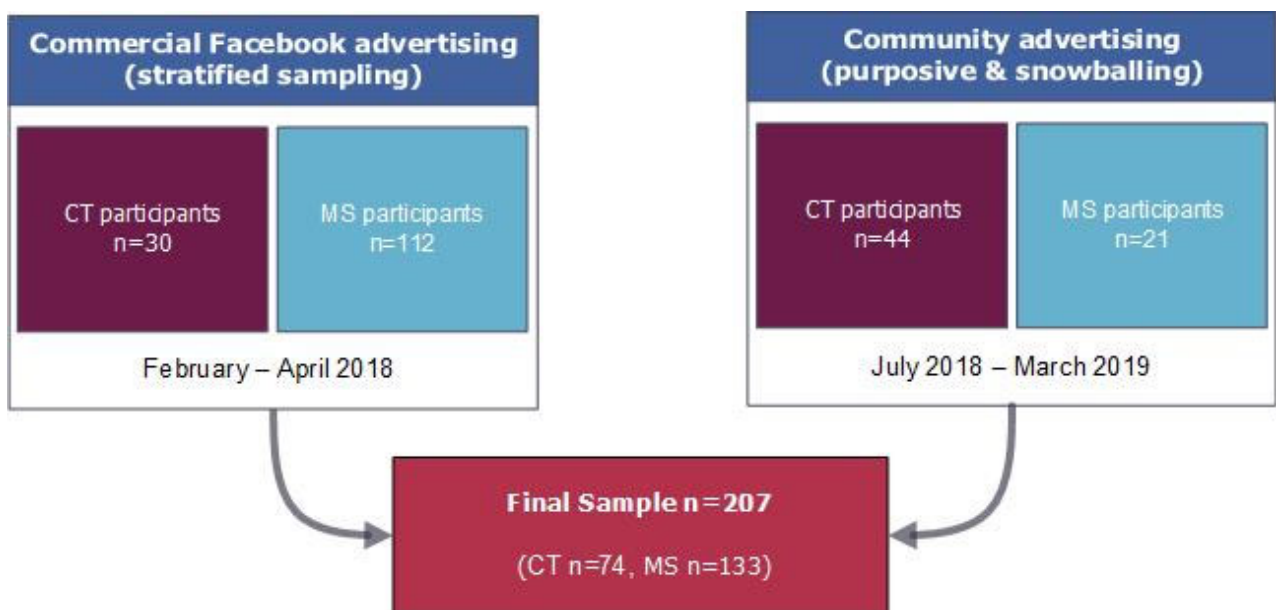
Attrition rates are a possible threat to validity of this survey research. Bristol Online Surveys shows the number of participants who drop out at each question and do not complete the survey. Eight two participants left the survey before completion; this is 29% of those who started the survey (see reflection box 4.2). Unfortunately, BOS does not save any details about these participants so we cannot know if this attrition will introduce bias.

Detailed measurements of reliability and construct validity were not needed in this survey as the questions related to recent behaviour or demographics. Very few questions measure concepts or psychological measures, therefore measurement of internal consistency (such as Cronbach's alpha) is not needed (Tavakol and Dennick, 2011). The main measure addressing a concept is the idea of "outness" and uses the validated Outness Inventory (Mohr and Fassinger, 2000). This has already been tested in various populations and is shown to be reliable and valid. Sexual orientation is also notoriously difficult to measure or define (Wolff et al., 2017) so a three-part measure was used: sexual identity, sexual behaviour and sexual attraction (Geary et al., 2018; see section 2.2.2 for full discussion of three dimensions of sexuality). To ensure validity of the different recruitment methods, participant demographics were examined for those who completed the questionnaire prior to 30<sup>th</sup> April 2018 and after (date the commercial Facebook advertising ceased; see table 4.3, section 4.3.3.3).

### 4.3 Sampling and recruitment

Participants were residents in Connecticut and Merseyside, aged 18 and over, who had used any GSN apps in the last 12 months to find same-gender partners for sex, relationships or friendships. Respondents could identify as any sexual orientation or gender identity as long as they were seeking partners of the same gender. Two approaches to sampling and recruitment were used (see figure 4.1 for an overview and table 4.2 for a detailed breakdown of participant demographics)

Figure 4.1: Overview of sampling and recruitment methods for survey (inc. final no. of eligible surveys)



### 4.3.1 Initial sampling method – stratified sampling

The initial strategy used stratified sampling to recruit participants using commercial Facebook advertising. The four strata were based on gender and area of residence (men in CT, women in CT, men in MS and women in MS<sup>14</sup>). Stratified sampling allows us to make within-stratum inferences and comparisons across strata (Daniel, 2012). Using commercial Facebook sampling could be viewed as probability sampling as all Facebook users who fulfil the criteria have an equal chance of seeing the recruitment adverts when they log onto Facebook. Probability sampling employs a form of random selection and gives every individual in the target population a similar chance of being selected (Daniel, 2015). However, the control of the random selection was handed to Facebook algorithms. Probability sampling is appropriate for quantitative research as it should produce a heterogeneous sample, allows us to make important statistical generalisations and should reduce selection bias (Daniel, 2015). A sample size calculation was not applicable in this study, however, to enable for robust analysis the study aimed to recruit 100 men and women in each area (n=400).

A sample size calculation was not applicable in this study. Samples of 100-200 MSM are common in GSN app research (e.g. Gibbs and Rice, 2016; Goedel et al., 2016b; Goedel et al., 2017c; Duncan et al., 2018a) and surveys with larger samples (>250 MSM), tend to be large national government-funded projects (Cabecinha et al., 2017; Badal, 2018) or recruit through sexual health clinics (Beymer et al., 2014; Chan et al., 2018) or GSN apps themselves (Landovitz et al., 2013; Holloway et al., 2015; Griffiths et al., 2018; O'Connor et al., 2018). To enable for robust analysis, the study aimed to recruit 100 men and women in each area (n=400).

### 4.3.2 Second phase sampling – purposive sampling

Due to the challenges with Facebook advertising (see section 4.3.3.1 and reflection box 4.4), the sampling method was expanded to include purposive, community sampling. The final recruitment framework was a mix of stratified, probability sampling (Facebook advertising) boosted with purposive sampling (adverts through online LGBTQ+ resources and some snowballing). Purposive or non-probability sampling, tends to have greater selection bias and limits the use of inferential statistics; however, it does have benefits when recruiting from small, high risk groups. Both the stratified and purposive sampling methods are likely to be affected by volunteer bias; those who completed the survey may have a special interest in the topic or special characteristics that affect the findings (Meyer and Wilson, 2009).

### 4.3.3 Recruitment methods

Recruiting a large and representative sample of LGBTQ+ individuals is challenging (Fish, 1999; Hickson et al., 2017a; Semlyen and Hagger-Johnson, 2017) so novel recruitment methods were employed.

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<sup>14</sup> The survey was originally open to anyone who lived within Liverpool City Region (LCR). This covers a slightly larger footprint than Merseyside as LCR also includes the local authority of Halton. However, I realised no population or health data are available for LCR and few people understand the parameters of LCR. This was changed for the second phase of sampling (section 4.3.2) to make it clearer on recruitment materials. Only five participants from Halton completed questionnaires and the majority of surveys and all interviews were advertised to Merseyside residents.

#### 4.3.3.1 Facebook recruitment (stratified sampling)

A Study Facebook Page was set up to promote the research, provide information about the study and from which to launch the adverts (see appendix B for full description of the page and Facebook advertising). Targeted recruitment through commercial Facebook advertising was originally chosen as it is particularly effective for reaching young and hard-to-reach groups (Whitaker et al., 2017) and it should have been effective at reaching LGBTQ+ app users who tend to be younger, tech-savvy and high users of social media. Facebook advertising should have also provided a structured stratified sampling method and allowed for a valid comparison between the behaviour of app-users in the UK and the USA.

#### Facebook recruitment in health research

When this programme of research started, Facebook advertising was becoming an increasingly popular and effective method to recruit people to health research. A systematic review by Whitaker et al. (2017) found that, compared with traditional recruitment methods (print, radio, television, email, etc.), Facebook advertising reduced costs, shortened recruitment periods and gave better representation. Facebook advertising is particularly cost-effective because it uses algorithms to target specific adverts at appropriate users based on their previous Facebook activity.

In the Whitaker et al. (2017) review, costs for advertising varied dramatically depending on the type of study, target population and advertising settings (\$1.36 – \$76.13 per eligible recruited participant). The cost per enrolled participant was higher (approx. \$40-76) when physical attendance at clinics was required or for interventions or clinical trials, for example physical activity interventions and longitudinal studies (Musiat et al., 2016; Moreno et al., 2017; Schwinn et al., 2017). Cost per enrolled participants were lower (approx. \$1-4) in studies using online surveys and were particularly effective in studies aimed at specific hard-to-reach groups.

#### Reflection box 4.3: “Why not recruit through the apps?”

I originally chose Facebook recruitment to ensure as broad and wide sample as possible, despite suggestions from supervisors and colleagues and evidence showing recruiting MSM through apps is more efficient than other recruitment methods (Zou and Fan, 2017). Recruitment through apps was just not an option for three reasons.

Firstly, most apps don't let you buy advertising space. None of the apps used by women sell advertising. The main one that does, Grindr, is very expensive. In 2014 we purchased Grindr adverts to recruit interview participants for an LGBT needs assessment in Warrington (a town in Northern England; Madden, 2014). Grindr's minimum budget for an advertising campaign was £600 and this purchased three of days of adverts in a geographically small area. The price is likely to have increased dramatically since 2014, and across two countries would have been beyond the budget of this research

Secondly, apps are extremely cautious about the adverts they allow. In 2014, the Grindr sales rep warned me because of recent bad press we could not include survey questions about risky behaviour. They were worried about headlines linking Grindr with unprotected sex or STI diagnosis, but they were fine with us recruiting to interviews and asking a very brief survey about health services in Warrington. It looks like even studies that do recruit through Grindr are prohibited from publicising this fact. Three recent studies appear to have recruited through Grindr ads but the authors have been vague in the methods and refer to adverts placed on “a popular GSN app for men”, presumably, this was a condition of advertising (Goedel et al., 2016a; Griffiths



et al., 2018; Goedel et al., 2019). Earlier studies created Grindr profiles and invited users to take part in research (Holloway et al., 2015; Gibbs and Rice, 2016). However, Grindr's terms of service now explicitly state users are not allowed to solicit "*surveying or requests to participate in surveys or studies*" (Grindr, 2018). This method of approaching users through a fake profile is also ethically ambiguous and other apps are cautious of this too. This is not the case for all apps and a recent study in China worked with the biggest Chinese MSM app, Blued, and recruited a very large sample (n=9,280; Luo et al., 2019). Three of the study authors are affiliated with the apps holding company Blue City, who promote themselves as a social enterprise who actively run HIV/AIDS prevention and anti-discrimination campaigns.

The third problem with recruiting via Grindr is it would mean a sample dominated by Grindr users. Not only would this exclude women, but a third of the MSM in our survey stated they had previously had a Grindr profile but now deleted it (see section 5.3). Our findings show different apps were used for different purposes and focusing only on Grindr users would miss, for example, the Scruff users who had higher numbers of sexual partners.

### **Effectiveness of Facebook adverts in this study**

A detailed explanation of Facebook advertising and the process for this study is included in appendix B. Eleven adverts ran in March and April 2018 and led to 144 completed surveys. Two of these surveys were excluded from analysis, as the participants had not used a GSN app in the last 12 months to meet same-gender partners. The initial budget for advertising was £600. Less than 50% of the budget was used when Facebook stopped approving adverts. In early May 2018, Facebook started "disapproving" all recruitment adverts, wording was changed and the rejections were appealed. Facebook did not respond to any of these appeals. A further nine adverts were submitted in May and June 2018 all of which were "disapproved" by Facebook. A decision was taken to abandon Facebook advertising in June 2018 (see reflection box 4.4).

A total of £248.40 was spent on valid adverts; £115.99, (47.7%) in the UK and £132.21 in USA. The adverts were considerably cheaper and more cost effective in the UK. The mean cost per click was higher in USA (£0.50 per user clicking the ad), compared to UK (£0.39). A higher proportion of UK users completed the survey when they clicked through to the online participant info sheet (44%), compared to USA users (28%). Therefore, the cost per completed survey was over four times higher in USA compared to the UK; the mean cost per completed survey was £1.04 in Merseyside and £4.41 in CT. Possible reasons for this are discussed in reflection box 4.4. The cost also varied greatly between adverts, even within the same country, and it was unclear why. In the UK, the cost per completed survey varied from £0.24 to £6.59, depending on type of ad, date, wording and other indiscernible factors. In the USA the cost varied from £2.56 to £8.75 per completed survey.

According to the Facebook insights, the adverts were seen 34,714 times, and 68% of these impressions were in the UK. Adverts were liked 200 times, 80% of these likes came from the US. Mean age of the respondents who completed the survey after seeing a Facebook ad were similar in the UK (26.1 years) and USA (25.8 years).

### **4.3.3.2 Community recruitment (purposive sampling)**

After commercial Facebook adverts stopped being approved, recruitment methods were expanded to include promotion of the study through community channels. A list of community groups who work with LGBTQ+ people in each area was compiled from internet searches, Facebook searches, word of mouth and existing networks.



A recruitment advert was designed to include all the information within the picture; in case the organisations did not include text (see figure 4.2). This additional recruitment was focused mainly in Connecticut to bring the US sample up to a similar number as the UK.

The Connecticut advert was shared on 11 Facebook pages/groups who have approximately 20,425 Likes (e.g. Hartford Lesbian & Gay Health Collective, Queer Exchange New Haven, New Haven Pride Center, Queer Exchange Connecticut). The Merseyside advert was shared on four Facebook pages/groups with approximately 7,750 Likes (e.g. Liverpool Pride, Liverpool LGBT Choir and Liverpool LGBT Network; see appendix D). These are not unique individuals as people follow/like many groups and there will be crossover.

Instagram was also used to promote the survey. The image was uploaded to the researcher's personal Instagram account with a selection of hashtags relevant to the LGBTQ+ community in Connecticut<sup>15</sup>. The link to the survey was included in the user's biography. The posts were tagged as being posted in Connecticut to generate local interest. Three CT posts were "liked" 86 times people, though there was crossover on the three posts.

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<sup>15</sup> The hashtags on each post included: #gay #gayct #CTgay #gradlife #phd #connecticutgay #gayconnecticut #Connecticut #lesbianconnecticut #scruff #grindr #HER #tinder #intsagay #gayhartford #hartfordct #hartford #newhavenct #queer #phdlife #healthresearch #publichealth.

#### Reflection box 4.4: Facebook advertising challenges

When I was designing this study in 2017, on paper, Facebook advertising looked perfect. I needed a way to promote the research in Connecticut without having yet built community connections and networks. However, it proved to be very challenging.

*Cambridge Analytica Ltd.* Just after I launched the first test ad, news broke about Cambridge Analytica using Facebook data to influence the US presidential campaign and the EU referendum. Suddenly Facebook was an enemy, media discussed the role of Facebook's data security and people deleted their Facebook accounts feeling manipulated and suspicious. In the middle of this I'm trying to get Facebook users to tell me about their sex and relationships!

*More expensive in the US.* I had been advised that Facebook ads were more expensive in the USA compared to other countries, so I was expecting to spend more in Connecticut. However, I was naïve. Recruitment in the US was very expensive and painfully slow. As Facebook gives so few details about the ads and their algorithms I could only speculate on the reasons. I suspected the people were suspicious of how the data would be used so I changed the ads so they mentioned the name of the university and reassured of confidentiality and anonymity; but this did not improve completion rates. Fewer of the Connecticut respondents who clicked the link completed the survey (28%), I suspect this was because they do not recognise the LJMU logo and have never heard of "Merseyside". The long dense text of the PIS may have been prohibitively long. However, the template from REC is not flexible so I had no choice.

*Refusing to approve adverts.* Every time you launch an advert, even if identical to a previously used advert, it has to be approved by Facebook before it will go live. I was extremely confused by the logic of which adverts Facebook would approve or not. On one day an identical advert was approved in Merseyside but rejected in Connecticut. There is one advertising policy covering the UK and the US - were they applying it differently? I suspect I was "blacklisted" to some degree. The last ad was approved on the 26th April 2018. After that, all ads stopped being approved, despite being identical to earlier ads. Were Facebook clamping down on any potentially controversial ads due to bad press? Eventually I had to admit defeat and give up the recruitment plan. The Ad Manager account was linked to my personal Facebook account – I didn't want to risk being kicked off Facebook. Having to abandon this recruitment method was extremely disappointing and I had to totally rethink my recruitment technique.

*General adverts and marketing in the US.* One thing that surprised me when I was living in Connecticut in 2018 was the sheer number of adverts everywhere. When I logged onto my social media in Connecticut I realised my recruitment adverts may have got totally lost in a sea of constant adverts. As I scrolled down my Facebook it felt like every other post was a sponsored advert. It isn't just social media; US television has many more adverts than the UK and there were billboards and TVs along all the roadside. Other than a bigger advertising budget there is unlikely to be a way round this for research recruitment. Maybe one becomes desensitised to all these adverts and stops seeing them?

*Pictures and text in Facebook ads.* When you make an advert the Facebook algorithms check it to see if it complies with their rules. I regularly got warnings that the photo included too much text. Even only four words and the LJMU logo came back as too many. Facebook kept suggesting I "focus on the product or service" – it was difficult to provide a photo that summed up my research, didn't use any words and didn't infringe copyright rules. A simple photo might work to get attention for a product but my adverts were trying to persuade people to provide personal information to me. A key principle of research ethics is to provide participants with information upfront, which the format of Facebook commercial advertising restricts. The community recruitment image with detailed text laid over simple graphic (figure 4.2) yielded lots of responses suggesting potential participants want this information.

Figure 4.2: Example JPEG advert for survey shared by community organisations on social media

**LIVERPOOL JOHN MOORES UNIVERSITY**

designed by freepik.com

**DATING APP RESEARCH**  
*We are recruiting ...*

Do you live in Merseyside?  
 Do you use smartphone apps to find partners of the same gender?  
 Are you age 18 or over?

**INVESTIGATING HOW PEOPLE USE SMARTPHONE APPS TO MEET SAME GENDER PARTNERS - COMPARING USA & UK**

10-15min online survey for anyone who uses dating apps to find same gender partners.  
 All data confidential & anonymous.  
 Please take part, whatever your gender:

[bit.ly/datingappresearch](https://bit.ly/datingappresearch)

Or contact Hannah for more info on:  
 fb.me/datingappresearch  
 h.c.madden@LJMU.ac.uk

Research conducted by: Hannah Madden, PhD Candidate at  
 Institute of Public Health, Liverpool John Moores University, UK  
 and  
 Public Health Dept, Southern Connecticut State University, USA

#### 4.3.3.3 Differences between recruitment methods

The majority of the participants (142, 69%; 112 in MS, 30 in CT) were recruited through the commercial Facebook advertising (table 4.2). The community adverts (mainly shared on social media) were much more effective in CT than commercial Facebook advertising; over two thirds of CT participants were recruited through community adverts.

There were no significant differences in the gender or sexual orientation of the participants recruited by the two methods ( $p > 0.05$ ). The participants did differ significantly in terms of age; those recruited through commercial Facebook advertising were younger ( $Mdn = 22.5$ ) than those recruited through community groups ( $Mdn = 28$ ). However, the age of participants in CT and MS did not differ significantly (section 5.1)

Table 4.2: Demographic characteristics of participants recruited through commercial Facebook advertising and community recruitment (n, %).

	Commercial Facebook ads	Community adverts	Total	p-value
<b>Gender</b>				0.115 <sup>16</sup>
Woman	53 (38.1)	31 (47.7)	84 (41.2)	
Men	78 (56.1)	27 (41.5)	105 (51.5)	
Non-binary/Genderqueer/Other	8 (5.8)	7 (10.8)	15 (7.4)	
Missing	3	0	0	
<b>Area</b>				<0.001 <sup>17</sup>
Merseyside	112 (78.9)	21 (32.3)	133 (64.3)	
Connecticut	30 (21.1)	44 (67.7)	74 (35.7)	
Missing	0	0	0	
<b>Sexual Orientation</b>				0.551 <sup>18</sup>
Gay, lesbian or homosexual	104 (73.2)	45 (69.2)	149 (72)	
Bisexual/other/no term	38 (26.8)	20 (30.8)	58 (28)	
Missing	0	0	0	
<b>Age (Mdn, IQR)</b>	22.5 (20-28.75)	28 (25-37)	24 (21-32)	<0.001 <sup>19</sup>
<b>Total</b>	<b>142</b>	<b>65</b>	<b>207</b>	

## 4.4 Data analysis

Data were exported from Bristol Online Survey and cleaned, recoded and analysed in SPSS v25. Missing values were rare as all questions were mandatory, but included a *prefer not to say* option. Not all dimensions of the Outness Inventory were used for analysis. Only 36% (n=71) individuals completed the *Out to Religion* questions so these were not included. *Out to World* and *Out to Family* scores were used in analysis to examine different elements of “outness”.

Frequencies provided descriptive statistics where appropriate. The sample size was relatively small, and uneven between the two areas. Initial exploration of the data using histograms and boxplots showed the continuous data to be non-normally distributed (Field, 2009); thus medians and interquartile ranges were reported, rather than means and standard deviations (Lang and Altman, 2015). Non-parametric tests were used to investigate differences between groups (Field, 2009). Relationships between categorical variables were explored using Pearson’s chi-square tests for independence (Acton, 2009); the Fisher’s Exact test was used when the expected frequencies of 20% or more cells were less than 5 (Field, 2009). Post-hoc tests of significant chi-square results used adjusted standardised residuals, examining z scores.

Mann-Whitney tests were used to examine differences in median results of two categorical variables and Kruskal-Wallis tests were used for three or more categorical variables. Further Mann-Whitney tests were used post-hoc, to examine any significant differences found on Kruskal-Wallis tests. The Jonckheere-Terpstra test

<sup>16</sup>  $\chi^2(2)=4.3$

<sup>17</sup>  $\chi^2(1)=42.1$

<sup>18</sup>  $\chi^2(1)=0.4$

<sup>19</sup>  $U=2446, z=-4.6$

was used as a post-hoc test to explore any significant differences in hierarchical/ordered data (Ali and Abdur Rasheed, 2015). The alpha level on all tests was set to  $p < 0.05$ .

#### **Reflection box 4.5: Challenges with exploratory analysis**

I found the task of organising my analysis very difficult as the questionnaire was designed to explore a wide range of behaviours, characteristics and outcomes. When I started the analysis I tried to sort the variables into independent and dependent variables and quickly realised there was huge crossover and very few were specifically outcome variables.

I ended up with at least 25 key variables and was in danger of comparing everything against everything else, without any direction or aims. The original research aim and objectives for the quantitative study were very general, exploring all possible relationships and would inform the qualitative phase; this did not provide much guidance for an analysis plan. After discussion with supervisors, I went back to research aims and developed eight testable questions:

1. Which GSN apps are most popular?
2. Why do people use GSN apps?
3. What factors influence frequency of app use?
4. What factors are associated with using apps to meet opposite-gender partners?
5. What factors are associated with using multiple GSN apps?
6. What factors are associated with increased numbers of sexual partners?
7. Are participants meeting different types of partners on apps?
8. How do participants view the negatives and positives of using GSN apps?

With these specific questions in mind, the analysis became more manageable and structured. The findings are presented under these headings.

In retrospect, I should have included some very specific outcome/dependent measures in my survey, though most of the questions came from previous and validated surveys. On reflection, most variables could not be classified as only outcome variables; cause and effect were impossible to determine. For example – using multiple apps or using apps to see opposite-gender partners might be an outcome, or it might be a causal factor. At first glance frequency of app use appears to be an independent variable that might lead to more sexual partners. However, I came to realise during analysis that these two measures were correlated but the causal direction could go either way, or be informed by a third variable. If I was doing this again I could include a mediating measure, such as sexual sensation-seeking (Kalichman and Rompa, 1995), and use mediation analysis to understand the three-way relationship (MacKinnon et al., 2007).

In hindsight, I would also add more questions relating to how participants felt apps had changed their behaviour, or included some more specific health outcomes – though again standard sexual health outcomes are very difficult to use for all genders (see section 4.2.2).

Standardised residuals and post-hoc Mann-Whitney tests used the Bonferroni correction to reduce the chance of a type one error ( "*type one error occurs when we believe there is a genuine effect in a population when in reality, there isn't*"; Field, 2009, p.782)). The Bonferroni correction ensures the significance testing is stricter by dividing the alpha level ( $p < 0.05$ ) by the number of tests conducted.

Pearson's correlations were used to examine relationships between two continuous variables. Forward binary logistic regression was used to examine which variables predicted some binary categorical outcomes, only variables where univariate analysis showed significance of  $p < 0.1$  were inputted into the model. All models were then confirmed by backward binary logistic regression.

The four open text boxes were imported into NVivo along with key demographic measures. For each question the text was coded into themes using thematic analysis (Braun and Clarke, 2006; Braun et al., 2018; see section 6.7.2 for full description of thematic analysis). The case classification feature of NVivo was used to compare codes between areas, genders and sexual orientation. Illustrative quotes are provided and any differences between themes reported.

The results of the survey are presented and discussed in the following chapter.

## Chapter Five | Survey Findings and Discussion (Study 1)

This chapter outlines the findings from the cross-sectional online survey with GSN app users in Connecticut and Merseyside; the subheadings state the main research questions for this study and a discussion is included at the end.

### 5.1 Survey participation

A total of 207 responses were included in the analysis. Eighty-seven participants exited the survey before completion (30% of those who started it; see reflection box 4.2). Bristol Online Surveys does not record the responses of those who drop out so we cannot know how these participants compare to those who are included in the final analysis. Five participants were excluded from final analysis – two lived outside of CT or MS and three had not used a GSN app in the last 12 months to meet same-gender partners. The first page of the survey (including the participant information sheet) was viewed 1,763 times, although some of these were by the researcher checking the link. This translates to an estimated completion rate of 12%.

### 5.2 Demographic characteristics

Table 5.1 shows sociodemographic characteristics of survey respondents, by area. Nearly two-thirds of the respondents to the survey (64%) were from MS. Participants in CT and MS differed significantly in gender and sexual orientation. In MS the largest proportion of respondents were men (58%) whereas in CT it was women (46%). CT respondents referred to their sexual orientation and gender in less binary terms; a significantly higher proportion of CT respondents identified as a gender other than man or woman (14%), compared to MS (4%). A significantly higher proportion of CT respondents reported a trans history (22%) compared to MS (5%). Similarly, a significantly higher proportion of CT respondents reported their sexual orientation as “other” or “I don’t usually use a term” (16%). Due to the relatively small number of those identifying as bisexual, other or “I don’t usually use a term” these were grouped into one category in further analysis, often referred to as “plurisexual”. There were no significant differences between the proportion of women in CT and women in MS who used a term other than gay, lesbian or homosexual ( $p < 0.05$ ; data not shown), however a higher proportion of men in CT (20%) compared to MS (5%) indicated they were not gay or homosexual ( $p < 0.05$ ; data not shown).



Table 5.1: Socio-demographic characteristics of survey respondents, by area, n (%)

	Merseyside	Connecticut	Total	P-value <sup>x</sup>
<b>Gender</b>				<b>&lt;0.01</b>
Woman	50 (38.5)	34 (45.9)	84 (41.2)	
Men	75 (57.7)	30 (40.5)	105 (51.5)	
Non-binary/Genderqueer/Other	5 (3.8)	10 (13.5)	15 (7.4)	
Missing	3	0	3	
<b>Trans History</b>				<b>&lt;0.001</b>
Cis	125 (95.4)	57 (78.1)	182 (89.2)	
Trans-history	6 (4.6)	16 (21.9)	22 (10.8)	
Missing	2	1	3	
<b>Sexual Orientation</b>				<b>&lt;0.01</b>
Gay, lesbian or homosexual	103 (77.4)	46 (62.2)	149 (72)	
Bisexual	24 (18)	16 (21.6)	40 (19.3)	
Other/I don't usually use a term	6 (4.5)	12 (16.2)	18 (8.7)	
Missing	0	0	0	
<b>Age</b>				<i>0.100</i>
18-24	71 (55.9)	29 (40.3)	100 (50.3)	
25-34	29 (22.8)	26 (36.1)	55 (27.6)	
35-44	15 (11.8)	11 (15.3)	26 (13.1)	
45-54	10 (7.9)	3 (4.2)	13 (6.5)	
55+	2 (1.6)	3 (4.2)	5 (2.5)	
Missing	6	2	8	
Range	18-55	18-66	18-66	
Median (IQR)	23 (20-32)	26.5 (22-33.75)	24 (21-32)	<i>0.86</i>
Mean (SD)	27 (9.5)	28.9 (10.1)	27.8 (9.7)	
<b>Ethnicity/Race</b>				<b>&lt;0.001</b>
White	126 (95.5)	52 (72.2)	178 (87.3)	
Person of colour	6 (4.5)	20 (27.8)	26 (12.7)	
Missing	1	2	3	
<b>Level of education</b>				<b>&lt;0.001</b>
A levels/GED or lower	51 (39.2)	10 (13.5)	61 (29.9)	
Further education/some college	15 (11.5)	25 (33.8)	40 (19.6)	
Undergrad/bachelors	47 (36.2)	21 (28.4)	68 (33.3)	
Post grad	17 (13.1)	18 (24.3)	35 (17.2)	
Missing	3	0	3	
<b>Total</b>	<b>133 (64.3)</b>	<b>74 (35.7)</b>	<b>207</b>	

Participants from MS reported leaving education earlier, only 14% of CT respondents had finished education at 18 (GED) compared to 39% of MS respondents (A-Levels,  $p < 0.001$ ; Table 5.1). Participants did not differ significantly in terms of age; median age in MS was 23 years old and CT was 26.5 years ( $p = 0.86$ ). The majority of participants in both areas were white. However, CT had a significantly larger proportion of participants of colour (28%); reflecting the ethnic make-up of the population.

<sup>x</sup> Compared using Pearson's chi-square test

Table 5.2: Social and health behavioural characteristics of survey respondents, by area, n (%)

	Merseyside	Connecticut	Total	P-value
<b>Proportion of friends who are LGBT</b>				<b>&lt;0.05<sup>x</sup></b>
More than half	41 (30.8)	28 (37.8)	69	
Half/less than half	56 (42.1)	38 (51.4)	94	
None/almost none/unsure	36 (27.1)	8 (10.8)	44	
Missing	0	0	0	
<b>Member of a group discriminated against</b>				<b>&lt;0.001<sup>x</sup></b>
Discriminated	62 (47)	60 (82.2)	122	
Not discriminated	70 (53)	13 (17.8)	83	
Missing	1	1	2	
<b>Gender of sexual partners, last 12m</b>				<b>&lt;0.01<sup>x</sup></b>
No-one	14 (10.8)	9 (12.2)	23 (11.3)	
Same gender only <sup>20</sup>	95 (73.1)	38 (51.4)	133 (65.2)	
One other gender only <sup>21</sup>	9 (6.9)	8 (10.8)	17 (8.3)	
Two or more genders	12 (9.2)	19 (25.7)	31 (15.2)	
Missing	3	0	3	
<b>HIV Status</b>				<b>0.961<sup>x</sup></b>
Positive	2 (1.5)	1 (1.4)	3 (1.5)	
Negative	116 (87.9)	66 (89.2)	182 (88.3)	
Unsure	14 (10.6)	7 (9.5)	21 (10.2)	
Missing	1	0	1	
<b>Outness scores</b>				
Out to family (M, SD)	5.3 (1.7)	5.1 (1.7)	5.2 (1.7)	<b>0.335<sup>k</sup></b>
Out to world (M, SD)	5.4 (1.6)	5.1 (1.6)	5.3 (1.6)	<b>0.094<sup>k</sup></b>
<b>Total</b>	<b>133 (64.3)</b>	<b>74 (35.7)</b>	<b>207</b>	

Table 5.2 shows social and health behavioural characteristics of survey respondents, by area. In total, only three individuals reported being HIV positive and similar proportions in both areas were unsure of their status. Participants in CT reported significantly higher proportions of their friends were LGBTQ+ ( $p < 0.05$ ), with only 11% saying they had no LGBTQ+ friends, almost none or were unsure how many of their friends were LGBTQ+ ( $p < 0.05$ ). A higher proportion of participants in CT felt they were a member of a group discriminated against in their country (82%) compared to 47% in MS ( $p < 0.001$ ). Respondents in CT reported a more diverse range of sexual partners; only 51% of CT participants reported sex with only same-gender partners in the last 12 months compared to 73% of MS participants.

The sexual orientation of survey respondents was compared with who they were sexually attracted to and the gender of their sexual partners in the previous 12 months (figures 5.1 and 5.2). As discussed in section 2.2.2 there is often a discrepancy between these three measures.

<sup>x</sup> Compared using Pearson's chi-square test

<sup>20</sup> Partner same gender as participant

<sup>21</sup> Partner of different gender to themselves (n.b. gender is not binary)

<sup>k</sup> Compared using Kruskal-Wallis test

Figure 5.1: Sexual orientation by sexual partners in the last 12 months (n, %)



Figure 5.1 shows the gender of sexual partners by sexual orientation; this question was answered by 204 participants. The majority people who identified as gay, lesbian or homosexual (n=121, 82%) had only had sex with same-gender partners in the previous 12 months. Only 12 people (8%) who identified as lesbian, gay or bisexual had had sex with partners of other genders than their own. The gender of partners of those who were plurisexual or used no term was more diverse with almost half (n=26, 46%) having sex with two or more genders.

Figure 5.2: Sexual orientation by sexual attraction (n, %)

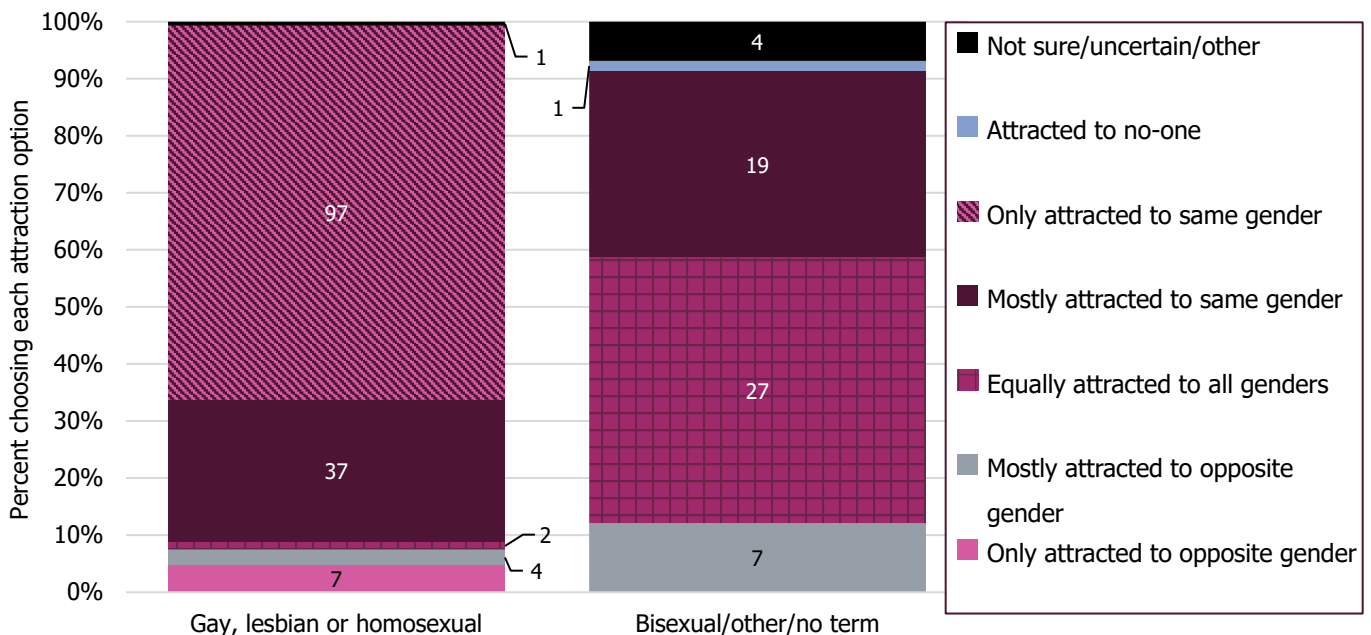


Figure 5.2 shows sexual attraction by sexual orientation group, this question was answered by 204 participants. The majority of those who identified as gay, lesbian or homosexual reported being attracted to only or mostly the same gender (134, 91%). As with sexual partners the experience of plurisexual people was more diverse.

Both figures 5.1. and 5.2 showed little discrepancy between gay, lesbian or homosexual identity and sexual attraction or behaviour. Therefore further analysis will be conducted using the simple binary sexual identity variable, rather than attraction or gender of partners.

*Table 5.3: How apps were used by survey respondents, by area, n (valid %)*

	Merseyside	Connecticut	Total	P-value
<b>Also use apps to find opposite-gender partners</b>				
Use to find opposite-gender partners	16 (12.2)	20 (27.8)	36 (17.7)	<b>&lt;0.01<sup>x</sup></b>
Do not use to find opposite-gender partners	115 (87.8)	52 (72.2)	167 (82.3)	
Missing	2	2	4	
<b>Proportion LGBTQ+ friends using apps</b>				<b>0.676<sup>x</sup></b>
All/most	52 (39.1)	25 (33.8)	77 (37.2)	
Many/some	43 (32.3)	28 (37.8)	71 (34.3)	
A few/none/unsure	38 (28.6)	21 (28.4)	59 (28.5)	
Missing	0	0	0	
<b>Number of GSN apps ever used</b>				
≤ 3 apps ever used	70 (52.6)	37 (50)	107 (51.7)	<b>0.717<sup>x</sup></b>
≥ 4 apps ever used	63 (47.4)	37 (50)	100 (48.3)	
Missing	0	0	0	
<b>Total number apps ever used, median (IQR)</b>	3 (2-5)	3.5 (0-11)	3 (0-11)	<b>0.85<sup>M</sup></b>
<b>Percent of sexual partners met on apps, Mdn (IQR)</b>	75 (0-100)	86.7 (0-100)	80 (0-100)	<b>0.91<sup>M</sup></b>
<b>No. years since they 1<sup>st</sup> started using GSN apps, Mdn (IQR)</b>	4 (0-10)	4 (0-10)	4 (0-10)	<b>0.66<sup>M</sup></b>
<b>Total</b>	<b>133</b>	<b>74</b>	<b>207</b>	

Table 5.3 shows how GSN apps were used by survey respondents, split by area. As may be expected from the demographic and social factors in tables 5.1 and 5.2, a significantly higher proportion of CT participants also used apps to find partners of a different gender to themselves (28% compared to 12% in MS;  $p < 0.01$ ). Apart from the gender of partners they were seeking, apps were used in very similar ways in the two areas. GSN app use was very common amongst LGBTQ+ friends of respondents with over a third reporting all or most of their LGBTQ+ friends used GSN apps. Approximately half of participants in both areas had used apps for less than 3 years and the median number of apps used was similar (3 in MS and 3.5 in CT,  $p > 0.05$ ). Although the proportion of sexual partners met via an app was slightly higher in CT (Mdn=86.7%) compared to MS (75%), this was not significant ( $p > 0.05$ ). In both areas the median number of years for which respondents had been using apps was 4 years ( $p > 0.05$ ). There were no significant differences between time since last STI or HIV test for men in CT compared to men in MS, or women in CT compared to women in MS ( $p < 0.05$ ; data not shown)

### 5.3 Which are the most popular GSN apps?

To understand if using specific apps is associated with demographic or behavioural characteristics, participants were presented with a list of 13 GSN apps<sup>22</sup> and for each asked to indicate:

1. *I have a current profile*
2. *I did have a profile but it is now deleted/deactivated*

<sup>x</sup> Compared using Pearson's chi-square test

<sup>M</sup> Compared using Mann-Whitney test

<sup>22</sup> App list was developed from literature review, researcher knowledge and expanded after piloting of the survey

3. *I have never had a profile*

4. *Prefer not to say*

The first two responses were recoded into “ever had a profile” and the final two responses recoded into “never had a profile/prefer not to say”.

### 5.3.1 Apps used by socio-demographic characteristics

*Table 5.4: Number of women who have ever used each app, n (%)*

App name	Women MS	Women CT	All Women	X <sup>2</sup>	p-value
Bumble	17 (34)	17 (50)	34 (40.5)	2.15	0.143
HER	29 (58)	23 (67.6)	52 (61.9)	0.80	0.371
POF/Plenty of Fish	30 (60)	14 (41.2)	44 (52.4)	2.88	0.09
Tinder	45 (90)	27 (79.4)	72 (85.7)	1.85	0.173
<b>Total in group</b>	<b>50</b>	<b>34</b>	<b>84</b>		

Table 5.4 shows no differences in the apps ever used by women in the two areas (men-specific apps not shown). The app most commonly used by women in both areas was Tinder (79% of women in CT and 90% of women in MS;  $p=0.173$ ). POF was the second most used app in MS (60%), however, fewer women in CT had ever had a POF profile (41%;  $p=0.09$ ). HER had been used by a higher proportion of women in CT (68%) than women in MS (58%) though again this was not significant ( $p=0.371$ ).

*Table 5.5: Number of men who have ever used each app, n (%)*

App name	Men MS	Men CT	All Men	X <sup>2</sup>	P-value
Bender	9 (12)	4 (13.3)	13 (12.4)	0.04	1 <sup>α</sup>
Blued	4 (5.3)	3 (10)	7 (6.7)	0.75	0.405 <sup>α</sup>
Bumble	9 (12)	6 (20)	15 (14.3)	1.12	0.356 <sup>α</sup>
Grindr	70 (93.3)	27 (90)	97 (92.4)	0.34	0.686 <sup>α</sup>
Growlr	23 (30.7)	11 (36.7)	34 (32.4)	0.35	0.553
Happn	8 (10.7)	3 (10)	11 (10.5)	0.01	1 <sup>α</sup>
Hornet	37 (49.3)	13 (43.3)	50 (47.6)	0.31	0.578
Jackd	25 (33.3)	10 (33.3)	35 (33.3)	0.00	1
POF/Plenty of Fish	30 (40)	6 (20)	36 (34.3)	3.80	0.51 <sup>α</sup>
Planet Romeo	22 (29.3)	2 (6.7)	24 (22.9)	6.24	<0.05 <sup>α</sup>
Scruff	44 (58.7)	17 (56.7)	61 (58.1)	0.04	0.851
Tinder	59 (78.7)	21 (70)	80 (76.2)	0.89	0.346
<b>Total in group</b>	<b>75</b>	<b>30</b>	<b>105</b>		

Table 5.5 shows the apps used by men in MS and CT were also very similar (women-specific apps not shown). The majority of men in both areas (92%) had ever had a Grindr profile. Tinder was the second most popular app in men (76%). In both areas, Scruff was the third most commonly used app (59% in MS and 57% in CT). Only one app showed significant differences in use between the two areas; 29% of men in MS had used Planet Romeo compared to 7% in CT ( $p<0.05$ ). Further analysis of the Grindr users found that 60% of men had a current profile, 32% had a profile but it is now deleted/deactivated and 8% had never had a Grindr profile. This did not differ by area ( $p>0.005$ ; data not shown).

The five most popular apps (Tinder, Grindr, POF, Scruff and HER) were included in further analysis to understand how demographic characteristics are associated with patterns of app use. Only participants of the

<sup>α</sup> Using Fisher's Exact as  $\geq 20\%$  cells had expected count less than 5.

gender the app was aimed at were included in analysis; Tinder and POF analysis included all participants, Grindr and Scruff analysis included only those who identified as men and HER analysis included only women.

*Table 5.6: Participants who have ever had a profile on each app, by sexual orientation, n (% of each characteristic who have used each app)*

App name	Gay, lesbian or homosexual	Bisexual/other/ no term	Total app users	$\chi^2$	P-value
<b>Tinder</b>	112 (75.2)	56 (96.6)	168	12.49	<b>&lt;0.001</b>
<b>Grindr<sup>23</sup></b>	89 (93.7)	8 (80)	97	2.41	0.168 <sup>α</sup>
<b>POF/Plenty of Fish</b>	61 (40.9)	23 (39.7)	83	0.3	0.87
<b>Scruff<sup>23</sup></b>	58 (61.1)	3 (30)	61	3.58	0.09 <sup>α</sup>
<b>HER<sup>24</sup></b>	31 (64.6)	21 (58.3)	52	0.34	0.559

Table 5.6 shows Tinder is the only app that shows significant differences in use by sexual orientation groups; a higher proportion of these who identified as bisexual/other/no term (97%) had ever had a Tinder profile, compared to those who identified as gay, lesbian or homosexual ( $p < 0.001$ ).

*Table 5.7: Median age of users and non-users of each app, Mdn (IRQ)*

App name	Had profile	Never had Profile	Total app users	Mann-Whitney U	p-value
<b>Tinder</b>	23 (20-28)	38.5 (29.75-47.75)	168	825	<b>&lt;0.001</b>
<b>Grindr<sup>23</sup></b>	24 (20-33.25)	32 (25-41)	97	253	0.125
<b>POF/Plenty of Fish</b>	27 (21-35)	24 (20-30)	83	4008.5	0.053
<b>Scruff<sup>23</sup></b>	30 (21-35)	23 (20-28)	61	935	<b>&lt;0.05</b>
<b>HER<sup>24</sup></b>	24.5 (20.75-32)	24.5 (20.75-38.5)	52	728.5	0.830

Table 5.7 shows median age of users of the top five apps. Tinder users were significantly younger ( $Mdn=23$ ) than non-users ( $Mdn=38.5$ ;  $p < 0.001$ ) and men who used Scruff were significantly older ( $Mdn=28$ ) than men who had never used Scruff ( $Mdn=23$ ;  $p < 0.05$ ). The use of the top five apps was also compared with education level and proportion of friends who are LGBTQ+ and showed no significant differences (data not shown).

### 5.3.2 Apps used by behavioural and health characteristics

Table 5.8 shows the number of participants who have ever used each app by behavioural characteristics. Those who started using apps 4 or more years ago were significantly more likely to have ever had a profile on Tinder, POF and Scruff. As expected, the more apps a participant has ever used, the more likely they are to have used four individual apps; Grindr, POF, Scruff and HER. The proportion of friends who use apps also seems to have an association with the apps aimed specifically at women; the higher the proportion of a woman's LGBTQ+ friends who use apps, the more likely she is to have ever had a HER profile ( $p < 0.01$ ). There were no significant differences between proportions of LGBTQ+ friends using app for the unisex or men focused apps ( $p > 0.05$ ). There was no difference in app use between those who used apps to find opposite-gender partners and those who did not seek opposite-gender partners on apps.

<sup>23</sup> Men only

<sup>α</sup> Using Fisher's Exact as  $\geq 20\%$  cells had expected count less than 5

<sup>24</sup> Women only

Table 5.8: Number of participants who have ever had a profile on each app, by behavioural characteristics, *n* (% of each characteristic who have used each app)

	Tinder	Grindr <sup>25</sup>	POF/ Plenty of Fish	Scruff <sup>25</sup>	HER <sup>26</sup>
<b>Use apps to find opposite gender partners</b>	<i>p</i> =0.068	<i>p</i> =0.170 <sup>α</sup>	<i>p</i> =0.969	<i>p</i> =0.312	<i>p</i> =0.776
Yes	33 (91.7)	8 (80)	15 (41.7)	4 (40)	13 (65)
No	131 (78.4)	88 (93.6)	69 (41.3)	57 (60.6)	38 (61.3)
<b>Years on apps</b>	<i>p</i> <0.05	<i>p</i> =0.456 <sup>α</sup>	<i>p</i> <0.05	<i>p</i> <0.001	<i>p</i> =0.519
3 years or fewer	82 (88.2)	33 (89.2)	30 (32.3)	13 (35.1)	28 (59.6)
4 years +	81 (76.4)	65 (93.8)	51 (48.1)	47 (72.3)	22 (66.7)
<b>No. apps used</b>	<i>p</i> =0.085	<i>p</i> <0.05	<i>p</i> <0.001	<i>p</i> <0.001	<i>p</i> <0.001
≤3 apps ever used	82 (76.6)	30 (83.3)	29 (27.1)	7 (19.4)	29 (50)
≥4 apps ever used	86 (86)	67 (97.1)	55 (55)	54 (78.3)	23 (88.5)
<b>Proportion of LGBTQ+ friends using apps</b>	<i>p</i> =0.236	<i>p</i> =0.317 <sup>α</sup>	<i>p</i> =0.453	<i>p</i> =0.718	<i>p</i> <0.01
All/most	67 (87)	46 (92)	34 (44.2)	31 (62)	20 (83.3)
Many/some	56 (78.9)	30 (88.2)	30 (42.3)	19 (55.9)	19 (65.5)
A few/none/unsure	45 (76.3)	21 (100)	20 (33.9)	11 (52.4)	13 (41.9)
<b>Total users of each app</b>	<b>168</b>	<b>97</b>	<b>83</b>	<b>61</b>	<b>52</b>

Table 5.9: Median number of sexual partners in previous 12 months, by use of top five apps

			No. overall partners	No. app partners	Percent of sexual partners met on apps
<b>Tinder</b> ( <i>n</i> =168)	Never had a profile	Median (IQR)	2 (1-6)	1 (0-4.25)	66.7 (37.5-100)
		<i>n</i>	39	38	30
	Ever had a profile	Median (IQR)	3 (1-5)	2 (1-4)	80 (50-100)
		<i>n</i>	161	154	127
<b>Grindr<sup>25</sup></b> ( <i>n</i> =97)	Never had a profile	Median (IQR)	3.5 (2-4.75)	2 (1-8.5)	75 (50-100)
		<i>n</i>	8	8	7
	Ever had a profile	Median (IQR)	5 (2-12)	3 (1-9.25)	75 (50-100)
		<i>n</i>	93	90	81
<b>POF/ Plenty of Fish</b> ( <i>n</i> =83)	Never had a profile	Median (IQR)	2 (1-5)	<b>1 (0-3)*</b>	<b>66.7 (20-100)**</b>
		<i>n</i>	118	115	96
	Ever had a profile	Median (IQR)	3 (1-6)	<b>2 (1-6)*</b>	<b>83.3 (66.7-100)**</b>
		<i>n</i>	82	77	61
<b>Scruff<sup>25</sup></b> ( <i>n</i> =61)	Never had a profile	Median (IQR)	<b>3 (2-6.75)**</b>	<b>2 (1-6.5)**</b>	65.5 (47.5-100)
		<i>n</i>	42	41	34
	Ever had a profile	Median (IQR)	<b>5 (3-17)**</b>	<b>4 (2-13.5)**</b>	80 (60-100)
		<i>n</i>	59	57	54
<b>HER<sup>26</sup></b> ( <i>n</i> =52)	Never had a profile	Median (IQR)	<b>1 (0-1)***</b>	<b>0 (0-1)**</b>	100 (12.5-100)
		<i>n</i>	32	30	16
	Ever had a profile	Median (IQR)	<b>1 (1-3)***</b>	<b>1 (0-2)**</b>	66.7 (28.6-100)
		<i>n</i>	49	47	38

\*\*\*Difference is significant at the 0.001 level (2-tailed). \*\*Difference is significant at the 0.01 level (2-tailed). \*Difference is significant at the 0.05 level (2-tailed).

To understand if use of the top five apps was associated with higher numbers of sexual partners<sup>27</sup>, participants who had ever had a profile were compared with those who had never had a profile on three measures of sexual partners (table 5.9). Of all the apps users, men who had ever had a profile on Scruff reported the highest

<sup>25</sup> Only men included in analysis

<sup>26</sup> Only women included in analysis

<sup>α</sup> Using Fisher's Exact as 20% cells had an expected count less than 5.

<sup>27</sup> See section 5.7 for description of variables and further exploration of number of sexual partners



median number of overall partners (Mdn=5) and app partners (Mdn=4) in the previous 12 months. Women who had never used HER reported the lowest number of overall partners (Mdn=1) and app partners (Mdn=1).

Those who had ever had a POF profile had significantly higher numbers of app partners (Mdn=3) than those who had never used POF (Mdn=2,  $U=3665.5$ ,  $z=-2.055$ ,  $p<0.05$ ). Those who had ever had a POF profile also met a higher proportion of their sexual partners on apps (Mdn=67%) than those who had never used POF (Mdn=83%,  $U=2181.5$ ,  $z=-2.760$ ,  $p<0.01$ ). Men who used Scruff had higher number of overall partners (Mdn=5,  $U=830.5$ ,  $z=-2.825$ ,  $p<0.05$ ) and a higher number of app partners (Mdn=4) than men who had never used Scruff ( $U=849.5$ ,  $z=-2.31$ ,  $p<0.05$ ). However, the proportion of sexual partners met through an app did not differ for men who had used and had not used Scruff ( $U=779$ ,  $z=1.206$ ,  $p>0.05$ ).

HER was the only app on the list aimed at women (table 5.9). Women who had ever had a HER profile had significantly more overall partners (Mdn=1) compared to women who had never had a HER profile (Mdn=1;  $U=454.5$ ,  $z=-3.3$ ,  $p<0.001$ ). Women who used HER also reported a significantly higher number of app partners (Mdn=1) than women who had never used HER (Mdn=1;  $U=471.5$ ,  $z=2.59$ ,  $p<0.01$ ). No significant differences were seen between Tinder users and non-users or Grindr users and non-users on any of the three measures of sexual partners; most likely because so few users had never used these apps.

### 5.3.3 Number of apps used

To understand who is most likely to use multiple apps, chi-square tests compared demographic characteristics by the number of apps people had ever used. A new variable was calculated to classify participants into users of multiple apps (ever having a profile on 4 or more apps) and lighter users (ever having a profile on 3 apps or fewer). Full tables are presented in appendix E. Only gender, sexual orientation, proportion of LGBTQ+ friends who use apps and years on apps showed any association with using multiple apps (table 5.10).

Variables that were significant at  $p<0.1$  in univariate analysis were included in a forward, binary logistic regression model to predict use of multiple GSN apps. These were gender (women as reference group), sexual orientation (gay, lesbian or homosexual as reference), proportion of LGBTQ+ friends using apps (a few/none/unsure as reference) and years on apps (3 years or fewer as reference). Only one variable (sexual orientation) was not included in the final equation. Backwards logistic regression confirmed the final model. In the final model men were three times more likely to report using 3 or more apps than women (AOR=3.4, 95% CI 1.8-6.6). Participants who reported that all or most of their LGBTQ+ friends used GSN apps were two and a half times more likely than those who had very few friends using GSN apps, to report using 3 or more GSN apps (AOR=2.6, 95% CI=1.2-5.7). Those who had used apps for 4 years or more years were more than twice as likely than those who had used for 3 years or fewer to report using 4 or more apps (AOR=2.123, 95% CI=1.1-4).

Table 5.10: Multivariate, binary logistic regression of factors predicting numbers of apps used

	Univariate analysis			Multivariate analysis	
	3 apps or fewer ever used (n=107)	4 or more apps ever used (n=100)	p-value	AOR (95% C.I.)	p-value
<b>Gender</b>			<b>&lt;0.001</b>		
Women	58 (69)	26 (31)		<i>ref</i>	
Men	36 (34.3)	69 (65.7)		3.4 (1.8-6.6)	<b>&lt;0.001</b>
NB/genderqueer/other/prefer not to say	13 (72.2)	5 (27.8)		0.9 (0.3-3.1)	<i>0.919</i>
<b>Sexual orientation</b>			<b>&lt;0.001</b>	$\Psi$	
Gay, lesbian or homosexual	66 (44.3)	83 (55.7)			
Bisexual/other/no term	41 (70.7)	17 (29.3)			
<b>Proportion of LGBTQ+ friends using apps</b>			<b>&lt;0.001</b>		
All/most	26 (33.8)	51 (66.2)		2.6 (1.2-5.7)	<b>&lt;0.05</b>
Many/some	41 (57.7)	30 (42.3)		1.2 (0.5-2.6)	<i>0.646</i>
A few/none/unsure	40 (67.8)	19 (32.2)		<i>ref</i>	
<b>Years on apps</b>			<b>&lt;0.001</b>		
3 years or fewer	59 (63.4)	34 (36.6)		<i>ref</i>	
4 years or more	42 (39.6)	64 (60.4)		2.1 (1.1-4)	<b>&lt;0.05</b>

$\Psi$  Excluded from final equation

## 5.4 Why do people use GSN apps?

### 5.4.1 All reasons participants use GSN apps

Participants were presented with a list of five reasons for using GSN apps and asked to tick all that applied.

- I want to 'kill time' when bored
- I want to make friends with other gay and bisexual people
- I want to meet other gay and bisexual people to date
- I want to find a boyfriend/girlfriend or other romantic partner
- I want to meet other gay and bisexual people to have sex with

Most participants indicated they used apps for multiple reasons; only 9% of respondents only ticked one option (n=19) whereas 71% indicated three or more reasons. Almost a quarter of respondents (23%) ticked all five reasons. The median number of statements participants ticked was 3 (IQR=2-4); there were no differences in the number of statements ticked by men and women (U=4173, z=-0.649, p=0.516) or between areas (U=4703.5, z=-0.540, p=0.589; data not shown).

Table 5.11: All reasons for using GSN apps, *n* indicating yes to each statement (% of gender)

I want to:	Women	Men	Total (men & women)	X <sup>2</sup>	p-value	Total (all genders)
...find a boyfriend/girlfriend or other romantic partner	68 (81)	67 (63.8)	135	6.7	<b>&lt;0.01</b>	146
...meet other gay & bisexual people to date	66 (78.6)	65 (61.9)	131	6.1	<b>&lt;0.05</b>	144
...meet other gay & bisexual people to have sex with	42 (50)	81 (77.1)	123	15.2	<b>&lt;0.001</b>	134
...kill time when bored	43 (51.2)	79 (75.2)	122	11.8	<b>&lt;0.001</b>	130
...make friends with other gay & bisexual people	52 (61.9)	61 (58.1)	113	0.3	0.596	125

Table 5.11 shows the number of men and women agreeing with each statement about why they use GSN apps, and total agreeing with statement (all genders). Men were significantly more likely than women to say they use GSN apps to meet other gay and bisexual people to have sex ( $p < 0.001$ ). Three quarters of men said they also used apps to kill time when bored, this was the second least popular response for women ( $p < 0.001$ ). The highest proportion of women said they were using apps to find a boyfriend/girlfriend or other romantic partner (81%), a significantly higher proportion than men (64%;  $p < 0.01$ ). A significantly higher proportion of women (79%) also said they use apps to meet other gay and bisexual people to date than men (62%;  $p < 0.05$ ). There were no significant differences in all reasons for using GSN apps when comparing areas or sexual orientations (data not shown).

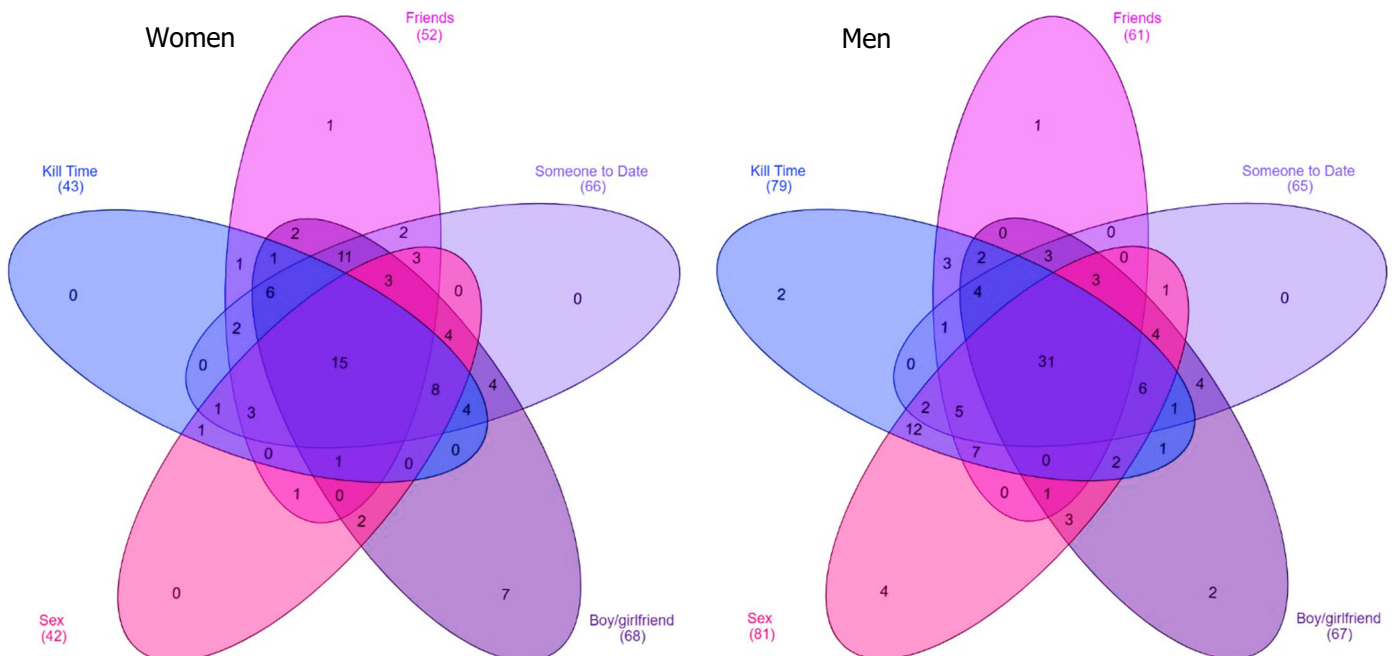
Figure 5.3: Any reason participants use GSN apps, number ticking each statement combination; women ( $n=84$ ) and men ( $n=105$ ) (produced using Heberle et al., 2015)

Figure 5.3 shows the crossover of reasons for using apps, for women and for men. This Venn diagram allows us to see the intersections of multiple reasons and understand how these cluster together by gender. For both women ( $n=15$ , 18%) and men ( $n=31$ , 30%) the most popular response was to tick they used apps for all five

reasons provided. For men, the second most common combination was to use apps to kill time/when bored and for sex (n=12, 11%) however, only one woman used it for these two reasons. For women the second most common combination was using apps to find friends, dates and a girl/boyfriends/romantic partner (n=11, 13%). No women used apps for the sole reason of killing time when bored or just for sex whereas some men did.

### 5.4.2 Main reason for using GSN apps

Participants were then offered the same list of five reasons for using GSN apps and asked to choose the main reason they used GSN apps.

*Table 5.12: Main reason for using apps by key participant demographic characteristics, n (%)*

	...‘kill time’ when bored	...make friends with other gay and bisexual people	...meet other gay and bisexual people to date	...find a boyfriend/girlfriend or other romantic partner	...meet other gay and bisexual people to have sex with	Total	X <sup>2</sup>	p-value
<b>Area</b>							7.1	0.129
Merseyside	21 (16)	8 (6.1)	23 (20.6)	43 (32.8)	32 (24.4)	131		
Connecticut	9 (12.3)	12 (16.4)	12 (16.4)	24 (37)	13 (17.8)	73		
<b>Gender</b>							21.1	<0.001
Woman	5 (6)	6 (7.2)	21 (25.3)	39 (47)	12 (14.5)	83		
Man	23 (22.1)	9 (8.7)	16 (15.4)	26 (25)	30 (28.8)	104		
<b>Sexual orientation</b>							2.1	0.721
Gay, lesbian or homosexual	23 (15.6)	15 (10.2)	26 (17.7)	53 (36.1)	30 (20.4)	147		
Bi/other/no term	7 (12.3)	5 (8.8)	13 (22.8)	17 (29.8)	15 (26.3)	57		
<b>Age group</b>							7.0	0.134
24 & younger	16 (16.3)	6 (6.1)	24 (24.5)	31 (31.6)	21 (21.4)	98		
25+	12 (12.2)	13 (13.3)	13 (13.3)	37 (37.8)	23 (23.5)	98		
<b>Total</b>	<b>30</b>	<b>20</b>	<b>35</b>	<b>67</b>	<b>55</b>	<b>207</b>		

Table 5.12 shows the main reason for using GSN apps by selected demographic factors. No other demographic factors were significant (data not shown). The only characteristic that appears to have a significant association with the main reason for using GSN apps was gender ( $p < 0.001$ ). Men had a broader range of main reasons for using GSN apps with the most popular reason being to find sex (29%). The most common reason for women was find a boyfriend, girlfriend or romantic partner (47%). Examination of standardised residuals showed only a small proportion of women (6%) used apps to “kill time when bored” compared to 22% of men and significantly more women (47%) used apps to find a romantic partner compared to men (25%)<sup>28</sup>.

<sup>28</sup> Standardised residuals: “kill time when bored” men vs women;  $z = -3.1$ ,  $p < 0.002$ , find boyfriend/girlfriend men vs women;  $z = 3.1$   $p < 0.002$ . The Bonferroni correction used to reduce the chance of a Type 1 error (Field, 2009) - critical value of  $p < 0.005$  (0.05 divided by the number of tests, 10).

Table 5.13: Mean outness score by main reason for using apps, compared using Kruskal-Wallis tests

Main reason for using apps. I want to:		Out to World	Out to Family
...‘kill time’ when bored	Mean (SD)	5.8 (1.38)	5.63 (1.46)
	n	30	30
...make friends with other gay and bisexual people	Mean (SD)	4.35 (1.47)	4.01 (1.83)
	n	20	20
...meet other gay and bisexual people to date	Mean (SD)	5.17 (1.81)	5.08 (1.84)
	n	39	39
...find a boyfriend/girlfriend or other romantic partner	Mean (SD)	5.42 (1.39)	5.58 (1.28)
	n	68	68
...meet other gay and bisexual people to have sex with	Mean (SD)	5.19 (1.84)	5 (1.99)
	n	45	45
Total	Mean (SD)	5.27 (1.62)	5.21 (1.7)
	n	202	202
X <sup>2</sup>		11.59	12.17
p-value		<b>p&lt;0.05</b>	<b>p&lt;0.05</b>

Table 5.13 shows significant differences on mean Outness Inventory scores between groups who had different main reasons for using apps. Those using apps to find friends had lower Outness score and were thus less “out” to their family or to the wider world (including friends, colleagues and strangers). Those whose main reason for using apps is to “kill time when bored” had higher mean outness scores on both dimensions. Participants whose main reason for using apps was to find friends had the lowest mean scores on both dimensions. Post-hoc tests<sup>29</sup> revealed that, for the Out to World indicator, participants reporting they used apps to make friends had significantly lower scores (and were therefore more “in the closet” with their friends and colleagues) than those that used apps to kill time and those that used apps to find a boyfriend/girlfriend or other romantic partners. The pattern was similar for the Out to Family scores; participants reporting that they used apps to make friends had significantly lower scores (and were therefore more “in the closet” with their family) than those that used apps to kill time or using apps to find a boyfriend/girlfriend or other romantic partners

### 5.4.3 Using different apps to find serious relationships or casual partners

Participants were asked *If you were looking for a serious relationship or boyfriend/girlfriend which app are you most likely to use?* Participants were offered the list of 13 GSN apps as well as “unsure”, “none of these”, “prefer not to say” and “other”. These are presented by gender within area in table 5.14.

Table 5.14: Four most popular apps when looking for a serious relationship or boyfriend/girlfriend, by area and gender, n (% of those who answered)

Women MS (n=50)		Women CT (n=34)		Men MS (n=75)		Men CT (n=30)	
HER	13 (26)	HER	9 (26.5)	Tinder	38 (50.7)	Tinder	11 (39.3)
Tinder	12 (24)	Other	8 (23.5)	None of these	18 (24)	None of these	5 (17.95)
POF	10 (20)	Unsure	5 (14.7)	Grindr	7 (9.3)	Unsure	4 (14.3)
Unsure	6 (12)	None of these	5 (14.7)	POF	4 (5.3)	Grindr	2 (7.1)

<sup>29</sup> Mann-Whitney tests. Out to World: friends vs kill time (U=136, Z=-3.263, p<0.005), friends vs find boy/girlfriend (U= 393.5, Z=-2.861, p<0.005). Out to Family: friends vs kill time (U=151, Z=-2.975, p<0.005), friends vs find boy/girlfriend (U= 333, Z=-3.469, p<0.001). To reduce the chance of a Type 1 error the Bonferroni correction was used, the critical value was p<0.0125 (p<0.05 divided by the number of comparisons, 4).

Half of men in Merseyside and two-fifths of men in CT said they would use Tinder to find a serious relationship. In both areas the second most common answer was “none of these” indicating that many men would not use an app to find a serious relationship. Only one man, from CT, suggested another app for a finding serious partners; Recon. There was less consensus for women; a quarter of women in CT and MS said they would use HER to find a serious relationship and a similar proportion said they would use Tinder or another app. In CT, eight women stated they would use OKCupid and in MS one woman suggested OKCupid and one suggested Zoosk.

Participants were asked *If you were looking for a casual sex/a hook-up with someone the same gender as you, which app are you most likely to use?* and offered the same list as above (table 5.15).

*Table 5.15: Four most popular apps when looking for casual sex/hook-up by area and gender, n (% of those who answered)*

Women MS (n=50)		Women CT (n=34)		Men MS (n=75)		Men CT (n=30)	
Tinder	32 (64)	Tinder	19 (55.9)	Grindr	63 (84)	Grindr	18 (64.3)
Unsure	8 (16)	HER	4 (11.8)	Other	5 (6.7)	Tinder	4 (14.3)
None of these	4 (8)	Unsure	4 (11.8)	Scruff	2 (2.7)	GROWLr	2 (7.1)
POF	2 (4)	None of these	3 (8.8)	None of these	2 (2.7)	Bender	1 (3.6)

In both areas most men indicated that Grindr was the app they would use for casual sex or a hook-up. In Merseyside two men suggested Fabguys, one Recon and one wrote “*not looking for sex at all*” and one wrote “*Craigslist is better for casual hook-ups in the Merseyside area*”. There was less consensus for women. Although women in both areas most commonly gave the response Tinder, lots of participants in both areas were unsure or would use none of these. Two extra suggestions were written: “*I don’t do casual sex*” and “*Meetme*”.

## 5.5 What factors influence frequency of app use?

Participants were asked three questions about frequency of apps use:

- *On average, how many times do you open or log on to these apps each day?*
- *On average, how many minutes do you spend on these apps each day?*
- *On average, how many messages do you send on these apps each day?*

Pearson correlations were used to measure relationship between the three measures. There were significant positive correlations between each measure, ranging from  $r=0.297$  to  $r=0.531$  (table 5.16).

*Table 5.16: Correlations between three measures of app use frequency*

		Times logging on app per day	Minutes on app per day	Messages sent per day on app
Times logging on app per day	Pearson Correlation	1	.422**	.297**
	n	195	194	192
Minutes on app per day	Pearson Correlation		1	.531**
	n		195	192
Messages sent per day on app	Pearson Correlation			1
	n			193

\*\*\* Correlation is significant at the 0.001 level (2-tailed). \*\* Correlation is significant at the 0.01 level (2-tailed). \* Correlation is significant at the 0.05 level (2-tailed).

### 5.5.1 Frequency of app use by demographic characteristics

Table 5.17 shows frequency of app use by demographic characteristics. Frequency of use was significantly higher for men on all three measures. Men logged on more than twice as many times a day (Mdn=5), spent twice as long on apps (Mdn=30mins) and sent five times as many messages (Mdn=5) than women (all  $p<0.001$ ). Times logging on (Mdn=5) and minutes on apps (Mdn=30mins) was also higher in MS ( $p<0.001$ ) – most likely because of the high proportion of men in MS.

Table 5.17: Frequency of app use by demographic characteristics, Mdn (IQR)

	<b>Times logging on a day</b> (n=195)	<b>Minutes on apps per day</b> (n=195)	<b>Messages sent per day</b> (n=193)
<b>Gender<sup>30</sup></b>	<b><math>p&lt;0.001</math></b>	<b><math>p&lt;0.001</math></b>	<b><math>p&lt;0.001</math></b>
Women	3 (1-5)	15 (5-30)	1 (0-5)
Men	5 (2-10)	30 (15-60)	5 (2-20)
<b>Area<sup>31</sup></b>	<b><math>p&lt;0.05</math></b>	<b><math>p&lt;0.05</math></b>	$p=0.218$
Merseyside	5 (2-10)	30 (10-57.5)	5 (1-10)
Connecticut	3 (1-5)	15 (5-35)	2 (1-10)
<b>Sexual Orientation<sup>32</sup></b>	<b><math>p&lt;0.001</math></b>	<b><math>p&lt;0.05</math></b>	$p=0.275$
Gay, lesbian or homosexual	5 (2-10)	30 (10-60)	4 (1-10)
Bisexual/other/no term	3 (1-5)	17.5 (8.5-30)	3 (1-10)
<b>Age<sup>33</sup></b>	$p=0.17$	$p=0.324$	<b><math>p&lt;0.005</math></b>
24 & younger	5 (2-10)	20 (10-60)	5 (2-17.5)
25+	4 (1-8)	20 (10-38.75)	2 (1-7.75)
<b>Member of a group discriminated against<sup>34</sup></b>	<b><math>p&lt;0.05</math></b>	<b><math>p&lt;0.05</math></b>	$p=0.79$
Discriminated	3 (1-8)	20 (10-35)	3 (1-10)
Not discriminated	5 (2-10)	30 (18.75-60)	5 (1-10.5)
<b>Area and gender</b>	<b><math>p&lt;0.001</math></b>	<b><math>p&lt;0.001</math></b>	<b><math>p&lt;0.001</math></b>
Women MS	3 (1-6)	20 (6.25-30)	2 (0-5)
Men MS	5 (2.25-15)	30 (20-60)	5 (2-12)
Women CT	2 (1-5)	12.5 (5-22.5)	1 (0-2.25)
Men CT	4 (2-9)	30 (12-90)	8 (2-25)
<b>Total</b>	<b>4 (1-10)</b>	<b>20 (10-45)</b>	<b>4 (1-10)</b>

Those who identified as gay, lesbian or homosexual used apps more frequently than those who used other terms on two measures; they logged on more often (Mdn=5,  $p<0.001$ ) and spent more minutes on apps per day (Mdn=30mins,  $p<0.05$ ). Age was only a significant factor in relation to messages sent, with participants aged 24 and younger sending more than twice as many messages per day (Mdn=5) than those who were 25 and older (Mdn=2,  $p<0.005$ ). Further analysis with Pearson Correlation showed there was a weak but significant negative correlation with messages; younger participants sent more messages ( $r=-0.171$ ,  $p<0.05$ ; data not shown).

<sup>30</sup> Gender: times logging on  $U=2575.5$ ,  $p<0.001$ ; minutes  $U=2486.5$ ,  $p<0.001$ ; messages sent  $U=2088$ ,  $p<0.001$

<sup>31</sup> Area: times logging on  $U=3401$ ,  $p<0.05$ ; minutes  $U=3556$ ,  $p<0.05$ ; messages sent  $U=3797$ ,  $p=0.218$

<sup>32</sup> Sexual orientation: times logging on  $U=2512$ ,  $p<0.001$ ; minutes  $U=3021.5$ ,  $p<0.05$ ; messages sent  $U=3251$ ,  $p=0.275$

<sup>33</sup> Age: Times logging on  $U=3805$ ,  $p=0.17$ ; minutes  $U=4005$ ,  $p=0.342$ ; messages sent  $U=3192.5$ ,  $p<0.005$

<sup>34</sup> Group discriminated: Times logging on  $U=3789.5$ ,  $p<0.05$ ; minutes  $U=3979.5$ ,  $p=0.91$ ; messages sent  $U=3868.5$ ,  $p=0.79$



Those who did not perceive themselves to be part of a group that is discriminated against in their country logged on significantly more often and spent significantly more time on apps per day. Further analysis confirmed age is not a confounding factor here as there was no significant difference in median age of those who feel they are discriminated against and those who feel they are not ( $U=4099.5$ ,  $Z=-1.435$ ,  $p>0.05$ ).

Men had higher median usage than women on all measures. Appendix E includes the tables showing frequency of app use by main gender and area groups, using post-hoc Mann-Whitney tests to examine individual differences. The key findings were that men in MS logged onto apps significantly more times a day and spent significantly longer on apps than women in CT and women in MS. In both areas men sent more messages than the women in that area; CT men sent a median 8 messages compared to CT women who send 1 message ( $p=0.001$ ). In MS men sent more than twice as many messages ( $Mdn=5$ ) than MS women ( $Mdn=2$ ,  $p=0.002$ ).

### 5.5.2 Frequency of app use by behavioural characteristics

Frequency of app use was also compared with app use and health behaviours to understand more about what factors linked with higher app use. Table 5.18 shows times logging into apps, minutes spent on app and messages sent per day, by behavioural characteristics.

*Table 5.18: Frequency of app use by behavioural characteristics, Mdn (IQR)*

	<b>Times logging on a day (n=195)</b>	<b>Minutes on apps per day (n=195)</b>	<b>Messages sent per day (n=193)</b>
<b>Total apps used<sup>M</sup></b>	<b><math>p&lt;0.001</math></b>	<b><math>p&lt;0.001</math></b>	<b><math>p&lt;0.005</math></b>
≤3 apps ever used	3 (1-5.25)	20 (5-30)	3 (0-6)
≥4 apps ever used	5 (2.5-10)	30 (15-60)	5 (1-15)
<b>Proportion of LGBTQ+ friends using apps<sup>K</sup></b>	<b><math>p&lt;0.005</math></b>	<b><math>p&lt;0.05</math></b>	<b><math>p&lt;0.005</math></b>
All/most	5 (2.25-10)	30 (15-60)	5 (2-18.75)
Many/come	3 (1-5)	20 (10-30)	3 (1-10)
A few/none/unsure	3 (1-7.75)	15 (5-37.5)	2 (0-5.75)
<b>Main reason for using apps. I want to<sup>K</sup></b>	<b><math>p=0.471</math></b>	<b><math>p&lt;0.05</math></b>	<b><math>p&lt;0.05</math></b>
... 'kill time' when bored	5 (1.25-10)	17.5 (5-30)	4 (0.75-5)
...make friends with other gay & bisexual people	4.5 (1.75-5)	30 (10-50)	3 (0-10)
...meet other gay & bisexual people to date	3 (1-8)	20 (10-30)	3 (0.5-10)
...find a boyfriend/girlfriend or other romantic partner	4 (2-10)	20 (10-30)	2 (1-10)
...meet other gay & bisexual people to have sex with	4 (2-11.5)	35 (18.75-100)	10 (2.75-25)
<b>Total</b>	<b>4 (1-10)</b>	<b>20 (10-45)</b>	<b>4 (1-10)</b>

As expected, those who used more apps ( $\geq 3$  apps ever used) had significantly higher frequency of app use on all three measures (table 5.21). Participants who reported all or most of their LGBTQ+ friends used apps reported logging on most often ( $X^2(2)=12.534$ ,  $p<0.005$ ), spent most minutes on apps ( $X^2(2)=7.925$ ,  $p<0.05$ ) and sent the most messages ( $X^2(2)=12.868$ ,  $p<0.005$ ). As this is an interval variable and we expect to see a trend in frequency of app use, a post-hoc Jonckheere test was performed (Ali and Abdur Rasheed, 2015). There

<sup>M</sup> Compared using Mann-Whitney test

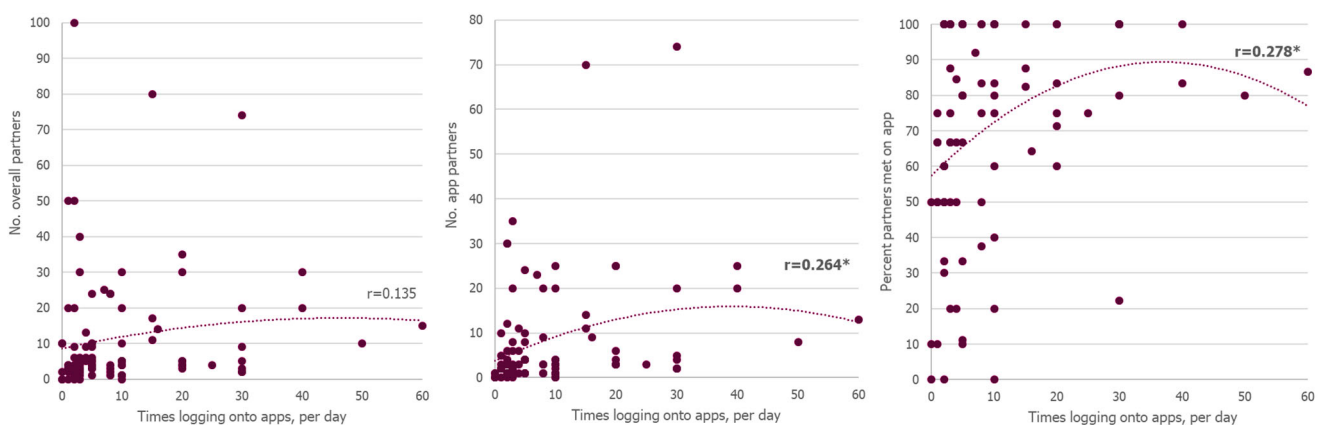
<sup>K</sup> Compared using Kruskal-Wallis test

was a significant positive relationship between proportion of LGBTQ+ friends using GSN apps and number of times logging on per day ( $J=5007.5$ ,  $z=-3.046$ ,  $p<0.005$ ), minutes spent on GSN apps per day ( $J=5129$ ,  $z=-2.775$ ,  $p<0.01$ ) and number of messages sent per day ( $J=4693.5$ ,  $z=-3.545$ ,  $p<0.001$ ). These three measures of app use show the more LGBTQ+ friends you have who use GSN apps the more frequently you will use them.

There were significant differences in the minutes a day spent on apps and number of messages sent between groups who use apps for different reasons. Participants who used apps to find sex spent the most minutes on apps ( $X^2(4)=10.84$ ,  $p<0.05$ ) and sent the most messages ( $X^2(4)=11.12$ ,  $p<0.05$ ).

To examine correlations between frequency of app use and number of sexual partners, Pearson's  $r$  was used, comparing for women and men separately. The three measures of frequency of app use were correlated with overall number of partners, number of app partners and percent of sexual partners met on apps.<sup>35</sup> None of the nine correlations were significant for women ( $p>0.05$ ; data not shown). The correlations between frequency of use and numbers of partners for men are shown in figures 5.4-5.6. One outlier was excluded from this section of analysis who stated he sent 300 messages per day; this was three times the number of messages sent by the next participant. Men who had higher app use per day also had more sexual partners; seven of the nine correlations showed significant positive relationships.

*Figure 5.4: Correlations between times logging on per day and sexual partners in previous 12 months, only men (with trendline)*

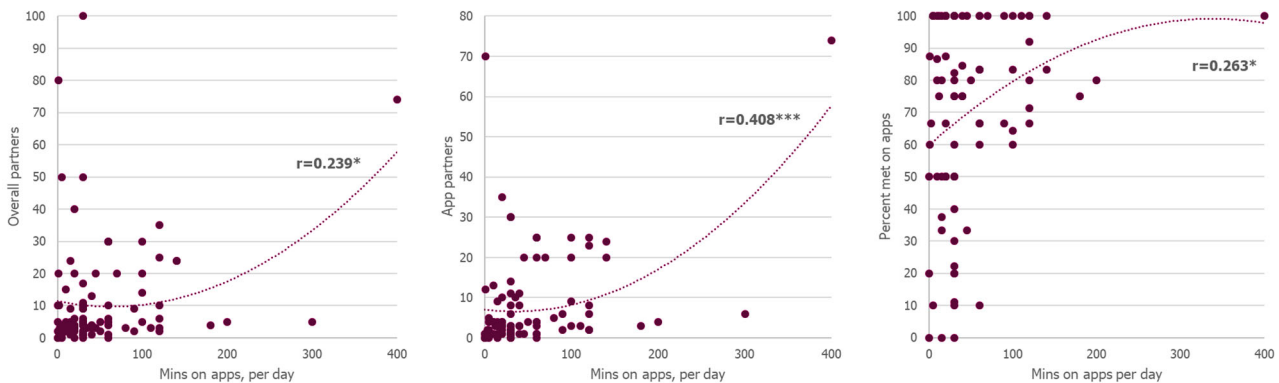


\*\*\*Difference is significant at the 0.001 level (2-tailed). \*\*Difference is significant at the 0.01 level (2-tailed). \*Difference is significant at the 0.05 level (2-tailed).

Figure 5.4 shows the relationship between numbers of times logging onto apps and numbers of sexual partners for men. Times logging onto apps showed a weak but significant positive correlation with number of app partners ( $r=0.264$ ,  $p<0.05$ ) and percent of partners met on apps ( $r=0.278$ ,  $p<0.01$ ).

<sup>35</sup> See section 5.7 for description of variables and further exploration of number of sexual partners

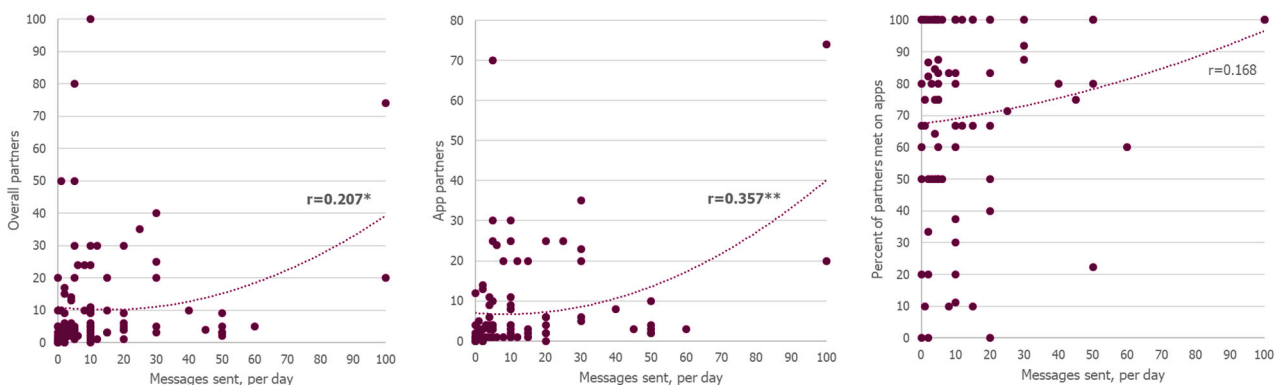
Figure 5.5: Correlations between minutes spent on apps per day and sexual partners in previous 12 months, only men (with trendline)



\*\*\*Difference is significant at the 0.001 level (2-tailed). \*\*Difference is significant at the 0.01 level (2-tailed). \*Difference is significant at the 0.05 level (2-tailed).

Number of minutes spent on apps per day showed weak but significant positive correlations with all measures of sexual partners (figure 5.5). Those who spent more minutes on apps had higher number of overall partners ( $r=0.239$ ;  $p<0.05$ ) higher numbers of app partners ( $r=0.408$ ;  $p<0.001$ ) and met a higher proportion of their partners on apps ( $r=0.263$ ;  $p<0.05$ ).

Figure 5.6: Correlations between times messages sent on apps per day and sexual partners in previous 12 months only men (with trendline)



\*\*\*Difference is significant at the 0.001 level (2-tailed). \*\*Difference is significant at the 0.01 level (2-tailed). \*Difference is significant at the 0.05 level (2-tailed).

Figure 5.6 shows the relationship between number of messages sent on apps and number of sexual partners. Messages sent per day shows a weak but significant correlation with number of overall partners ( $r=0.207$ ;  $p<0.05$ ) and number of apps partners ( $r=0.357$ ;  $p<0.001$ ).

## 5.6 What factors are associated with using apps to meet opposite-gender partners?

To investigate factors associated with using apps to meet partners of more than one gender, participants were asked: *Do you currently use smartphone dating apps to find sexual partners/relationships with people of the opposite sex?*

- *Yes*
- *No*
- *Prefer not to answer*

No, and prefer not to answer and any missing answers were recoded into "do not use to find opposite-gender partners". Table 5.19 presents univariate and multivariate analysis of those who also use apps to find opposite gender partners by participant characteristics. Univariate analysis suggests participants who used apps to find opposite-gender partners (as well as using them to find same-gender partners) were more likely to be from Connecticut, be women and, not surprisingly, identify using a term other than "Gay, lesbian or homosexual". There were significant differences in the proportion of each gender/area group who used apps to also find opposite-gender partners. Men in MS report the lowest use of apps to meet opposite-gender partners (5%) and women in CT report highest proportion use of apps to also meet opposite-gender partners (29%). Participants who also use apps to meet opposite-gender partners scored significantly lower on the Out to Family dimension of the Outness Inventory (meaning they were less "out";  $M=4.36$ ,  $SD=1.83$ ,  $U=1989$ ,  $p<0.005$ ) than to those who only used apps to meet same-gender partners.

Analysis of behavioural factors showed there were no differences in the proportion of participants who also use apps to meet opposite gender partners based on proportion of friend using apps, years on app, number of apps used or number of sexual partner in the previous 12 months ( $p>0.05$ , data not shown). Information about HIV and STI testing was not included due to the small number using apps to find opposite gender partners.

To understand the relationship between the variables multivariate analysis was performed using forward binary logistic regression (table 5.19; outcome variable 0=not using apps to find opposite-gender partners and 1=does use apps to find opposite gender partners). Variables entered into the model were those where univariate analysis showed  $p<0.1$  (Area, gender, sexual orientation and Out to Family). Area by gender was excluded as it is a composite of age and gender. Backward LR binary logistic regression confirmed the final equation.

The final equation only included one factor: sexual orientation. Participants who used as another term for their sexual orientation were 13 times more likely that those who identified as gay, lesbian or homosexual to also use apps to also meet opposite gender partners ( $AOR=12.93$ ,  $95\% CI=5.525-30.371$ ,  $p<0.001$ )

Table 5.19: Univariate and multivariate predictors of indicating yes they use apps to find opposite-gender partners

	Univariate analysis (indicating they also used apps to meet opposite-gender partners)				Multivariate analysis	
	n	%	Total	p-value <sup>x</sup>	AOR (95% CI)	p
<b>Total</b>	<b>36</b>	<b>17.4</b>	<b>207</b>			
<b>Area</b>				<b>&lt;0.01</b>	Ψ	
Merseyside	16	12	133			
Connecticut	20	27	74			
<b>Gender</b>				<b>&lt;0.01</b>	Ψ	
Woman	20	23.8	84			
Man	10	9.5	105			
Non-binary/genderqueer/ other/prefer not to say	6	33.3	18			
<b>Sexual orientation</b>				<b>&lt;0.001</b>		<b>&lt;0.001</b>
Gay, lesbian or homosexual	9	6	149		ref	
Bisexual/other/no term	27	46.6	58		12.95 (5.5-30.54)	<b>&lt;0.001</b>
<b>Level of education</b>				<i>0.795</i>	∞	
A levels/GED or lower	11	18	61			
Further education/some college	9	22.5	40			
Undergrad/bachelors	11	16.2	68			
Post grad	5	14.3	35			
<b>Proportion of friends that are LGBTQ</b>				<i>0.656</i>	∞	
More than half	14	20.3	69			
Half/less than half	16	17	94			
None/almost none/unsure	6	13.6	44			
<b>Gender by area</b>				<b>&lt;0.01</b>	∞	
Women MS	10	20	50			
Men MS	4	5.3	75			
Women CT	10	29.4	34			
Men CT	6	20	30			
<b>Age group</b>				<i>0.599</i>	∞	
24 & younger	19	19	100			
25+	16	16.2	99			
<b>Member of group discriminated against</b>				<i>0.075</i>	∞	
Discriminated	26	21.3	122			
Not discriminated	10	11.8	85			
<b>Out to Family</b>	Yes=4.36, No=5.36			<b>&lt;0.005</b>	Ψ	
<b>Out to World</b>	Yes=4.96, No=5.34			<i>0.198</i>	∞	

Ψ Excluded from final equation ∞ Not included in log regression model

<sup>x</sup> Compared using Pearson's chi-square

## 5.7 What factors are associated with number of sexual partners?

To understand how demographic and behavioural factors might be linked with increased number of sexual partners, all participants were asked two questions about number of sexual partners.

- *In the last 12 months, approximately how many people of your own gender have you had sex with? (Answer in whole numbers or leave blank, if you aren't sure please estimate)*
- *In the last 12 months, approximately how many of these people did you meet on a smartphone dating app? (Answer in whole numbers or leave blank, if you aren't sure please estimate)*

There was a strong, significant positive correlation between these two figures, for both women ( $r=0.897$ ,  $p<0.001$ ) and men ( $r=0.861$ ,  $p<0.001$ ). From these two answers a third variable was calculated: percent of partners met on an app. Six respondents had a figure over 100%, which must have been an error in one of the answers; these were recoded to system missing and excluded from analysis. Due to the abnormal distribution of data, medians were used and Mann-Whitney or Kruskal-Wallis was used to compare differences between groups.

### 5.7.1 Number of sexual partners by demographic factors

Table 5.20 shows median sexual partners by demographic characteristics. Men had significantly higher numbers of sexual partners than women: men had five times as many overall partners ( $U=1502$ ,  $z=-7.392$ ,  $p<0.001$ ) and three times as many app partners than women ( $U=1518.5$ ,  $z=-6.898$ ,  $p<0.001$ ). However, women and men met similar proportion of their sexual partners on apps ( $p=0.952$ ). Participants in MS reported a median higher number of overall sexual partners ( $U=3597.5$ ,  $z=-2.530$ ,  $p<0.05$ ) and twice as many app partners ( $U=3275.5$ ,  $z=-2.599$ ,  $p<0.01$ ) than participants in CT. This is most likely because there was a higher proportion of male respondents in MS. There was no difference between areas in the percent of partners who were met on apps ( $p>0.05$ ).

Participants who identified as gay, lesbian or homosexual had twice as many overall sexual partners ( $U=2886.5$ ,  $z=-3.347$ ,  $p<0.001$ ) and twice as many app partners ( $U=2720.5$ ,  $z=-3.061$ ,  $p<0.01$ ) than participants who were bisexual, other or used no term. Again, there was no difference in the percent of partners who were met on apps.

For the different levels of education there was a significant difference in number of overall sexual partners ( $X^2=8.486$ ,  $df=3$ ,  $p<0.05$ ) and app partners ( $X^2=8.286$ ,  $df=3$ ,  $p<0.05$ ), with those having an undergraduate or bachelors qualification reporting the highest number of overall and app partners. Due to the expected linear relationship between education and number of partners, Jonckheere tests were conducted and showed the relationship was not significant for number of overall partners ( $J=7923.5$ ,  $z=1.894$ ,  $p>0.05$ ) or number of app partners ( $J=7220.5$ ,  $z=1.649$ ,  $p>0.05$ ).

*Table 5.20: Number and proportion of sexual partners met on apps in previous 12 months by demographic characteristics, Mdn (IRQ)*

	<b>No. overall partners (n=200)</b>	<b>No. app partners (n=192)</b>	<b>Percent of sexual partners met on apps (n=157)</b>
<b>Gender</b>	<b><i>p</i>&lt;0.001</b>	<b><i>p</i>&lt;0.001</b>	<i>p</i> =0.952
Woman	1 (0-2)	1 (0-1.5)	80 (28.6-100)
Man	5 (2-10.5)	3 (1-9.25)	75 (50-100)
<b>Area</b>	<b><i>p</i>&lt;0.05</b>	<b><i>p</i>&lt;0.01</b>	0.915
Merseyside	3 (1-8)	2 (1-5.75)	75 (50-100)
Connecticut	2 (1-3)	1 (0-3)	86.67 (12.5-100)
<b>Age Group</b>	<i>p</i> =0.794	<i>p</i> =0.534	<i>p</i> =0.355
24 and younger	3 (1-5)	1 (1-3.5)	69 (33.3-100)
25+	2 (1-6)	2 (1-4.5)	80 (50-100)
<b>Sexual Orientation</b>	<b><i>p</i>&lt;0.001</b>	<b><i>p</i>&lt;0.01</b>	0.376
Gay, lesbian or homosexual	3 (1-7.25)	2 (1-5)	80 (50-100)
Bisexual/other/no term	1.5 (0-3)	1 (0-2)	66.67 (12.5-100)
<b>Education level</b>	<b><i>p</i>&lt;0.05</b>	<b><i>p</i>&lt;0.05</b>	<i>p</i> =0.93
A levels/GED or lower	2 (0-5)	1 (0-3)	75 (50-100)
Further education/some college	2 (1-4)	1 (0-3)	81.67 (47.5-100)
Undergrad/bachelors	4 (1-10)	2 (1-8)	75 (40-100)
Post grad	2 (1-6.5)	1 (0-5.25)	80 (50-100)
<b>Area/Gender</b>	<b><i>p</i>&lt;0.001</b>	<b><i>p</i>&lt;0.001</b>	<i>p</i> =0.972
Women MS	1 (0-2.75)	1 (0-1.5)	77.5 (47.5-100)
Men MS	5 (3-14.5)	4 (1-11)	75 (50-100)
Women CT	1 (0-2)	1 (0-1.75)	91.67 (0-100)
Men CT	3 (1.25-5.75)	2 (1-4)	80 (45-100)
<b>Member of a group discriminated against</b>	<i>p</i> =0.721	<i>p</i> =0.333	<b><i>p</i>&lt;0.05</b>
Discriminated	2 (1-5)	1 (0-3.75)	66.67 (35-100)
Not discriminated	3 (1-5.75)	2 (1-4)	82.35 (55-100)
<b>Proportion of friends LGBTQ</b>	<i>p</i> =0.712	<i>p</i> =0.762	<i>p</i> =0.380
More than half	2 (1-6)	2 (0-4)	75 (35.42-100)
Approx. half/less than half	2 (1-5)	1 (1-3)	80 (50-100)
None/almost none/unsure	3 (1-10)	2 (0-8)	80 (52.5-100)
<b>Total</b>	<b>2.5 (1-5)</b>	<b>1.5 (1-4)</b>	<b>80 (50-100)</b>

Of all the comparisons only one factor showed a significant association with percent of partners met on apps – those who felt they were discriminated against in their country had met a lower percentage of their sexual partners on apps than those who felt they did not face discrimination ( $U=2302.5$ ,  $z=-2.313$ ,  $p<0.05$ ).

When comparing the main gender and area groups there are significant differences in numbers of overall partners ( $p<0.001$ ) and number of app partners ( $p<0.001$ ); on both measures men in Merseyside reported the highest number of sexual partners. To examine these differences in more detail, six post hoc Mann-Whitney tests were run to compare differences between groups on the two measures of sexual partners<sup>36</sup>. For both

<sup>36</sup> To reduce the chance of a Type 1 error, the Bonferroni correction was used, the critical value was  $p=0.0083$  (0.05 divided by the number of Mann-Whitney tests, 6)



measures (number of overall partners and number of app partners) the differences split on gender lines. Both groups of men had significantly more overall partners and app partners than both groups of women<sup>37</sup>. There were no significant differences in the number of partners between groups of the same gender<sup>38</sup>.

### 5.7.2 Number of sexual partners by health and behavioural characteristics

Table 5.21 shows the median numbers and proportions of sexual partners by behavioural and health characteristics.

*Table 5.21: Number and proportion of sexual partners met on apps in previous 12 months by behavioural and health characteristics, Mdn (IRQ)*

	<b>No. overall partners (n=200)</b>	<b>No. app partners (n=192)</b>	<b>Percent of sexual partners met on apps (n=157)</b>
<b>Use apps to find opposite gender partners</b>	<i>p=0.337</i>	<i>p=0.145</i>	<i>p=0.88</i>
Yes	2 (1-5)	1 (0-3)	87.08 (35-100)
No	3 (1-5.25)	2 (1-4)	77.5 (50-100)
<b>Number of apps used</b>	<i>p&lt;0.001</i>	<i>p&lt;0.001</i>	<i>p=0.096</i>
≤ 3 apps ever used	1 (0.75-3)	1 (0-2)	66.67 (20-100)
≥ 4 apps ever used	4.5 (2-10)	3 (1-9)	81.18 (60-100)
<b>Years on apps</b>	<i>p&lt;0.001</i>	<i>p=0.19</i>	<i>P=0.382</i>
3 years or fewer	2 (1-4)	1 (0-3)	71.43 (33.3-100)
4 years +	3 (1-9)	2 (1-5.5)	80 (50-100)
<b>Main reason you use apps: I want to:</b>	<i>p&lt;0.001</i>	<i>p&lt;0.001</i>	<i>p=0.51</i>
...'kill time' when bored	3 (1-5)	2 (0-4)	75 (22.2-87.5)
...make friends with other gay & bisexual people	2 (1-4)	1.5 (0-3.25)	50 (0-95)
...meet other gay & bisexual people to date	2 (0-5)	1 (0-3)	80 (37.5-100)
...find a boyfriend/girlfriend or other romantic partner	1 (1-3.75)	1 (0-2)	100 (50-100)
...meet other gay & bisexual people to have sex with	6 (3-20)	5 (2-20)	69.05 (60-90.5)
<b>Proportion LGBTQ+ friends using apps</b>	<i>p&lt;0.001</i>	<i>p&lt;0.001</i>	<i>p=0.959</i>
All/most	4 (2-10)	3 (1-7.5)	75 (50-100)
Many/some	2 (1-6)	1 (1-4)	80 (45-100)
A few/none/unsure	1 (0-3)	1 (0-2)	83.33 (33.3-100)
<b>Last HIV test</b>	<i>p&lt;0.001</i>	<i>p&lt;0.001</i>	<i>p=0.642</i>
Last 12 months	4 (1-10)	3 (1-8)	77.5 (50-100)
Over 12 months	1 (0-3)	1 (0-2)	77.5 (37.5-100)
Never/unsure/prefer not to say	1 (0-3)	1 (0-2)	83.75 (38.3-100)
<b>Last STI test</b>	<i>p&lt;0.001</i>	<i>p&lt;0.001</i>	<i>p=0.636</i>
Last 12 months	4 (2-10)	2 (1-8)	80 (50-100)
Over 12 months	1 (1-3)	1 (0-3)	75 (33.3-100)
Never/unsure/prefer not to say	1 (0-3)	1 (0-2)	100 (36.7-100)
<b>Total</b>	<b>2.5 (1-5)</b>	<b>1.5 (1-4)</b>	<b>80 (50-100)</b>

As may be expected, there was a significant relationship between how often people use apps and number of sexual partners in the previous 12 months. Those who have ever used three or more apps reported over four times as many overall partners ( $U=2450$ ,  $z=-6.256$ ,  $p<0.001$ ) and three times as many app partners ( $U=2333$ ,  $z=-5.988$ ,  $p<0.001$ ) than those who use fewer apps. Participants who have used apps for 4 years or more

<sup>37</sup> For overall partners and app partners: MS men vs MS women  $p<0.0083$ , MS men vs CT women  $p<0.0083$ , CT men vs CT women  $p<0.0083$  and CT men vs MS women  $p<0.0083$ .

<sup>38</sup> For overall partners and app partners: CT women vs MS women  $p>0.0083$  and CT men vs MS men  $p<0.0083$

report higher number of overall partners ( $U=3626$ ,  $z=-5.2734$ ,  $p<0.01$ ), however there were no significant differences in number of app partners by years on apps ( $U=3450.5$ ,  $z=-2.342$ ,  $p>0.01$ ). However, we must be careful not to assume a causal relationship – it may be that those who want more sex have heavier app use, or that those who have heavier app use end up having more sex.

There were significant differences in the number of sexual partners (both overall partners and app partners) depending on the main reason someone uses apps. Those whose main reason for using apps is to meet other gay & bisexual people to have sex with reported the highest number of overall partners ( $Mdn=6$ ) and highest number of app partners ( $Mdn=5$ ). To examine these differences in more detail, post-hoc Mann-Whitney tests were run to compare differences between groups on the two measures of sexual partners<sup>39</sup>. For both measures of sexual partners, those whose main reason for using apps was to find sex were compared against the other four groups. Those who reported their main reason for using apps was to meet other gay & bisexual people to have sex with had a significantly higher number of overall partners than people who used apps for any of the other four reasons (all  $p<0.0125$ ). Those who used apps to find people to have sex with also reported significantly more app partners than those who used apps to find friends ( $p<0.005$ ), to meet people to date ( $p<0.001$ ) and to find romantic partners ( $p<0.001$ ). However, those who used apps to find sex had a similar number of app partners as those who used apps to kill time ( $p>0.0125$ ).

Participants who reported that all or most of their LGBTQ+ friends also use apps had the highest number of overall partners ( $Mdn=4$ ) and app partners ( $Mdn=3$ ). The Kruskal-Wallis test showed what appears to be a linear relationship between proportion of friends who use apps and number of sexual partners; therefore a Jonckheere test was used to further examine this (Field, 2009). There was a significant linear relationship with those reporting more LGBTQ+ friends using apps having higher numbers of overall partners ( $J=4311$ ,  $z=-5.286$ ,  $p<0.001$ ) and higher numbers of app partners ( $J=4046.5$ ,  $z=-5.031$ ,  $p<0.001$ ).

There are significant differences in number of sexual partners and when someone last had an HIV and STI test. Participants who had an HIV test in last 12 months reported the highest number of overall partners ( $Mdn=4$ ,  $p<0.001$ ) and highest number of app partners ( $Mdn=3$ ,  $p<0.001$ ). This linear relationship was confirmed by Jonckheere tests (number of overall partners,  $J=3641$ ,  $z=-5.088$ ,  $p<0.001$  and number of app partners,  $J=3520$ ,  $z=-4.530$ ,  $p<0.001$ ).

Those who had an STI test in last 12 months reported the highest number of overall partners ( $Mdn=4$ ,  $IQR=2-10$ ,  $p<0.001$ ) and highest number of app partners ( $Mdn=2$ ,  $IQR=1-8$ ),  $p<0.001$ ). This linear relationship was also confirmed using a Jonckheere test (overall number of sexual partners,  $J=3641$ ,  $z=-3.378$ ,  $z=-6.033$ ,  $p<0.001$  and number of app partners,  $J=3342$ ,  $z=-5.135$ ,  $p<0.001$ ). The overall median proportion of sexual partners met on apps was 80% and this did not differ significantly between any of the health or behavioural characteristic groups.

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<sup>39</sup> To reduce the chance of a Type 1 error, the Bonferroni correction was used, the critical value was  $p=0.0125$  (0.05 divided by the number of Mann-Whitney tests, 4).

## 5.8. Are apps changing behaviour?

The survey aimed to understand if apps have changed behaviour and the types of partners. A question asked participants which of a list of options related to partners they met on apps. Respondents could tick all that apply. *Are the sexual partners you meet on the apps any different from partners you met before using apps? (tick all that apply)*

1. App partners are no different
2. App partners are "more like me"
3. I have more partners now I use apps
4. App partners are closer to my age
5. App partners live closer to me
6. App partners are more "my type"
7. App partners are easier to meet
8. I didn't meet same gender partners before using apps
9. Prefer not to say

Overall 19% of all participants stated "I didn't meet same gender partners before using apps". This statement could be ambiguous; it may be that participants who agreed with this are younger and they were not dating before the invention of apps, or if they are older and were dating before apps, maybe they were only seeking opposite-gender partners. Those who stated they did not meet same-gender partners before they used apps were of a similar age ( $M=25.4$ ,  $SD=8.74$ ) to those who did not agree with this statement ( $M=28.1$ ,  $SD=9.82$ ,  $U=1464$ ,  $z=-1.033$ ,  $p>0.05$ ). The groups being of similar ages suggests that apps may have coincided with this change and they started seeking same gender partners at the same time as starting to use apps; however, we cannot infer cause and effect.

### 5.8.1 Differences in app partners by demographic characteristics

Due to the relatively small numbers ticking each box, chi-square analysis was conducted on only the main demographic groups – gender, area and sexual orientation. Table 5.22 shows how app partners differ from previous partners for men and women.

Table 5.22: Differences in app partners by gender,  $n$  (% agreeing with each statement)

	Women	Men	Total agreeing (men & women)	$\chi^2$	p-value	Total agreeing (all genders)
<b>App partners are easier to meet</b>	24 (28.6)	40 (38.1)	64	1.890	0.169	71 (34.3)
<b>App partners are no different</b>	23 (27.4)	36 (34.3)	59	1.036	0.309	63 (30.4)
<b>I have more partners now I use apps</b>	16 (19)	27 (25.7)	43	1.180	0.277	50 (24.2)
<b>App partners more "my type"</b>	15 (17.9)	20 (19)	35	0.044	0.834	37 (17.9)
<b>I didn't meet same gender partners before using apps</b>	18 (21.4)	17 (16.2)	35	0.849	0.357	39 (18.8)
<b>App partners live closer to me</b>	8 (9.5)	22 (21)	30	4.565	<0.05	33 (15.9)
<b>App partners are "more like me"</b>	14 (16.7)	6 (5.7)	20	5.916	<0.05	21 (10.1)
<b>App partners are closer to my age</b>	4 (4.8)	14 (13.3)	18	3.979	<0.05	20 (9.7)
<b>Total</b>	<b>84</b>	<b>105</b>	<b>189</b>			<b>207</b>

The statement with which the highest proportion of participants agreeing was “app partners are easier to meet” (women 29%, men 38%;  $p=0.169$ ). The second most common response for both groups was “App partners are no different” (women 27%, men 34%); again, this was a similar proportion of both genders ( $p=0.309$ ). Three of the statements differed by gender, however; these were the least popular responses. A larger proportion of women (17%) than men (6%) felt their app partner were “more like me” ( $p<0.05$ ), a significantly higher proportion of men (21%) thought their app partners lived closer, compared to women (10%;  $p<0.05$ ) and more men (13%) felt their app partners were closer to their age than women (5%;  $p<0.05$ ).

None of the statements showed significant differences between MS and CT ( $p>0.05$ , data not shown) or between those who identified gay, lesbian or homosexual and those who identified as bisexual/other/no term ( $p>0.05$ , data not shown).

### 5.8.2 Differences in app partners by behavioural characteristics

Table 5.23 shows how app partners differ from previous partners, by the proportion of their LGBTQ+ friends who use apps.  $X^2$  linear trend analysis was used for this ordinal variable. Participants who had more LGBTQ+ friends who use apps were more likely to report their app partners are easier to meet ( $p<0.001$ ) and that they had more app partners now they use apps ( $p<0.005$ ). As there was no linear trend for the variable “I didn’t have same-gender partner before apps” adjusted standardised residuals were examined. This revealed that for those who had few/none/unsure proportion of LGBTQ+ friends using apps, a higher proportion than expected did not have same-gender partners before they used apps.

*Table 5.23: Differences in app partners by proportion of LGBTQ+ friends who use GSN apps n (% agreeing with each statement; all genders)*

	All/ most	Many/ some	A few/ none/ unsure	Total	Pearson Chi Sq		Post hoc
					$X^2$	p-value	p-value
<b>App partners are easier to meet</b>	35 (45.5)	27 (38)	9 (15.3)	71	14.187	<b>&lt;0.001</b>	<b>&lt;0.001<sup>L</sup></b>
<b>App partners are no different</b>	26 (33.8)	20 (28.2)	17 (28.8)	63	0.649	0.723	
<b>I have more partners now I use apps</b>	26 (33.8)	17 (23.9)	7 (11.9)	50	8.749	<b>&lt;0.05</b>	<b>&lt;0.005<sup>L</sup></b>
<b>I didn’t meet same-gender partners before apps</b>	12 (15.6)	9 (12.7)	18 (30.5)	39	7.551	<b>&lt;0.05</b>	<b>&lt;0.008<sup>L</sup></b>
<b>App partners more “my type”</b>	16 (20.8)	16 (22.5)	5 (8.5)	37	5.045	0.080	
<b>App partners live closer to me</b>	15 (19.5)	12 (16.9)	6 (10.2)	33	2.235	0.327	
<b>App partners are “more like me”</b>	7 (9.1)	10 (14.1)	4 (6.8)	21	2.036	0.361	
<b>App partners are closer to my age</b>	7 (9.1)	10 (14.1)	3 (5.1)	20	3.036	0.219	
<b>Total</b>	<b>77</b>	<b>71</b>	<b>59</b>	<b>207</b>			

<sup>L</sup> Linear trend analysis; App partners are easier to meet,  $X^2=12.912$ ,  $p<0.001$ . I have more partners now I use apps  $X^2=8.675$ ,  $p<0.005$

<sup>z</sup> Standardised residuals; for participants who have few/none/unsure proportion of LGBTQ+ friends using dating apps, didn’t meet same gender partners before using apps yes vs no,  $z=2.7$ ,  $p=0.007$ . To reduce the chance of a Type 1 error the Bonferroni correction was used, the critical value was  $p=0.0083$  (0.05 divided by the number of tests, 6)

Table 5.24: Differences in app partners by main reason for using apps, n (% agreeing with each statement; all genders)

	<b>I want to:</b>							
	...‘kill time’ when bored	...make friends with other gay and bisexual people	...meet other gay and bisexual people to date	...find a boyfriend / girlfriend or other romantic partner	...meet other gay and bisexual people to have sex with	<b>Total</b>	<b>X<sup>2</sup></b>	<b>p-value</b>
<b>App partners are easier to meet</b>	16 (53.3)	9 (45)	13 (33.3)	16 (22.9)	17 (37.8)	71	10.071	<b>&lt;0.05</b>
<b>App partners are no different</b>	12 (40)	7 (35)	10 (25.6)	19 (27.1)	15 (33.3)	63	2.414	0.66
<b>I have more partners now I use apps</b>	4 (13.3)	5 (25)	8 (20.5)	11 (15.7)	22 (48.9)	50	19.746	<b>&lt;0.001</b>
<b>I didn’t meet same gender partners before using apps</b>	5 (16.7)	2 (10)	9 (23.1)	20 (28.6)	3 (6.7)	39	10.145	<b>&lt;0.01</b>
<b>App partners more "my type"</b>	5 (16.7)	8 (40)	4 (10.3)	12 (17.1)	7 (15.6)	36	8.510	0.075
<b>App partners live closer to me</b>	3 (10)	7 (35)	4 (10.3)	6 (8.6)	13 (28.9)	33	14.074	<b>&lt;0.05<sup>α</sup></b>
<b>App partners are "more like me"</b>	1 (3.3)	2 (10)	5 (12.8)	10 (14.3)	3 (6.7)	21	3.492	0.471 <sup>α</sup>
<b>App partners are closer to my age</b>	2 (6.7)	3 (15)	5 (12.8)	5 (7.1)	5 (11.1)	20	2.277	0.701 <sup>α</sup>
<b>Total</b>	<b>30</b>	<b>20</b>	<b>39</b>	<b>70</b>	<b>45</b>	<b>204</b>		

Table 5.24 shows how app partners differ from previous partners by main reason for using apps. There were significant differences in how many people agreed with the statement “app partners are easier to meet” depending on the main reason they used apps ( $p < 0.05$ ); the smallest proportion agreeing that app partners were easier to meet were those using apps to find a boyfriend/girlfriend or a romantic partner (23%). The group with the highest proportion agreeing that app partners are easier to meet were those who used apps to kill time when bored (53%). Participants also reported significant differences between main reason groups on “I have more partners now I use apps” ( $p < 0.001$ ) and “App partners live closer to me” ( $p < 0.005$ ); for both of these statements the highest proportion agreeing said they used apps to meet other gay and bisexual people to have sex. Those who did not meet same-gender partners before using apps were more likely to be using apps to find a boyfriend/girlfriend or other romantic partner or be looking for other gay and bisexual people to date ( $p < 0.05$ ). Adjusted standardised residuals showed participants whose main reason for using apps is to meet other gay and bisexual people for sex were significantly more likely to say they had more partners now they use apps<sup>40</sup>

<sup>α</sup> Using Fisher’s Exact as  $\geq 20\%$  cells had expected count less than 5

<sup>40</sup> Participants whose main reason for using apps is for sex – “more partners now I use apps” 1 vs 0 ( $z = 4.3$ ,  $p < 0.005$ ). To reduce the chance of a Type 1 error the Bonferroni correction was used, the critical value was  $p = 0.005$  (0.05 divided by the number of tests, 10)

### 5.8.3 Demographic and behavioural factors associated with having more sexual partners now they use apps

This research is particularly interested in changes to sexual behaviour because of apps. Fifty participants (24%) agreed with the statement “I have more [sexual] partners now I use apps”. Univariate analysis using chi-square analysis (categorical variables) and Mann-Whitney (continuous variables) examined relationships between demographic and behavioural characteristics and agreement with the statement (table 5.25).

Proportion of friends who use apps and main reason for using apps were associated univariately with agreement with statement “I have more partners now I used apps” ( $p < 0.05$ ). Participants who agreed they have more sexual partners now they use apps had a higher median number of overall sexual partners ( $Mdn=5$ ;  $U=2162$ ,  $z=-4.408$ ,  $p < 0.001$ ) than those who did not think they had more sexual partners now they used apps. There were no differences in the proportion of participants who indicated they have more sexual partners now they use apps, when comparing participants by gender, area, sexual orientation, proportion of their friends who were LGBTQ+, years on apps or the percent of all their sexual partners who they met on apps.

Multivariate forward LR binary logistic regression was conducted to predict the odds of agreeing with the statement “I have more partners now I use apps” (0 = did not agree, 1 = agreed). All variables showing univariate significance of  $p < 0.1$  were included in the model, this included; proportion of LGBTQ+ friends using GSN apps (none/almost none/unsure as ref), one of the reasons they use apps is to meet other gay and bisexual people to date (agreeing with statement as ref), one of the reasons they used apps is to meet other gay & bisexual people to have sex (agreeing with statement as ref) and number of apps ever used ( $\leq 3$  apps ever used as ref). The scale variable number of overall partners was also entered in the model. The model’s final equation included two variables; proportion of LGBTQ+ friends using apps and sex is one reason you use apps. The model was confirmed using the backward LR method and the same two variables were included in that final model.

The proportion of LGBTQ+ friends using GSN apps showed a significant relationship with having more sexual partners now they use apps ( $p < 0.05$ ); participants who reported all or most of their LGBTQ+ friends used GSN apps were over three times more likely to say they had more sexual partners now they used GSN apps ( $AOR=3.4$ , 95% CI 1.3-8.7;  $p < 0.05$ ). Participants who indicated one of the reasons they used GSN apps was to find people to have sex with were three times more likely to say they had more sexual partners than those who did not use apps to find people to have sex with ( $AOR= 3.1$ , 95% CI 1.3-7.2  $p < 0.01$ ).

Table 5.25: Univariate and multivariate predictors of agreeing with statement "I have more [sexual] partners now I use apps"

	Univariate analysis (indicating yes)				Multivariate analysis	
	n	%	Total	p	AOR (95% CI)	p
<b>Total</b>	<b>50</b>	<b>24%</b>	<b>207</b>			
<b>Gender</b>				<i>0.277</i>	∞	
Women	16	19%	84			
Men	27	26%	105			
<b>Area</b>				<i>0.703</i>	∞	
Merseyside	31	23%	133			
Connecticut	19	26%	74			
<b>Sexual orientation</b>				<i>0.149</i>	∞	
Gay, lesbian or homosexual	32	22%	149			
Bisexual/other/no term	18	31%	58			
<b>Also use apps to find opposite-gender partners</b>				<i>0.131</i>	∞	
Use to find opposite-gender partners	12	33%	36			
Do not use to find opposite-gender partners	36	22%	167			
<b>Proportion of friends who are LGBTQ+</b>				<i>0.723</i>	∞	
More than half	19	28%	69			
Half/less than half	21	22%	94			
None/almost none/unsure	10	23%	44			
<b>Proportion LGBTQ+ friends using apps</b>				<b>0.013</b>		<b>0.04</b>
All/most	26	34%	77		3.4 (1.3-8.7)	<b>0.011</b>
Many/some	17	24%	71		2.4 (0.9-6.2)	0.89
A few/none/unsure	7	12%	59		ref	
<b>All reasons you use apps:</b>						
<b>...‘kill time’ when bored</b>				<i>0.227</i>	∞	
Indicating yes	35	27%	130			
Indicating no	15	19%	77			
<b>...make friends with other gay &amp; bisexual people</b>				<i>0.949</i>	∞	
Indicating yes	30	24%	125			
Indicating no	20	24%	82			
<b>...meet other gay and bisexual people to date</b>				<b>0.028</b>	Ψ	
Indicating yes	41	28%	144			
Indicating no	9	14%	63			
<b>...find boyfriend/girlfriend or other romantic partner</b>				<i>0.925</i>	∞	
Indicating yes	35	24%	146			
Indicating no	15	25%	61			
<b>...meet other gay &amp; bisexual people to have sex with</b>				<b>0.001</b>		
Indicating yes	42	31%	134		3.1 (1.3-7.2)	<b>0.008</b>
Indicating no	8	11%	73		ref	
<b>Years on apps</b>				<i>0.307</i>	∞	
≤ 3 years	26	28%	93			
≥ 4 years	23	22%	106			
<b>No. apps ever used</b>				<b>0.057</b>	Ψ	
≤ 3 apps ever used	20	19%	107			
≥ 4 apps ever used	30	30%	100			
<b>No. overall partners (median)</b>		yes=5, no=2		<b>&lt;0.001</b>	Ψ	
<b>Percent partners met on app (median)</b>		yes=81.7%, no=75%		<i>0.656</i>	∞	

∞ Not included in log regression model Ψ Entered into model but excluded from final equation



### 5.8.4 Other ways of meeting partners

Participants were asked an open-ended question “*If these kinds of apps had not been invented, what other ways would you use to find sexual partners or relationships with people of the same gender?*” - this question was answered by 160 participants. The most common answer provided by three out of five respondents was that they would go to pubs, bars and clubs; a similar proportion of men and women stated this option. Some people specified gay or LGBTQ+ venues but most referred to just bars or clubs in general. Some people also stated in this box that although they would go to bars and clubs they did not like such places.

*Gay clubs or something. (bi/pansexual woman, CT)*

*Go out I suppose, but for me, the gay scene is so bad in Liverpool that there isn't the correct places to meet anyone (gay woman, MS)*

The second most often stated way to meet partners was through their existing social connections such as friends, family, work or college. This was equally common in men and women with about a quarter of people stating this. Other online platforms were suggested by about one in ten people; this included specific social media such as Facebook, Instagram and Twitter as well as references to online dating sites, chatrooms and forums and specific online communities such as Fitlads. One in seven men suggested they would use sex focused venues or activities if apps were not available; including cruising, saunas, swingers and sex parties, kink or fetish events, public toilets and darkrooms. This type of venue was only suggested by one woman. Eleven participants stated they would not know how to meet same gender partners and seven said without apps they would not know how to meet same-gender partners without apps.

## 5.9 Participant views of the positives, risks and negative experiences of using GSN apps

At the end of the survey, participants were asked three open ended questions about their experiences and opinions of using apps. The themes from the text is presented below. Responses were examined by gender (men and women). Responses were also compared by area, but conclusions cannot be drawn due to the small numbers.

The first questions asked “*What do you think are the benefits of using these types of apps and of meeting people through these apps?*”

The open text boxes received responses from 173 individuals with many people stating more than one benefit. A similar proportion of women (81%) and men (85%) answered the question. Overall, the most common responses (from 63 participants) were quite generic saying they thought apps were easy, convenient or a fast way to meet partners. This response was more common in men, two in five men (who responded) and one in three women (who responded) mentioned ease, convenience or speed of meeting people.

*They are quick and based on location so therefore the encounter can happen quicker rather than later (gay man, MS)*

*Apps are more instant (gay man, CT)*

*a lot easier to meet people without having to go to a lot of effort (gay woman, MS)*

The second most common reason, indicated by 26 people, was that GSN apps allow users to access a higher number of potential partners. Apps extend their potential pool and enabled them to meet people outside of their social circle. This was particularly important for women; of those who responded to the questions a quarter of women cited this reason compared to less than one in ten men.

*Wider field of lesbians (gay woman, MS)*

*You see more people and more people see you. You can cast a wider net. (gay man, CT)*

Sixteen people stated they thought apps helped with shyness and made things easier for those who were introverted.

*Talking to people in real life is scary (gay woman, MS)*

*I'm also too shy to start a conversation in person (gay man, CT)*

Sixteen participants stated that apps allowed them to get to know potential partners or dates before meeting them in person. Three times as many women than men stated this was a benefit.

*You can get a rough idea on whether or not you'll get along with someone while chilling on your couch, instead of finding out while sitting through a terrible coffee date. It might still be awful, but you can weed out some red flags (bi/pansexual woman, CT)*

*Talk before meeting, see if you have common interests before meeting up (gay man, MS)*

Fifteen people felt apps allowed them more control over who they talked to or met up with. Apps allowed them to be more selective and find specific types of people to date. This was much more common in women.

*other peoples' profiles allow me to screen potential dates for compatibility/attraction (gay woman, CT)*

*less hassle easy to identify tops and bottoms, can search specific types and geographical areas (gay man, MS)*

Other less common themes (in order of occurrence) included; apps allow you to find nearby partners or partners in a specific location; apps allow people to be more open or specific about what they want; you know people on apps are definitely interested in same-sex partners; apps provide opportunity for discretion or anonymity; apps provide an alternative to meeting in bars or clubs; and apps have led to friendships.

A second open question, "Is there anything you worry about when using the apps and meeting people through these apps?" was answered by 173 participants (81% of women and 85% of men). The most commonly reported worry was that people on apps were not being honest, were misrepresenting themselves or that they would be different to their online profile. There was no difference between genders, with over half of the women and men who responded stating they worried people were not who they claimed to be. The word "catfishing" was used by one in five people who answered the question.

*people may not appear to be who they've made themselves out to be. Someone could look completely different to what is shown on their profile picture or worse still, not actually the person in the photograph. (gay woman, MS)*

*That they won't be the person they say they are (bi/pansexual woman, CT)*

Danger, safety or a physical threat were the second most common issues participants worried about. Many of these responses were quite generic and just referred to danger or safety but some were specific and mentioned particular fears. Four respondents mentioned sexual violence specifically. This response was more common in men (two in five) than women (one in four).

*Safety, especially when meeting cis men. (bi/pansexual woman, CT)*

*I do sometimes worry about being like kidnapped or kept in a flat for a few days against my will (gay man, MS)*

*I am scared of being physically murdered (gay man, CT)*

The third most common worry related to sexual health. This was predominantly a worry for men with one in five men who responded stating they were worried about STIs or HIV. Only two women stated they were worried about sexual health.

*People you meet on apps tend to want riskier sex (gay man, CT)*

*People could not be who they propose to be and these people could be carrying STIs (gay man, MS)*

The fourth most common response was to state they were not worried about anything; one in ten women and one in fifteen men stated this. It might be that others who left this question blank also felt they were not at all worried, however these eleven people actively stated this.

The other less common themes from this question related to; fears apps made people shallow, judgmental or apps were dehumanising; fear of rejection or having to reject someone; misunderstandings of intentions and what people want from apps; concern about online stalking, trolls or harassment; and fear of homophobia or transphobia attack.

The third open text question was asked "Have you had any negative experiences when using these apps that you would like to tell us about?", and 159 participants provided a response to this (75% of women and 78% of men).

Men reported more negative experiences on GSN apps. The most common response for men and women was that they had had no negative experiences; however, over half of women who answered the question stated they had had no negative experiences whereas less than a third of men stated they had no negative experiences. Two in five men and a quarter of women who reported negative experiences said they had experienced catfishing, deception or people misrepresenting themselves in pictures or with the information they state on apps

*A guy showed up at my door. It wasn't him in the pic. We argued and he left (gay man, MS)*

*Yes I've had people put fake profile pics on and when I go to meet them they look totally different. (bi/pansexual man, CT)*

One in four women and one in seven men (who reported negative experiences) reported being rejected or ghosted by people on an app. Less than one in ten people (similar proportion of men and women) reported having been sent abusive messages, being harassed online or receiving threats online. Other common responses

included people being rude, inconsiderate or having bad manners on apps. Ten people reported sexual assault or non-volitional sex and eight people reported violence or in-person harassment.

## 5.10 Discussion

This study aimed to understand how LGBTQ+ people in CT and MS use GSN apps. As far as I am aware this study is the first to compare app usage in two areas and across genders. The overall findings show there were no significant differences between how apps were used in the two study sites, therefore we may be able assume previous research with MSM in the USA is likely to be generalisable to the UK. However, not surprisingly, there were many significant differences in how men and women used apps and some outcomes were associated with age, motivations for using apps, proportion of LGBTQ+ friends who use apps and sexual orientation. The positives of apps, fears and negative experiences provided in the open-ended questions were used to design the qualitative phase of this thesis (see section 6.1 and 6.3).

The sample is consistent with other studies that show MSM app users are predominantly younger, white, identify as gay and are well educated (Burrell et al., 2012; Beymer et al., 2014; Phillips et al., 2014; Holloway et al., 2015; Miller, 2015; Wang et al., 2018). However, without comparing app users against non-users we cannot know if the characteristics are those of app users, or just those who agreed to take part in the study. As this is the first survey research with other members of the LGBTQ+ community, it is not possible to know if this sample is representative of WSW and non-binary app users. Most of the comparison with existing literature focuses on previous research with app-using MSM. The high levels of education in the sample may also be influenced by the main areas of recruitment; both Liverpool and New Haven have multiple large universities and recruitment materials were shared through university networks.

Findings show four in five CT participants, compared to half of MS participants, stated they were a member of a group who were discriminated against in their country. This may be due to ethnicity, as a higher proportion of participants in CT were people of colour (28%; compared to 4.5% in MS), however, the question prompted a variety of options related to protected and minority characteristics. Minority stress theory suggests those who perceive themselves to be in a minority experiencing discrimination will have worse health outcomes (Meyer, 2003; Mink et al., 2014). Three outcome measures were significantly associated with a perception of minority status; those who felt they were members of a group discriminated against logged on to apps fewer times per day, spent fewer minutes on apps per day and met a lower proportion of their sexual partners on apps. These three measures suggest lower app engagement by those most likely to feel minority stress; possibly because they do not feel comfortable or welcome on GSN apps. This could be due to experiences of discrimination or racism which have been reported by MSM who use GSN apps (Callander et al., 2016; Lauckner et al., 2019; Thai, 2020); these issues are further explored in study 2 (see section 7.3.4).

### 5.10.1 Differences between the apps

Very similar apps were used by participants in the two areas. There were, not surprisingly, clear gender differences in the apps used. For men the most popular apps were Grindr, Tinder then Scruff. For women they were Tinder, HER and Plenty of Fish. Sex-seeking online and increased sexual risk behaviour were common in MSM even before the invention of these GPS-based apps (Liau et al., 2006; Lewnard and Berrang-Ford, 2014).

Of the top five most popular apps only one, Plenty of Fish, was a website before developing a smartphone app; the other popular apps were all launched by new companies in the last ten years. From my results it appears that the users of the popular MSM and WSW websites did not just transfer their use onto the app versions of the websites. The research on websites may no longer be wholly relevant, as it appears users are seeking a new element of the apps, possibly the location based technology that focuses on proximity and immediacy (Blackwell et al., 2015; Licoppe et al., 2016). This is explored in the qualitative interviews.

Use of Grindr was higher in both areas (92% of men) than in the few research studies which have asked about use of specific apps (in two US studies 77% and 78% MSM had ever used Grindr; Lehmler and Ioerger, 2014; Beymer et al., 2016). The high use of Grindr in this study may be because as time goes on the chance of men trying it is likely to increase. Almost a third of men in the sample once had a Grindr profile but have now deleted or deactivated it – this is explored in detail in the qualitative study. Use of Grindr was near ubiquitous despite not using the brand on any recruitment materials; this may be because, for many men, “dating/hook-up app” is synonymous with Grindr (Woo, 2015). It was not possible to examine risk behaviour of Grindr users versus non-users as only eight men had never used Grindr. Multiple app use by MSM is common; findings show over 70% of men had used Tinder and nearly three in five had used Scruff. Even in studies recruiting MSM through Grindr, high proportions of respondents use other apps; for example a study in Atlanta, USA, found over half of Grindr users also had a current Scruff profile, nearly half had a Jack’d profile and one in five had a current Hornet profile (Duncan et al., 2018b).

Findings showed differences in the types of people using specific apps. Younger participants and those who identified as bisexual/other/no term were more likely to have ever used Tinder, most likely because Tinder allows you to date all genders. Men who used Scruff were likely to be older and reported the highest number of app partners in the previous 12 months but a similar number of overall partners as those who had ever used Grindr. Previous research has tended to group all men’s GSN apps together (Miller, 2015; Griffiths et al., 2018; Hahn et al., 2018; O’Connor et al., 2018), or focus solely on Grindr users (e.g. Rendina et al., 2014; Goedel and Duncan, 2016; Duncan et al., 2018a; Thai, 2020). However, if research and health promotion assume “Grindr” and “men’s dating/hook-up apps” are interchangeable, a proportion of potentially risky users of apps might be missed, either because they no longer use Grindr or mainly use other apps. Health promotion and research cannot focus solely on Grindr users.

For women in both areas the line between relationship and hook-up apps appears to be blurred with Tinder being popular to find serious and casual partners. There are very few apps aimed solely at women. HER appeared to be viewed as a more relationship focused; HER focuses on sociability (Murray and Ankerson, 2016) and intentionally distances itself from other GSN apps and positions itself as more than a hook-up app (HER, 2019). In the general population Tinder is usually associated with casual sex (David and Cambre, 2016; LeFebvre, 2018) and presented in the media as a “hook-up app” (Sales, 2015; Kalia, 2019). However, some research shows this may be changing as younger heterosexual Tinder users are more focused on finding romantic relationships than hook-ups (Sumter et al., 2017). There are few apps for WSW and, as the most popular GSN app with a huge number of users, Tinder may be worth using it to find potential romantic partners

even when it has a reputation for casual sex. This lack of clarity around which apps are casual-sex or relationship focused could lead to miscommunication, confusion, rejection or heartache – all of which can have a detrimental effect on mental health.

For men there was a clearer line between casual sex and serious relationship apps. In both areas, as would be expected, three quarters of men thought Grindr was the best app for casual hook-ups. Nearly half of men said they would use Tinder for a serious relationship with nearly a quarter saying that would not use an app to find a serious relationship. In contrast to its reputation in general culture as a hook-up app, in the UK Tinder has a reputation amongst gay men as a place to find “nice guys” and thus look for a relationship (MacKee, 2016).

These findings show that GSN apps cannot be viewed as a homogenous technology; different apps are used by different people and for different purposes. The crossover of uses, with Tinder especially being viewed by women as both a serious relationship and casual sex app, may give mixed messages and lead to miscommunication between users who have different expectations and potential emotional implications if rejected or hurt. Grouping all apps together under the category of risky or hook-up app in health promotion may alienate users, and conversely stating names of only specific apps may miss many app users.

### **5.10.2 Reasons for using GSN apps**

There were significant differences in the reasons men and women gave for using apps; generally, women were more likely to be looking for relationships, romance and dating. The reasons men used GSN apps were generally more about sex; finding sex partners was the main motivator for nearly a third of men but over three quarters of men said sex was one reason they used apps. Similar to these results, when asked one reason for app use, 38% of Grindr users in Atlanta are looking for sex but when allowed to choose multiple reasons 62-67% of young MSM in California use apps to find sexual partners (Landovitz et al., 2013; Holloway et al., 2014b; Goedel and Duncan, 2015). Although sex may not be the primary motivator for some, it is one factor and likely to impact on behaviour and health outcomes.

Apps also appear to be a route for some people to connect to the LGBTQ+ community, with one in five participants stating the main reason they use apps was to look for friends. This is similar to research with young MSM in Scotland, Wales and Ireland and which found a third use GSN apps to find new friends and connect with a gay community (Lorimer et al., 2016). Interviews with young black MSM in the US found isolation and a disconnect from a “gay community” was common; these young men were receptive to a social networking intervention (though not specifically a GSN app) designed to address this (LeGrand et al., 2014). Our findings showed participants looking for friends had lower Outness scores and were therefore more “in the closet”. Social support is linked to better health and wellbeing in the general population (Gruenewald and Seeman, 2010; Ikeda and Kawachi, 2010) and LGBTQ+ people who are in the closet often report isolation and loneliness (Schwitters and Sondag, 2017). Social cohesion and support from the LGBTQ+ community can promote psychological wellbeing and is linked to improved self-esteem, self-efficacy, and long-term health outcomes (Detrie and Lease, 2007; Heath and Mulligan, 2008; Doty et al., 2010). Those whose main reason for using apps was that they were bored or killing time were the most “out”, suggesting they may be less in need of

social connections or community. Promoting the friendship potential of apps could encourage social support and social cohesion, and thus reduce health inequalities.

Most people chose more than one reason for using apps and although more closeted people stated their main reason for using apps was to make friends and connect to the community, there are likely to be sexual outcomes for these individuals too. Closeted MSM and those who have negative feelings about homosexuality are more likely to engage in sexual risk behaviours and be less knowledgeable about HIV and HIV testing (White and Stephenson, 2014; Berg et al., 2015). Services and health promotion need to acknowledge that even those who are predominantly looking for friends and community on apps may still be at risk of negative sexual health outcomes.

### **5.10.3 Participants meeting different types of partners on apps**

Research on MSM seeking partners online has struggled to examine the causal relationship between choosing an online route for sex and any risk-taking behaviour (Lewnard and Berrang-Ford, 2014). There are two possibilities; GSN apps encourage users to have more sex or alternatively those who want more sex use GSN apps to meet this existing need or desire. To explore how apps might be influencing sexual behaviour participants were asked if they felt their app partners were any different to partners they had before using apps. Almost one in five participants said they did not meet same-gender partners before they used apps. This was not significantly associated with age suggesting it is not because they were too young to date or hook-up before apps were invented. It could be that wanting to meet same-gender partners coincided with developments in technology which provided more opportunity to meet other LGB people, or alternatively the availability of new GSN app technology encouraged people to explore meeting same-gender partners. However, even before the invention of GSN apps, online dating and online hook-up sites were very popular so it seems unlikely the apps will have caused people to start meeting same-gender partners.

Although a third of all participants felt that “app partners are easier to meet”, nearly a third felt their app partners were no different. There were no differences between CT and MS. Only one study has examined how app-users perceive how GSN apps may have changed the types of partners they meet. In a study of Grindr users in LA (recruited on the app and in gay venues) the most common change was that Grindr partners live closer to the participant (45%) and are easier to meet (43%; Landovitz et al., 2013).

Only a quarter of survey respondents felt they have more sexual partners now they use apps, which is similar to the 22% of MSM in the LA study who thought that they had more partners now they used Grindr (Landovitz et al., 2013). A logistic regression model showed motivation was the key factor in determining whether people have more partners now they use apps; those who indicated one of the reasons they used apps was to meet sexual partners were three times more likely to state they have more partners now they use apps. This adds to the evidence showing effort put into sex-seeking and numbers of avenues used to find sex partners are key predictors of risk (Allen et al., 2017; DeVost et al., 2018; Dangerfield et al., 2020; see section 5.10.4). Further longitudinal research, with large sample sizes that allow for more sophisticated statistical methods, are needed to examine if apps are a causal factor in increasing numbers of sexual partners. The qualitative phase of this research explores how participants feel apps may have changed their dating behaviour and how they would



meet same gender partners if apps had not been invented. Our survey did not ask about the sexual practice or any risk behaviour with these increased partners, but if only a quarter of survey respondents feel they have more partners now they use apps this would suggest apps are only increasing risk for a minority of people.

#### **5.10.4 Intensity of app use and risky behaviour**

As expected, there were significant positive correlations between number of times logging on, minutes spent on apps and messages sent per day. Frequency of app use was significantly higher for men than women – men logged onto GSN apps more times, spent twice as many minutes online, sent five times as many messages a day and used more individual apps than women. These were similar in both areas. Higher intensity and frequency of app use has been linked to lower self-control in app-using MSM (Beymer et al., 2016) and people who show lower self-control are likely to take more sexual risks and have more negative sexual health outcomes (Adam et al., 2008; Moilanen and Manuel, 2018). The men in our study were using apps less often than in previous research; two US studies found men log on to GSN apps more frequently, spend longer on apps and send more messages than the men in this study (Goedel and Duncan, 2015; Beymer et al., 2016). However, we examined medians and both these US studies show large standard deviations and the means were likely influenced by outliers. Other studies have used different measures of frequency, so comparison is difficult.

Men reported five times as many overall partners, and three times as many app partners, as women. Those identifying as bisexual/other/no term reported half as many overall and app partners, most likely due to the high proportion of women in this group. Overall, participants reported they met 80% of sexual partners on apps; this proportion was similar across all genders, areas and sexual orientations.

It appears that, especially for men, there is a link between the time and effort put into apps and number of sexual partners. Those whose main reason for using apps was to find sexual partners reported highest frequency of app use and the highest number of sexual partners. As expected, using more individual apps and having used apps for longer was linked with higher number of partners and higher frequency of app use. Understanding the link between app use and number of partners is important, as higher numbers of sexual partners have been linked to sexual risk and increased STIs for MSM in many European and American studies. Higher numbers of sexual partners are associated with increased odds of STI diagnosis in general samples of MSM (Jakopanec et al., 2010; Marcus et al., 2015). MSM with higher numbers of sexual partners are more likely to report condomless anal intercourse (Schwarcz et al., 2007; Marcus et al., 2015) and higher HIV risk (Brewer et al., 2006; Koblin et al., 2006). Grindr users who report higher number of partners are more likely to have condomless anal intercourse (Winetrobe et al., 2014) and amongst app users higher numbers of sexual partners are associated with STI diagnosis (Allen et al., 2017). However, similar to previous research (McDaid et al., 2013), findings showed an encouraging linear trend with those reporting a higher number of sexual partners more likely to have had a recent HIV and STI test. Health promotion needs to target MSM who use GSN apps to ensure this positive health protective behaviour is maintained, especially among younger people and those who may be new to GSN apps.

There is a complex relationship between number of partners and app use for men and one must be careful not to infer a causal relationship. More sex may be an outcome for those who use more apps, started using them

longer ago and use them more times a day. However, it may also be that those who are more motivated to find partners and want more sex dedicated more time per day to apps, use more apps and started using them when they first came out. Whatever the relationship, it is reasonable to suspect it is self-perpetuating with success on apps (having sex) inspiring further use. Evidence seems to show it is the effort, time or variety of methods used to meet partners that is associated with sexual risk-taking behaviour in MSM, not GSN app-use itself. Research in Paris found app use itself was not an indicator of risk but the use of multiple avenues to find sexual partners that was associated CAI, group sex and sex tourism (Dangerfield et al., 2020). Black and Hispanic/Latino MSM in the USA who use both GSN apps *and* websites were more than twice as likely than those using only apps to report an STI diagnosis (Allen et al., 2017), and a study in an STI clinic in Los Angeles found a dose-response relationship between the number of venues used to meet partners and testing positive for any STI (DeVost et al., 2018). However, this PhD study only asked about behaviour on apps, not sex-seeking through other avenues, and cannot draw any conclusions about cause and effect. Further UK research needs to explore if sexual sensation-seeking (Kalichman and Rompa, 1995) mediates the relationship between the range of methods employed or frequency of technology use, and risk-taking behaviour.

#### 5.10.5 Bisexual and plurisexual app users

The respondents from CT were substantially more “queer” and referred to their gender and sexual orientation in less binary terms than the MS respondents. A significantly higher proportion of CT respondents chose a gender other than man or woman; had a trans history; and identified as a sexual orientation other than gay, lesbian or homosexual. Only half of CT participants reported sex with *only* same-gender partners in the last 12 months, compared to three quarters of MS respondents. The proportion using apps to also meet opposite gender partners varied from 5% of men in MS to 29% of women in CT. Large national studies in western countries show consistent differences between men and women in terms of sexual behaviour and identity; in the UK (Mercer et al., 2013), USA (Herbenick et al., 2017) and Australia (Richters et al., 2014) women are more likely than men to report plurisexual identities, same-sex attraction and experience.

Bisexual and plurisexual people report worse mental health outcomes compared to both heterosexual and to gay and lesbian people (King et al., 2008; Colledge et al., 2015; Taylor, 2018). The increased incidence of mental ill-health may be due to a heavier burden of minority stress, social stress due to the 'double discrimination' of homophobia and biphobia (Colledge et al., 2015), bisexual erasure/invisibility (Barker, 2015) or barriers to healthcare (Smalley et al., 2015). Although logistic regression modelling found sexual orientation was the key factor associated with using apps to meet opposite-gender partners, almost half of the plurisexual participants only met same-gender partners through apps. This suggests many people who might potentially use apps to seek opposite-gender partners, choose not to. This was investigated further in the qualitative section to understand how plurisexual people use apps to meet men and women.

Those who used apps to also find opposite-gender partners had significantly lower “out to family” scores than those who did not, suggesting that those who are plurisexual are more in the closet and less likely to discuss their sexuality with their family. Plurisexual people tend to be less out than lesbian and gay counterparts (Taylor, 2018) and closeted and bisexual/plurisexual MSM report higher levels of internalised homonegativity (Berg et

al., 2015), which may also contribute to minority stress. Specific health promotion interventions are needed for plurisexual app users. Previous research on app use has not examined sexual orientation or whether people also use apps to meet opposite-gender partners. The increased rates of mental ill-health and sexual risk-taking in bisexual and plurisexual people warrants further examination of the relationship between GSN apps and health. Perceived health outcomes of GSN app use as well as strategies for safe app use are further explored in the qualitative phase of this PhD.

#### **5.10.6 Peers and social norms**

There appears to be an association between behaviour on GSN apps and the proportion of LGBTQ+ friends who use GSN apps. Those who reported all or most of their LGBTQ+ friends used GSN apps reported significantly higher numbers of overall partners, higher number of app partners, logging on more times, more minutes on apps and sending more messages per day.

LGBTQ+ friends also had an association with participants meeting different types of partner on apps. The more LGBTQ+ friends who use apps the more likely a participant was to say app partners are easier to meet and they have more partners now they use apps. In the logistic regression model, motivation for app use and proportion of LGBTQ+ friends who use apps were the only predictors of participants saying they had more sexual partners now they used apps; those who reported all or most of their LGBTQ+ friends used GSN apps were almost four times more likely to say they had more sexual partners now they used GSN apps.

As use of GSN apps become more widespread, normative behaviours are likely to develop. Grindr has been common in MSM communities for ten years; even only 12-18 months after its launch, 29% of young MSM in LA reported all or most of their friends used Grindr (Landovitz et al., 2013). Previous qualitative sociological research has found casual sex and sex-seeking are established social norms on Grindr in the UK, USA, Hong Kong and France (Blackwell et al., 2015; Licoppe et al., 2016; Yeo and Fung, 2016; Jaspal, 2017). In our study, significantly more men than women reported all or most of their LGBTQ+ friends used GSN apps indicating gender may be a factor in predicting the relationship between social norms, frequency of app use and numbers of sexual partners. However, gender was not a predictive factor in the logistic regression model which predicted having more sexual partner now they use apps. For all genders it appears having more LGBTQ+ friends using GSN apps is linked to participants stating they have more sexual partners now they use apps.

In the general population and amongst MSM, perception of social norms influences risky behaviour including sexual activity, timing of sexual debut, HIV testing, chemsex and contraception choice (Sieving et al., 2006; Potard et al., 2008; Madden et al., 2014; Ahmed et al., 2016). Incorrect perception of normative behaviour is associated with increased rates of said unhealthy behaviours (Reid et al., 2010) and the social norms and expected behaviour on GSN apps may be further increasing users' likelihood of having more sexual partners and encouraging people to seek more sex. Interventions, possibly on the apps themselves, that provide more accurate information about true norms may produce positive changes in health behaviour (Reid et al., 2010). Information regarding prevailing social norms can be used to design and target prevention programmes.

However, the findings in this study may be limited by the wording of the question about proportion of LGBTQ+ friends using apps. This question was taken from a study with MSM in Los Angeles recruited through Grindr

(Landovitz et al., 2013). They found only 16% of men reported that only “a few” or “none” of their MSM friends used Grindr, compared to 29% of participants in this study indicated said “a few” or “none” of their LGBTQ+ friends used GSN apps to find same gender partners. This is most likely because our sample also included all genders and GSN app use may be less common in WSW. The answer options are quite ambiguous (all, most but not all, many, some, a few, none) and this question could be improved. Further research is needed to investigate the relationship between app use, risk-taking behaviour and social norms for LGBTQ+ people, and indeed this is explored further in the qualitative section of this thesis.

#### **5.10.7 Health benefits and risks of using GSN apps**

The final section of the survey asked three open ended questions about how participants view the health benefits, potential risks and any negative experiences of using of GSN apps; the findings were used to design the mock-up profiles and interview guide in the qualitative phase of this research (see section 6.3). The main benefit of GSN apps, reported by men and women but more important to men, was that apps were easy, convenient or a fast way to meet partners. For women there appeared to be more of a focus on increasing the pool of potential partners, providing contact with people outside of their social circle and allowing them to get to know people before meeting.

Participants were worried about people on apps being dishonest or deceptive, indeed a fifth of participants used the word “catfish”. Physical danger, safety or violence also worried participants; this was more common in men but still an issue for women. Men were also worried about sexual health, STI and HIV risks. Despite this variety of fears, most participants had not had any negative experiences on apps; those that had reported catfishing, deception or people misrepresenting themselves in pictures, profile text and messages. Rejection (including ghosting) and online harassment were also reported by some. These echo the experiences reported in a qualitative study with MSM living in southern rural USA, half of whom who described experiences of deception or “catfishing”, discrimination and harassment (Lauckner et al., 2019). Previous research has also shown MSM worry about their physical safety and fear violence perpetrated by people they meet on GSN apps (Miller, 2015; Albury and Byron, 2016; Macapagal et al., 2016; White Hughto et al., 2017; Lauckner et al., 2019). The existing evidence base appears to look at what people are *worried about* or has used qualitative methods to investigate any negative experiences. Quantitative research is needed to measure the prevalence of deception, violence and other crimes experienced by people on apps.

These three open-ended survey questions about risks and benefits elicited generally very brief, ambiguous answers without context, a common challenge in such survey questions (Reja et al., 2003; Lavrakas, 2008). These issues are explored in greater depth in all interviews and the mock profiles (section 6.3) include key themes shown in these survey questions (deception, catfishing and misrepresentation; proximity and partners being easy to meet; anonymity and possible danger; and sexual risk and HIV.)

#### **5.10.8 Limitations**

Although this innovative study is the first to examine GSN app use in two areas and across all genders, it does have some limitations. The most obvious limitation is the sample size and the uneven sample in CT (n=74) and MS (n=133). When sliced into four categories based on gender and area, some of the groups were very small

(n=30-75) which limited analysis and reduced statistical power. This was especially noticeable in CT which already had a smaller sample size and the 14% of participants (n=10) identified as another gender so were excluded from any analysis comparing men and women.

Smaller sample sizes are common in research with app-using MSM, even when researchers were able to recruit through apps (e.g. Gibbs and Rice, 2016; Goedel et al., 2016b; Goedel et al., 2017c; Duncan et al., 2018a). Previous surveys with large samples (>250 GSN apps users), have recruited through large national government-funded projects (Cabecinha et al., 2017; Badal, 2018), in sexual health clinics (Beymer et al., 2014; Chan et al., 2018) or advertised through apps themselves (Landovitz et al., 2013; Holloway et al., 2015; Macapagal et al., 2016; Griffiths et al., 2018; O'Connor et al., 2018; Luo et al., 2019). None of which were options for this study (see reflection box 4.3). The small sample in CT was particularly disappointing given the size of the state and the multiple recruitment approaches utilised. Recruiting participants over a wider geographical area may have helped to increase the sample size, for example New England (USA) compared to North West (UK), however this would have made comparisons harder as LGBTQ+ protection legislation differs by state.

The method of recruitment is also a limitation. It is likely that both the stratified Facebook sampling and the purposive sampling through other online avenues has introduced bias and has impacted on the generalisability of the findings. However, as discussed in the methodology, all GSN app users are users of smartphones and online technology, therefore a sample recruited online is likely to be similar to the app-using population.

Some of the specific challenges of conducting survey research with LGBTQ+ populations is discussed in detail in section 4.2.2. This research would have benefited from measuring specific sexual health outcomes, such as validated tools to assess sexual health or HIV/STI risk behaviour, however finding tools valid for all genders and sexual orientations is difficult. Even with routing based on gender, questions about sexual health and sexual activity are difficult. Not all people who identify as one gender have the same physiological characteristics or genitals which has implications for the sex and "safer sex" they may be able to or need to practice. For example, most previous research on apps asks about HIV testing and unprotected anal intercourse (Rice et al., 2012; Rendina et al., 2014; Queiroz et al., 2017), questions which are mainly appropriate for cis men.

## 5.11 Summary of survey findings

- The same GSN apps were used in the two areas, the big difference was between men and women. Grindr use was nearly ubiquitous for men, although a third no longer used it. Multiple app use was common for all genders. There were some differences between app users - plurisexual people more likely to have ever used Tinder and Scruff users were older and report highest number of app partners. We cannot group all apps together in health promotion or assume all are "risky".
- For men the purpose of the main apps was clearer – Grindr is for casual sex and Tinder is for more serious relationships. It was less clear for women, possibly because there is less choice and women may have to choose the apps with highest number of users.
- Motivations for app use varied between genders, generally women were more likely to be looking for relationships, romance and dating; men were more sex focused. However, for all genders, apps are used

to look for friends and community – especially by who were less “out”. This social cohesion could help reduce isolation and improve health.

- Intensity of app use was significantly higher for men than women – men logged onto GSN apps more times, spent twice as many minutes online, sent five times as many messages a day, had used apps for longer and used more individual apps than women.
- Apps make it easier to meet partners and a quarter of participants felt they have more partners now they use apps. Motivation was important – using apps to find sex partners was associated with higher numbers of partners and having more partners now they use apps.
- There is a complex relationship between intensity of use (including frequency of use, years using apps and number of apps used) and number of sexual partners. We cannot infer a causal relationship but looks like it is intensity of sex-seeking, not app use alone, that is linked to risk.
- Men may have higher numbers of partners but across all gender, area and sexual orientation groups participants met 80% of their sexual partners on apps.
- Plurisexual participants were more in the closet and half seem to be choosing not to use apps to meet opposite-gender partners. Plurisexual people have worse health; specific health promotion and research is needed.
- There is a relationship between social norms and behaviour on apps - those who reported all or most of their LGBTQ+ friends used GSN apps reported significantly higher numbers of overall partners, higher number of apps partners, logging on more times, more minutes on apps and sending more messages per day, and were four times more likely to say they have more sexual partners now they use apps. A social norms approach could be used to understand normative behaviour and then correct any misperceptions.
- Main benefits of app use were increasing pool of partners and making it easier to meet partners. App users were worried about deception and catfishing, violence and threats to their safety. However, most participants had no negative experiences though some reported rejection, ghosting, deception and harassment. These are explored further in the qualitative study.

These findings were used to design the data collection methods for the qualitative phase of this research (sections 6.1 and 6.3).

## Chapter Six | Qualitative Interviews Methodology (Study 2)

This second study further explored the how individuals use GSN apps to find same-gender partners; it investigated what influences behaviour on apps, how people perceived risks and benefits of using apps and how they modified their behaviour or any strategies they had to maximise benefits and reduce risks to health. This study also investigated if the behaviour differs between Merseyside and Connecticut, and what cultural influences may be causing any differences. Differences between gender, age and sexual orientation groups are also explored.

### 6.1 Refining the focus of study two

The focus of study two was informed by the literature and the preliminary analysis of the online survey. Preliminary analysis was conducted on the 144 survey responses received by April 2018 (70% of the final sample), although only 15% of this sample was from Connecticut. This analysis initially suggested that men should be the focus of the second study; men reported higher numbers of sexual partners, a higher proportion were looking for sex on apps and more risk-taking, harassment and negative experiences were provided by men in the open-ended questions. There was also concern about the feasibility of attempting to understand the views and experiences of the whole LGBTQ+ population of Connecticut and Merseyside. This is not a homogenous group and it would be challenging to recruit a sufficient sample. However, as this is an exploratory and descriptive qualitative study, that is not aiming to generalise, a large sample size is not as crucial (Tolley et al., 2016)

The literature review found no qualitative studies examining the health impacts of GSN apps for WSW or non-binary people and only a few with MSM (section 2.8). The few qualitative studies that examine use of GSN apps focus on MSM (Blackwell et al., 2015; Brubaker et al., 2016; White Hughto et al., 2017; Filice et al., 2019; Lauckner et al., 2019) or male sex workers (Ryan, 2016). Discussion with community stakeholders, including those who work in sexual health and LGBTQ+ services and people who run an LGBTQ+ media outlet in CT, revealed research overlooks WSW.

The research on WSW often focuses on reproductive or sexual health; even though we know women and non-binary people experience domestic abuse (Badenes-Ribera et al., 2016), racism (Held, 2017) and bisexual women have poorer mental health outcomes (Colledge et al., 2015). Although the survey did not indicate high sexual risk-taking behaviour amongst the WSW or non-binary respondents, it is important to investigate how else GSN apps may be influencing other health outcomes for WSW and non-binary individuals. The survey findings also informed the mock profile text and the most popular apps were used as a template for the profiles (see section 6.3.2)

### 6.2 Qualitative approach

Qualitative methods help us understand why people do what they do and give a more detailed understanding of subjective experiences than quantitative methods (Karasz and Singelis, 2009). Qualitative research is particularly advantageous when researchers want to delve beneath the surface and understand complex and sensitive attitudes, behaviour and experiences (Bowling, 2014). Previous research has used grounded theory



interviews to explore GSN app by MSM in rural areas of the USA (Schipani-McLaughlin et al., 2017; Lauckner et al., 2019). They recommended further research to explore wider health and mental health impacts of GSN app use is needed to improve services for MSM.

This study will use a generic qualitative research approach to understand experiences, attitudes, beliefs and behaviour. Phenomenology also explores these feelings but investigates the *experiencing* rather than the *experiences*; phenomenology focuses on internal subjective structures and the inner essence of cognitive processing (Percy et al., 2015). Unlike grounded theory, this study is not aiming to develop a theory or explanation of app use, this study is descriptive not explanatory (Percy et al., 2015). Generic qualitative research is not guided by an explicit or established set of philosophic assumptions like these other qualitative approaches (Caelli et al., 2003).

Generic qualitative inquiry is particularly appropriate for mixed methods research as the qualitative findings can be combined with the quantitative findings (Caelli et al., 2003; Kahlke, 2014; Percy et al., 2015). It is also appropriate for research where we already have some knowledge or understanding of the topic which need describing from the participants' perspectives (Percy et al., 2015); in this case there is a reasonable amount of quantitative research about MSM and GSN apps it needs explored in further detail. The flexibility of inductive thematic analysis makes it compatible with generic qualitative research (Braun and Clarke, 2014; Kahlke, 2014; Percy et al., 2015).

One-to-one interviews were chosen instead of focus groups as they enable the establishment of a relationship between the interviewer and interviewee and are more appropriate for discussion of sensitive topics such as sexual or mental health (Ulin et al., 2005; Bowling, 2014; Tolley et al., 2016). The main limitation of interviews is they are time-consuming to organise, conduct, transcribe and analyse (Bowling, 2014), although, this is the worthwhile compromise for such rich and personal data. There is also a greater possibility for interviewer bias, in both the interview itself and during the analysis (Bowling, 2014). However, Karasz and Singelis (2009) argue that qualitative and mixed methods are not more inherently subjective than quantitative research; it is just that qualitative researchers may be more likely to articulate their own biases. The bias of the quantitative research is present in choice of method, sample and design of instruments – all set before the research starts. For qualitative research bias can come later in the process and the researchers try to mitigate this with reflexivity, member checking and review by participants (Karasz and Singelis, 2009). To avoid the problem of memory bias (Bowling, 2014) only people who currently use GSN apps or who have used them in the previous 18 months were interviewed. See section 6.5 for discussion of rigour and trustworthiness in the interviews.

Semi-structured interviews were chosen as they allow all participants to cover the same general topics and produce comparable data across all genders (Tolley et al., 2016). Unstructured, entirely inductive, interviewee-led interviews would be too unpredictable to answer this research question (Olsen, 2012; Mclean et al., 2020), and are not suited to generic qualitative research (Percy et al., 2015). Semi-structured interviews permit flexibility whilst maintaining a focus on the research question and allow the researcher to move back and forth through the topic list based on the interviewee's responses (Given, 2008; Mclean et al., 2020). Semi-structured interviews have previously been used to explore the body image-related issues of Grindr users in Netherlands

(Filice et al., 2019), and how living in small cities affect MSM's use of GSN apps (study conducted in Connecticut; White Hughto et al., 2017).

## 6.3 Interview procedure

All potential participants were offered face-to-face or online video chat interviews; most (32/33) opted for face-to-face. Only one participant Bailey (CT), chose to do an online video interview as it was not easy for them to meet in person. The video interview was conducted in Google Hangouts and the mock-profiles were shown to them using the "share my screen" feature. The audio was recorded with the standard Dictaphone, no video was recorded. The process was the same otherwise. All interviews lasted between 55 and 110 minutes with most lasting 80-90 minutes. Interviews were conducted in Merseyside between September 2018 – May 2019, and in Connecticut in November 2018 and April 2019.

### 6.3.1 Interview guide

The discussion guide was developed based on preliminary analysis of the survey data which revealed that apps are not homogenous and different apps were used for different reasons. The prompt questions investigated why people chose different apps and how they learnt about the purpose of different apps. The survey also revealed differences in the reasons men and women use apps; men tended to be more focused on sex and women on dating or relationships. The semi-structured guide was identical for all participants, but the flexible approach allowed the interviews to explore these issues. The survey results also informed the design of the mock profiles; the men's profiles were more sexualised, both sets included references to possible deception and the most popular apps were used as the template for the profiles (see section 6.3.2 for more detail). In the preliminary analysis a large proportion of participants in CT identified as a gender other than man or woman (11%) and as not gay, lesbian or bisexual (31%; proportion is even higher in the final sample). This suggested the qualitative phase should investigate how their identity might affect dating and health. There is still relatively little research that examines health differences between different sexual minority groups (Semlyen and Hagger-Johnson, 2017).

The discussion guide (see appendix H) included main questions and prompts, however this was not used in a formal or structured way. Every interview started with some contextual questions (age, gender, sexual orientation, job, where they lived) and the next question topic asked how "out" people were, and if this was important to them. The third question then introduced the topic of GSN apps and after this, due to the semi-structured nature of the interview, the remaining questions were covered in any order.

The final phase of the interview, approximately 20-30% of the time, discussed the mock-up GSN app profiles. Some of the gender specific issues, such as PrEP, barebacking, chemsex and threesome requests from man/woman couples were prompted by what the participants saw on the mock profiles.

### ***Main topic questions for semi-structured interviews***

- *Can I just ask a few quick questions for context so I know who I have been talking to?*
- *How "out" would you say you are?*
- *Talk me through how long you've been using apps*
- *Which apps do you use?*
- *Can you talk me through what you tend to be looking for on apps?*
- *Why do you use apps as opposed to other ways of meeting people?*
- *Can you talk me through some of the positives of using apps?*
- *Are there any negatives about using apps or any things that worry you about using them?*
- *Do you think you have a healthy relationship with apps?*
- *Do you access any sexual health services regularly?*

### **6.3.2 Mock-up GSN app profiles**

Images were used during the final stage of the interview to encourage discussion of how participants use GSN apps and respond to different situations on GSN apps.

#### **6.3.2.1 Photo elicitation**

The images were versions of GSN app profiles, based on real profiles. Photo interviewing, also called photo elicitation, is a way of integrating photos and images into interviews and are used as a stimulus to examine perceptions, understand behaviours or evoke memories (Schwandt, 2007). Visual methods have grounding in sociology and anthropology (Banks, 2007), and although common in public health research (Bugos et al., 2014; Sebastião et al., 2016) have not been used in research on GSN apps or online dating.

The images used in photo elicitation can be produced by either researchers or participants (Glaw et al., 2017). Images produced by the researcher can direct the topics of conversation and capture some taken-for-granted elements of a community or of a participant's life that can prompt discussion (Clark-Ibáñez, 2004). Specific examples of social issues or cultural norms, in this case stereotypical GSN app profiles, can become the basis for a broader discussion and can open up memories (Banks, 2007). The main limitation of researcher-produced images is that they can be irrelevant to the interviewee and instead of increasing intimacy, they might alienate the researcher (Banks, 2007). However, this was mitigated by basing the mock-profiles on specific examples from GSN apps and the open text survey answers and explaining this to the interviewee.

The inclusion of these images during these interviews served three purposes. Firstly the images can prompt memories and encourage more detailed discussion than simple questions (Glaw et al., 2017). In practice, this meant that the interviews covered topics that may not come up naturally in the interview so far. For two participants the inclusion of PrEP on the fake profile revealed they did not know about PrEP and also led to a conversation about how they did not feel confident about safer sex. The text on one men's profile said "white guys only" and this prompted many of the men to discuss the line between an acceptable preference and racism.

Secondly, the profiles provided a consistent way to investigate how participants made decisions and respond to the profiles, as photos can enable researchers to see how participants respond emotionally (Glaw et al., 2017).

During the profile discussions participants expressed several emotions that had not been evident during the earlier part of the interview including laughter, disgust, annoyance, sexual interest and confusion. Using the mock-profiles enabled the participants to discuss what they would do in particular situations and introduced a useful element of consistency between the interviews (Ritchie et al., 2013).

Thirdly, the profiles also allowed a more relaxed way to discuss some of the more sensitive topics such as bare-backing and HIV. Looking at the profiles gave the interviewee a slight break and allowed the participant to feel less “grilled” by the researcher – profiles acted as a neutral third party to focus on (Banks, 2007). The change of approach and focus on the mock-up profiles often reinvigorated the interview and the participants opened up even more. For example, a mention of HIV status on a mock-up profile prompted one participant to confide he would never date anyone HIV positive, saying he had never told anyone this before.

This is, to my knowledge the first research on GSN apps or internet dating to use simulated profiles to prompt conversation.

### **6.3.2.2 Producing the mock profiles**

Four profiles were aimed at people mainly looking to meet women and four aimed at people looking for men. The findings from the preliminary analysis of the survey informed the development of the mock profiles. Tinder was chosen as a template for women as it was the most popular app amongst women survey participants in both areas; 79% of women in CT and 90% of women in MS had (or had previously had) a Tinder profile. Grindr profiles were produced as it was the most popular app amongst men; 90% in CT and 93% in MS. The survey also showed that men are more likely to use apps to find sex so there were more explicit references to sex on the men’s mock profiles. The most common concern for survey respondents in an open text box was fear of misrepresentation, deception and catfishing on apps, so both sets included profiles that could be interpreted as suspicious or potentially deceptive.

To ensure profiles were as realistic as possible the eight mock-up profiles were developed using a hybrid of phrases or sentiments from real GSN app profiles. The researcher searched through Tinder and Grindr profiles in Liverpool and screen-grabbed a broad selection of profiles. These were then used to generate four different types of profiles for each gender. No direct text was taken from the real profiles and usernames and demographic information was changed. All photos were taken from Stock Image sites and any spelling mistakes intentional.

### **6.3.2.3 Women’s mock profiles**

The women’s profiles (figure 6.1 and 6.2) were designed to cover a variety of typical profiles seen on Tinder. Tinder profiles must include a photo, first name and age; the information about education and job are optional. The mock profiles were:

**1. Becca**, aged 31. This profile was intended to be an introductory neutral start to the discussion. The photo of an attractive woman and simple profile text was designed to be relatively appealing to most participants. A picture of women of colour was used to ensure the photographs presented a variety of ethnicity and explore this issue. In the UK version of this profile, her education was shown as University of Bolton.

**2. Hannah**, aged 28. This profile was intended to represent potentially suspicious, “faceless profile” or someone who was guarded about their appearance or identity. The “cat lady” is a common stereotype of lesbians - this profile was also intended to amuse participants with the picture of a cat, not a human. The text was slightly defensive and negative.

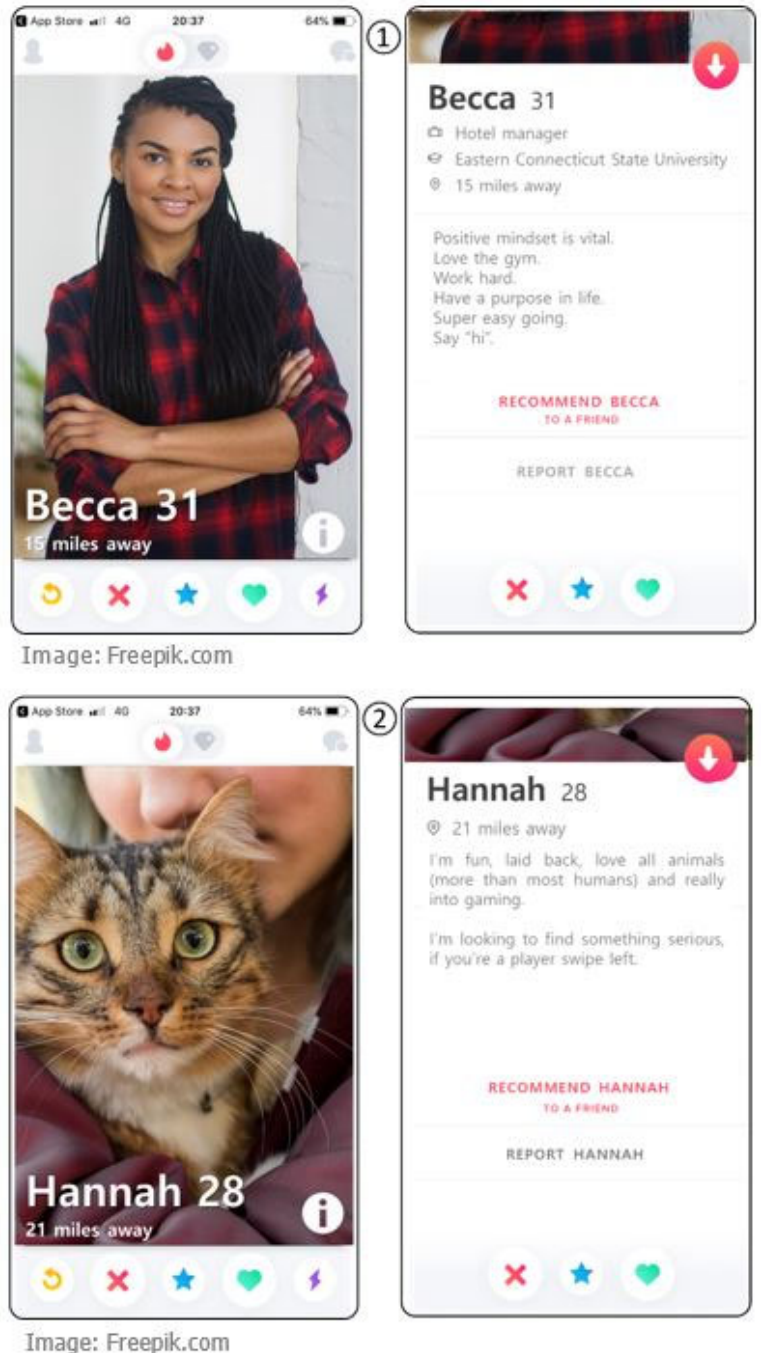


Figure 6.1: Women's mock profiles 1 and 2

**3. Katie,** aged 22. This profile represents the stereotype of the “bi-curious girl”; the text was designed to be controversial and prompt participants to discuss whether they would date “curious” girls who were “sick of men”. A photo of a women in swimwear was chosen as it is the most sexually explicit photo Tinder will allow.

**5. Kate,** aged 35. This profile represents an anonymous couple (man and woman) using apps to find women for threesomes. This is common profile on apps and was designed to assess whether participants would be interested in this type of sexual activity. This profile also aimed to understand how women respond to such requests from couples, and thus requests for sex from men. The phrase “I was bi before got married” was intended to prompt discussions around identity and heteronormativity.

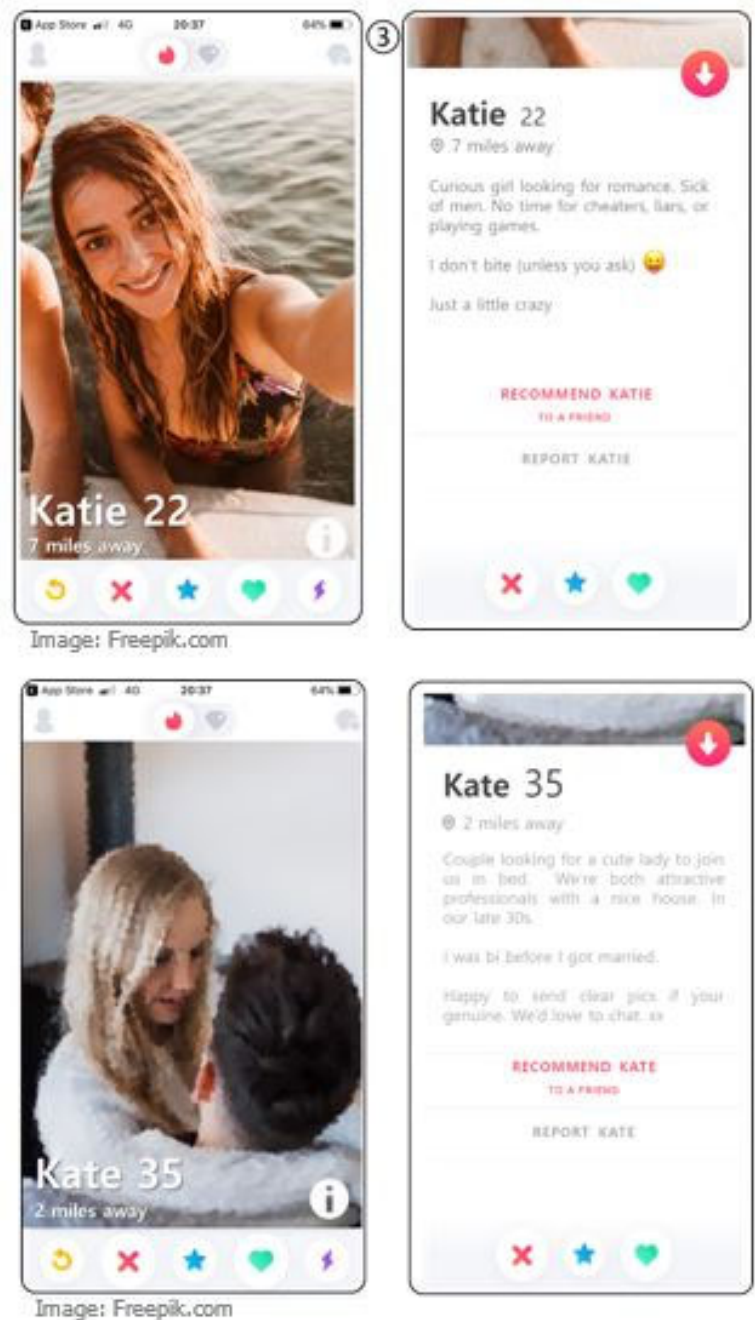


Figure 6.2: Women's mock profiles 3 and 4



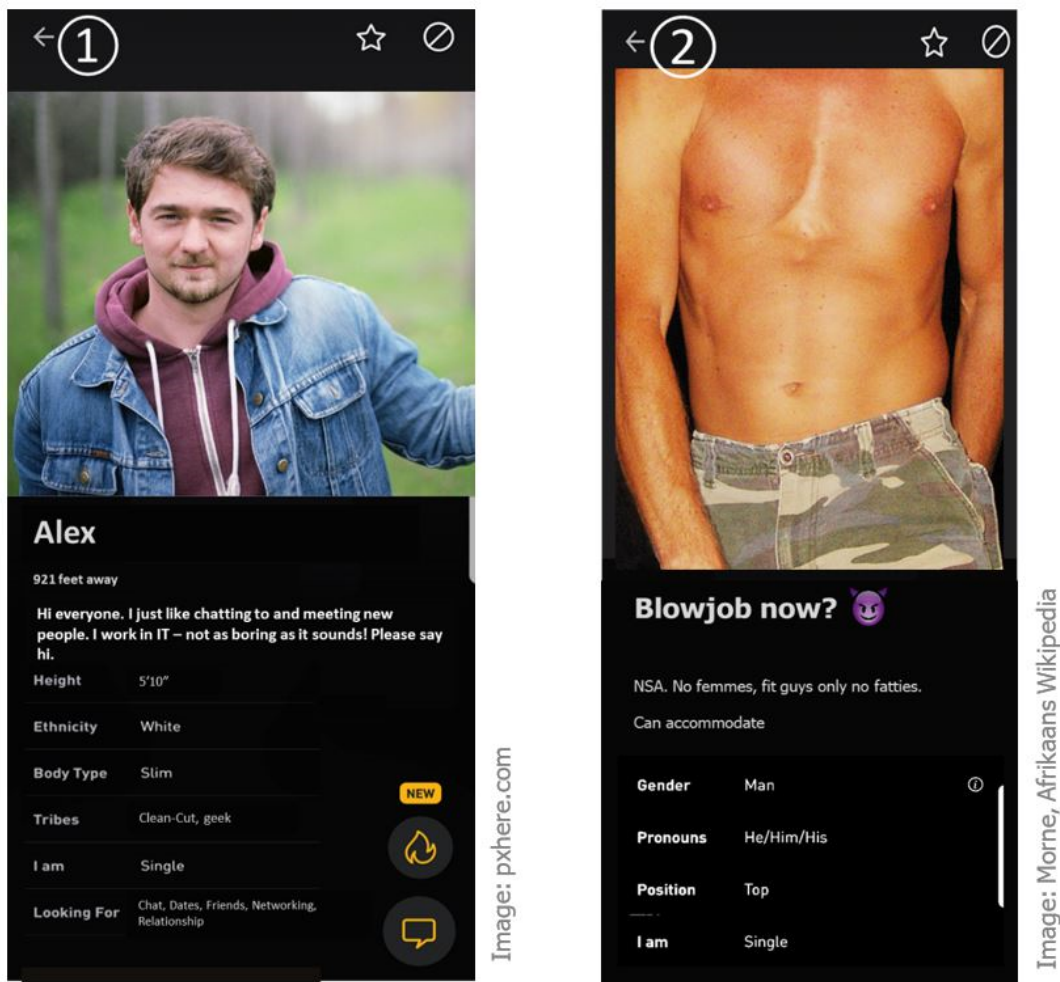
### 6.3.2.4 Men's mock profiles

The men's profiles (figure 6.3 and 6.4) show a range of typical profiles on Grindr. Grindr users are not required to have a photo or age, and all fields are optional. The username can be their first name, a word or phrase (including emojis). The profiles of men were more sexually explicit and reflect the more sexual nature of Grindr. Grindr profiles include acronyms, which were also discussed. The men's mock profiles were:

**1. Alex.** This profile was intended to be an introductory neutral start to the discussion. The approachable, non-sexual photo and text reflects a profile of someone who is using Grindr for dating and relationships, rather than sex. The UK version of this profile was the same except distance away was in metres.

**2. Blowjob now? (devil emoji)** This aimed to be a brief but sexualised profile. The headless torso is anonymous and possibly a fake photo. There is little information and text is very short and judgmental/demanding. NSA is an acronym for "no strings attached".

Figure 6.3: Men's mock profiles 1 and 2

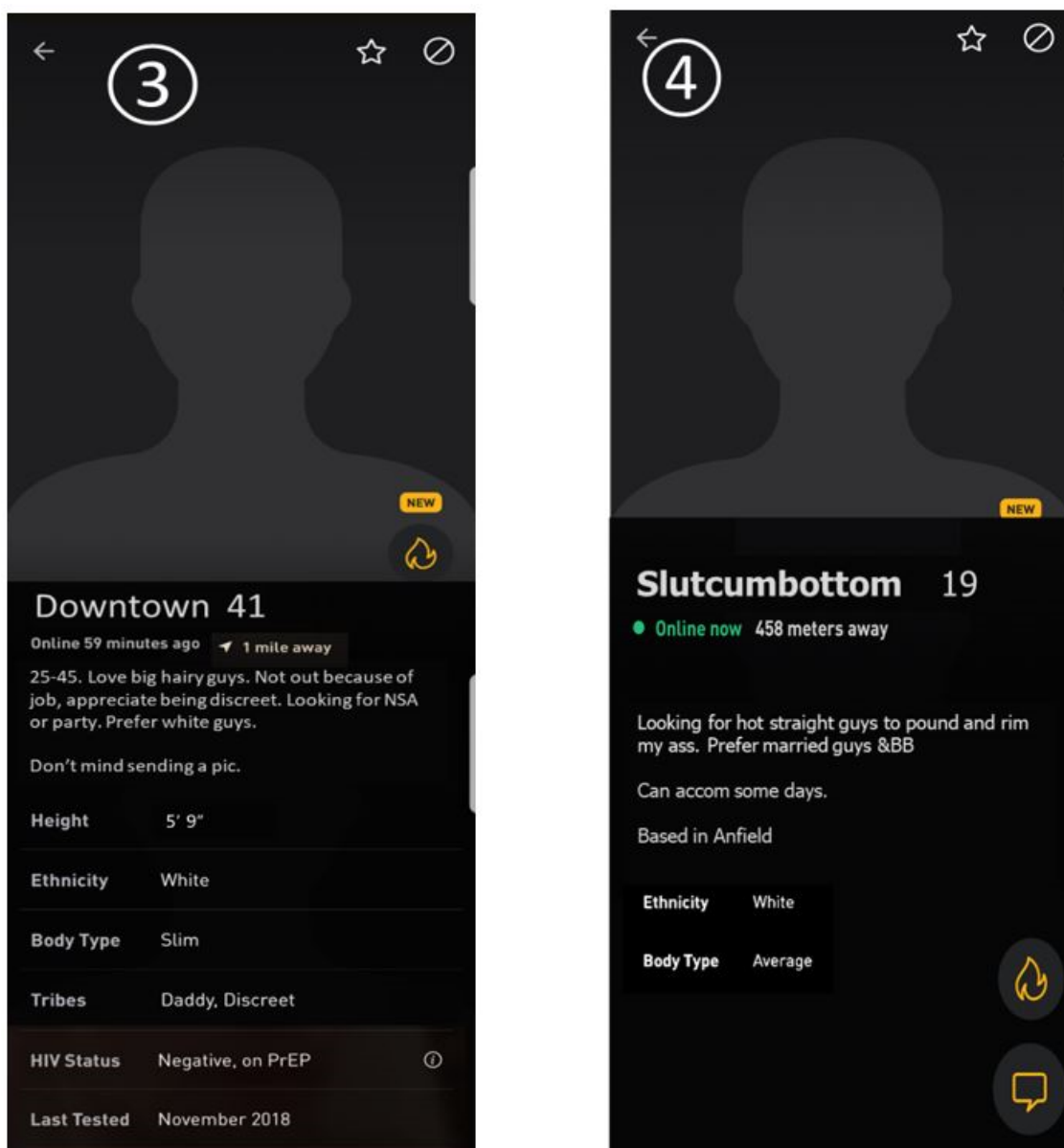




**3. Downtown** aged 41. This profile was designed to be faceless and anonymous, however it includes an information explaining their job means they have to be discreet (potentially prompting discussion of being in the closet). It included reference to “party” (code for chemsex), HIV and PrEP. The statement “prefer white guys” was included to prompt a discussion of race/ethnicity. UK version listed height in centimetres.

**4. Slutcumbottom**, aged 19. This profile was very similar to an actual Grindr profile in Liverpool, with the wording and location changed slightly. It was included as it is highly sexualised and shows sexual risk-taking behaviour. This profile was designed to prompt discussion on; his young age, reference to liking married men, anonymity of the profile and bareback sex (BB). A deprived area of Liverpool was given as his home. The USA version had distance away in feet and stated he lived in Fair Haven.

Figure 6.4: Men’s mock profiles 3 and 4



### 6.3.2.5 Questions about the mock profiles

The mock-profiles were presented one at a time, in order, and discussed in detail before the next profile was shown. At the start of this section of the interview, the participants were told the profiles were fake, but based on real profiles with stock images. The participants were asked *"I am interested in how people respond to these profiles, anything you like the look of or any red flags?"* The first profile was then presented with the question *"Does Becca/Alex appeal? Would you message them?"* Follow up questions and prompts then led on from the conversation. Any participants who did not bring up some of the key issues (such as PrEP or the faceless profiles) were asked if they had an opinion on these elements.

## 6.4 Piloting

Piloting is essentially trying out or pre-testing the data collection tools and interview procedure; checking the tools shows if they are inappropriate or overly complicated and ensures any problems can be rectified before full data collection starts (van Teijlingen and Hundley, 2002). Piloting also ensures the researcher is familiar and confident with how the interviews will run (Tolley et al., 2016). Including pilot data in final quantitative analysis is usually not appropriate as tools change and data might be flawed or inaccurate. However, as it is standard for qualitative interviews to develop and improve with each interview, therefore it is acceptable to include pilot interviews in final analysis (van Teijlingen and Hundley, 2002). However, if the discussion guide or interview tools changed substantially it would not be appropriate.

Two pilot interviews were conducted, one using the men's mock profiles and one with the women's mock profiles. The initial interview with a man in Merseyside tested the interview guide and the order of presenting the mock profiles; presenting the profiles in a slightly different order (1 & 3 together, then 2 & 4). Presenting two at a time made the conversation confusing as it was awkward to make it clear which profile was being discussed. The order was also changed so that the more "mild" and less controversial profiles were presented at the start, and the highly sexualised, potentially "risky" profiles later; once the participant has seen the sexualised profile they had little to say about the milder profile. After the pilot of the interview using the women's mock profile only one change was made; the picture on women's profile 1 was changed to make them a more neutral, appealing and conventionally attractive women who most participants might find attractive. No changes were needed on the semi-structured discussion guide or any of the consent processes. Data from both pilot interviews were included in the final analysis.

## 6.5 Ensuring quality and rigour

Qualitative research acknowledges the researcher is part of the social world – as co-creator and co-participant – and the research aims to uncover the socially constructed meanings and experiences of the participants (McLean et al., 2020). Tolley et al (2016) argue that we only perceive parts of the world and, as researchers, we must be open to many ways of interpreting society. Our access to these multiple worldviews is through the subjective experiences and understandings of participants and researchers should be reflective partners in collecting and interpreting this information (Tolley et al., 2016). Although qualitative research may be subjective and interpretivist, techniques are used to ensure rigour, legitimacy and quality (Braun and Clarke, 2013; McLean et al., 2020). Building on Guba and Lincoln (1994), both Tolley et al. (2016) and McLean et al. (2020) suggest

qualitative research in public health should take account of four dimensions; credibility, dependability, confirmability and transferability

**Credibility.** Similar to internal validity in quantitative research, credibility focuses on confidence in the truth of the findings, with attention to the context and all relevant voices (Tolley et al., 2016). Credible research has been designed and carried out with honour, transparency and legitimacy, and is of appropriate design to answer the research question (Bloomberg and Volpe, 2012; Mclean et al., 2020).

**Dependability.** The equivalent of reliability, dependability relates to the accuracy and stability of the findings over time. This is not always possible in qualitative research as reality can change. However, qualitative research with good dependability will produce similar results and the researcher must be able to demonstrate their consistency across data collection and analysis (Golafshani, 2003; Bloomberg and Volpe, 2012; Tolley et al., 2016; Mclean et al., 2020).

**Confirmability.** Although objectivity is important in quantitative research, maintaining distance from participants would be counter-productive in qualitative data collection. Instead confirmability aims to maintain a distinction between the personal values of the researcher and the participants (Tolley et al., 2016). Anecdotalism and prejudice are avoided and researchers reflect on how their assumptions and biases might influence data collection and interpretation (Tolley et al., 2016; Mclean et al., 2020)

**Transferability.** Similar to external validity or generalisability in quantitative research, however qualitative research rarely aims to produce findings that are generalisable to whole population. Within qualitative research generalisability relates to whether the conclusions of the study are transferable to other similar contexts (Mclean et al., 2020), and whether this is clear to the reader (Bloomberg and Volpe, 2012). Tolley et al. (2016) argue that, although no qualitative research claims to be fully generalisable, the key issues and lessons learned are generalisable if the sample has been carefully chosen to represent a variety of experiences and viewpoints

Finally, Golafshani (2003) suggests that triangulation and combining methods is a vital way to improve the reliability and validity of qualitative research. The mixed methods design can add to the trustworthiness of the study.

It has been argued that by applying quality criteria to their research, a qualitative researcher is accepting the idea they are seeking one “universal truth”, which goes against much of the foundation of interpretivist paradigms (Bloomberg and Volpe, 2012; Bowling, 2014). However, as a pragmatist and applied researcher it is vital that rigour is demonstrated in this thesis and discussing these does not undermine the idea that all participants have different experiences of reality (Braun and Clarke, 2013).

*Table 6.1: Strategies to ensure quality and rigour in study 2 (developed from Bloomberg and Volpe, 2012; Mclean et al., 2020)*

Dimension	Strategies and evidence
<b>Credibility</b>	<u>Reflexivity.</u> A research diary and field notes were kept throughout the data collection and analysis. These were reviewed and developed into the self-reflection boxes throughout the methods and results chapters. My bias and experience were discussed in the researcher position section (1.7).
	<u>Data analysis and write up.</u> The data analysis was discussed with supervisors three times; 1. The codes were discussed halfway through coding the transcripts 2. After all coding we discussed how codes were grouped into initial themes 3. Themes they were reorganised and amended slightly and discussed again (see section 6.7.2) The write-up acknowledges when there were contradictions and discrepancies in the data and highlights experiences that go against the themes.
<b>Dependability</b>	<u>Standardised interview tools.</u> The semi-structured interview guide and mock profiles provided a flexible but consistent data collection tool. All were discussed with the lead supervisor, experienced in qualitative research. The interview tools were tested during the first interview with a man and first interview with a woman. At the end of each interview we discussed how they had found the interview and any suggestions. The man suggested I present the mock-profiles one at a time, as doing all together had been overwhelming. The woman suggested I change the wording and photo on one of the mock-profiles to prompt further discussion. These interviews are included in the thematic analysis as only small changes were made.
	<u>Audit trail.</u> The methods section provides a very detailed explanation of recruitment, data collection process and analysis which would allow replication of the study. The codes, sub-themes and themes developed during the inductive thematic analysis are presented in appendix I.
<b>Confirmability</b>	<u>Sampling.</u> The selection of participants was purposive but did not “cherry pick”. Indeed, two participants who asked to be interviewed were not who I had originally envisaged including in this research; Dee used GSN apps to find women for sexual experiences with her and her long-time male partner, and Zoe was asexual and looking for a female companion. Their inclusion demonstrates flexibility in my position.
	<u>Reflexivity.</u> I was very aware of my less formal role within the interviews and how I was more talkative and jokey than in other research interviews I have done. The role of the researcher as insider versus interrogator and how bias was reduced was reflected on and is discussed in reflection box 6.1.
<b>Transferability</b>	<u>Context.</u> The context of the research is explained in detail throughout this thesis. I have been very involved in the LGBTQ+ community in Merseyside for 15 years so understand the context here. My time in Connecticut was much briefer. However, on my third day in Connecticut I volunteered at New Haven Pride and over the three months discussed the research and local context with as many different LGBTQ+ people as possible, including; LGBTQ+ colleagues and friends, leaders of LGBTQ+ and HIV charities, those who facilitated LGBTQ+ student groups, drag queens, gay media producers and queer researchers. All this helped me understand the local area and what elements of the research are more generalisable and what is specific to New Haven and CT.
	<u>Rich descriptions.</u> The thick descriptions in the results section are provided to enable the reader to understand context and what might be relevant in other contexts. There is a very detailed description of the sample and participants. I acknowledge the sample mainly consisted of confident and “out” people, a lot of whom were academics or students, so might not be transferrable to all contexts.

### Reflection box 6.1: Personal interview style

My interview technique had a less formal and objective style than any research I had conducted previously. The topic of these interviews needed the participants to feel like they were talking to an insider. I made a point of “outing” myself very early in each interview, to ensure the participants knew they were talking to a member of the LGBTQ+ community. I didn’t want them to feel the “subjects of research” and aimed to establish myself as a partner not an interrogator (Tolley et al., 2016).

I used examples from my own experience and that of my queer social circle to indicate I understood and genuinely empathised with the participant’s experiences of GSN apps. Previous qualitative research with British Grindr users acknowledged the importance of communicating that the researcher has experience of using LGBTQ+ apps, placing them as an insider (Bonner-Thompson, 2017). I also used a lot of humour during the interviews and I believe many participants left feeling they’d had an entertaining chat rather than a formal interview. These techniques encouraged the interviewees to open up and led to richer and more frank conversations. Creating rapport in a short time is important – interviewees must feel safe enough to talk freely about their experiences and feelings (Ryen, 2001).

The mock-up profiles introduced towards the end of the interview generated quite a lot of laughter, especially the more sexually explicit men’s profiles and the picture of the woman with a cat. Although amusing, most participants agreed the profiles were realistic. At the end of the interviews, quite a few participants told me they’d enjoyed the interview and said they were going to suggest their friends contact me to take part as well.

I estimate I have conducted at least 75 interviews and focus groups in my research career, and know how to stay neutral and quiet whilst encouraging rapport. But usually I am interviewing on topics about which I have little relevant to say (e.g. talking to teenagers about a sex education, service evaluations, needs assessments, mental health support, HIV, children’s homes etc). However, in these interviews I spoke more than I ever have, but I never led the conversation and ensured any experiences I shared echoed what the participant had said and were given as examples to show my understanding. When you are a research partner not interrogator (Tolley et al., 2016) it is even more important to ensure your own experiences don’t influence the participants’ opinions or introduce bias.

Although my sharing of experiences and the jokes with participants encouraged rapport it took a long time to transcribe and code because there was a reasonable amount of my voice. In hindsight, I would try and reduce the amount I said whilst still building the rapport. There is also a chance it introduced bias, though I was careful to not lead the participantss opinions or put words in their mouths.

## 6.6 Sampling & recruitment

The initial plan was to purposively sample four groups; women in MS, women in CT, men in MS and men in CT. However, the preliminary survey analysis revealed that a large proportion of participants, especially in CT (11%), identified as a gender other than man or woman. Therefore, recruitment was aimed at anyone who “used apps to meet same-gender partners” and participants were free to decide if this applied to themselves. One participant in CT and one in MS identified as non-binary. Due to the small number of non-binary participants they will be included in general analysis, but it is not possible to draw conclusions about specific non-binary experience.

### 6.6.1 Sampling approach

Sampling for qualitative research should be systematic but flexible, and the researcher can select cases or participants who typify or shed light on the object of study (Tolley et al., 2016). Purposive sampling uses strategic decisions about who to involve in the research and is tied in with research objectives; the researcher selects participants who can provide rich data and is particularly useful when aiming to understand why groups may feel particular ways and how these attitudes are constructed (Given, 2008; Tolley et al., 2016). Purposive sampling is not the same as convenience sampling, which recruits participants who are easy to access and willing to take part and can weaken the quality of the data (Tolley et al., 2016).

This study used multiple recruitment methods within a purposive sampling framework. This approach is justified when the researcher assumes, based on their a-priori theoretical understanding of the topic, that certain groups of people may have different or important perspectives on the topic (Robinson, 2014). In this case understanding varying experiences by gender and area is fundamental to the research question. Under the overarching approach of purposive sampling, recruiting a specific proportion of participants based on area of residence and gender could also be called “criterion sampling” or “stratified sampling” (Given, 2008; Robinson, 2014; Flick, 2018). Thus, inclusion criteria were aged 18 or over, has used a GSN app in the last 18 months to find a same-gender relationship or sexual partner, resident in Merseyside or Connecticut and able to give consent.

This study also used some snowballing to increase recruitment. Snowballing sampling is particularly useful when the population might be unlikely to respond to adverts due to the stigmatising nature of the topic, such as sex, HIV or drug use (Robinson, 2014). The main drawback of snowball sampling is that it can result in a biased sample as all participants are linked to the original respondents (Given, 2008; Mclean et al., 2020) However, snowballing was used here as part of a wider recruitment strategy and much of the snowballing was done on social media so reached a more diverse group of people.

At the end of the interview, participants were asked if they would like to pass on the recruitment materials to any friends who might meet the criteria, including by sharing on social media. A few participants asked unprompted, mid-interview if the study was still recruiting as they thought their friends would like to take part. Before she took part in an interview, one participant in CT shared the recruitment advert on the mailing list of her university’s LGBTQ+ staff/student group; approximately six CT interviews came from this mailing list. One MS participant shared the recruitment information with an LGBTQ+ youth group she knew and three interviews were conducted as a result of this.

Smaller sample sizes are common in qualitative research; data quality and reaching saturation is more important than setting specific sample sizes (Beitin, 2012; Bowling, 2014). At the outset this research was aiming for approximately 15-18 participants in each area, with an even gender split. Saturation was reached at 17 participants in CT (8 men, 8 women, 1 non-binary participant) and 16 participants in MS (8M, 7W, 1NB). Saturation is the point at which no new data emerge from interviews and no new categories can be generated (Corbin, 2008). Data was saturated for men after 16 participants and for women at 15 participants; however only two non-binary participants were recruited, which provided only limited data. Gender diverse participants

were not the primary focus of this research, are particularly hard to recruit and potentially have very different issues to cis men and women; therefore, it was not an issue to stop recruitment at only two participants.

## **6.6.2 Recruitment methods**

Four methods were used to recruit participants for interviews; all using purposive sampling.

### **6.6.2.1 Survey respondents**

Participants who completed the online survey (study one) were asked to provide their email address if they wished to be contacted about this qualitative phase. All potential participants were sent two emails, one in September 2018 and one in January 2019. The email provided some more information about the qualitative research and the participant information sheet; both emails were sent BCC to ensure confidentiality.

Thirty-three survey respondents provided an email address and agreed to be contacted about the interviews; 16% of survey respondents. Although three respondents replied to the emails an interview could only be arranged with one participant.

### **6.6.2.2 Facebook page**

The recruitment adverts were shared on the study Facebook page which was set up for the first phase of this research (see appendix B). The post asked people to message the Facebook study page or email the researcher if they wanted more information. These posts were shown to people who liked or followed the study page – the Facebook page was followed by 85 people (as of 25/09/19). No participants contacted the researcher because of a post on the study's Facebook page.

### **6.6.2.3 Podcast**

During the first data collection trip to CT in autumn 2018 the researcher appeared as a guest on a weekly Connecticut based LGBTQ+ podcast called "GayTalk 2.0. The Ultimate Podcast" (GayTalk 2.0, 2018). The researcher was interviewed for 20 minutes about the aims of the research, LGBTQ+ health research generally and how to volunteer for an interview. The three hosts of the podcast also discussed the importance of including women in research about LGBTQ+ sexual health and the current political context for LGBTQ+ people in CT. The research was also promoted on the podcast's Facebook page. Three interviews were conducted as a result of the podcast appearance; one person who heard about the research through the podcast and two who were referred by this interviewee (snowballing).

### **6.6.2.4 Social media and snowballing**

Similar to the second phase of recruitment for the online survey, the study adverts were shared on social media by a variety of LGBTQ+ organisations in Merseyside and Connecticut (using the same list as study one; see appendix D). A recruitment advert was designed to include all the information within the picture.

Organisations were asked to share the information on their Facebook page, Instagram, website or newsletters, although most shared only to their Facebook pages/groups. This information was brief and visual because of the constraints of social media (figure 6.5). Those who saw the adverts on social media were directed to the Facebook study page and email address. Any potential participants who contacted the researcher were sent an information email and a copy of the PIS (see appendix G).



Figure 6.5: Social media recruitment ad (UK version)



**RESEARCHING HOW LGBTQ+ PEOPLE USE SMARTPHONE DATING & HOOK-UP APPS. COMPARING THE UK & USA**

We are doing 1 hour interviews in Merseyside, March - June 2019.  
All participants will be anonymous & all data confidential.

£10 Amazon voucher to say thank you for your time.

Contact Hannah for more info:  
 f fb.me/datingappresearch  
 ✉ h.c.madden@ljmu.ac.uk

Research conducted by: Hannah Madden,  
 PhD Student at Institute of Public Health, Liverpool John Moores University (UK) and  
 Public Health Department, Southern Connecticut State University (USA)

**DATING APP RESEARCH**

*We are recruiting...*

Do you use smartphone apps to meet same-gender partners?

Do you live in Merseyside?

Are you aged 18 or over?

## 6.7 Data analysis

### 6.7.1 Analysis software

Data were transcribed verbatim and imported into NVivo 12 Pro (released 2018, QSR International). NVivo is particularly useful for inductive research as it allows text to be tagged as more than one code, codes can be linked and memos used to record thoughts and ideas about the texts (Bowling, 2014). The case classification facility of NVivo was used to label all interviews on 3 characteristics (see table 6.2). This facility allowed all codes and themes to be compared and contrasted in the characteristics, for example compare the coded text from men and the coded text from women on each theme.

Table 6.2: Case classifications used for NVivo analysis

Classification	Options
Area of residence	Merseyside Connecticut
Gender	Woman Man Non-binary
Sexual orientation	Gay/lesbian Plurisexual Asexual

### 6.7.2 Thematic analysis

The aim of thematic analysis (TA) is not to just summarise the data content but to identify any interesting features of the data, guided by the research question (Clarke and Braun, 2017) and aligns well with the generic qualitative approach (Kahlke, 2014; Percy et al., 2015). Braun and Clarke's TA is inductive, it is data-driven and focuses on identifying the main themes and how these are repeated across and within transcripts (Braun and Clarke, 2006). Inductive TA aims to generate analysis from the bottom up (starting with the data); it is not shaped by existing theory, however the researcher's standpoint, disciplinary knowledge and epistemology must be acknowledged (Braun and Clarke, 2013). Inductive approaches are particularly useful when exploring new fields (Clarke and Braun, 2017; Mclean et al., 2020), such as app use by women.

The TA method developed by Braun and Clarke is atheoretical and unique because it offers a tool for analysis rather than a methodology confined by a theoretic framework (Clarke and Braun, 2017; Braun and Clarke, 2019). TA does not provide a method of data collection or epistemological and ontological frameworks (Braun and Clarke, 2013); therefore, it may be particularly useful for pragmatic research. Qualitative data rarely "speaks for itself" and is shaped by the researcher's ability to connect the data, theory and context (Mclean et al., 2020). Indeed Braun and Clarke (2014) argue that TA offers the researcher the freedom to look at the data and make their own interpretations of patterns and codes.

TA is sometimes criticised as researchers rarely report detail on the process of their analysis or the mechanics of how they developed the themes (Mclean et al., 2020). The Braun and Clarke TA method was chosen as their systematic six step process provides a detailed explanation of how the themes were developed and finalised (see below), ensuring transparency about how conclusions have been drawn (Mclean et al., 2020). There is also a strong precedent as their approach to TA has been used effectively in many studies focusing on similar topics to this thesis. Indeed, much of Braun and Clarke's own research, and the examples in their TA guides, focuses on sexual health, LGBTQ+ communities, homophobia and heterosexism (Braun, 2000; Braun and Clarke, 2006; Huxley et al., 2011; Adams et al., 2014). The Braun and Clarke approach to thematic analysis involves six steps; familiarisation, coding, generating initial themes, reviewing themes, defining and naming themes and writing up (table 6.3).

*Table 6.3: Phases of thematic analysis - adapted from Braun and Clarke (2006) and Braun et al. (2018)*

Phase	Description of the process
<b>1. Familiarising yourself with your data</b>	Transcribing data (if necessary), reading and re-reading the data, noting down initial ideas.
<b>2. Generating initial codes</b>	Coding interesting features of the data in a systematic fashion across the entire data set, collating data relevant to each code.
<b>3. Generating initial themes</b>	Collating codes into potential themes, gathering all data relevant to each potential theme.
<b>4. Reviewing themes</b>	Checking if the themes work in relation to the coded extracts (Level 1) and the entire data set (Level 2), generating a thematic 'map' of the analysis.
<b>5. Defining and naming themes</b>	Ongoing analysis to refine the specifics of each theme, and the overall story the analysis tells, generating clear definitions and names for each theme.
<b>6. Writing up:</b>	The final opportunity for analysis. Selection of vivid, compelling extract examples, final analysis of selected extracts, relating back of the analysis to the research question and literature, producing a scholarly report of the analysis.

### **Step 1 - familiarisation with the data**

All the interviews were transcribed and then re-read to ensure familiarisation with the contents of the interviews. Data immersion enables the researcher to start noticing initial patterns (Tolley et al., 2016) and notes were made on possible codes and general themes. At this stage some codes were set up in Nvivo.

### **Step 2 - generating initial codes**

All the transcripts were coded in Nvivo; sections were coded based on the initial codes generated in the first phase and many more codes created as coding went on. There was no limit on the number of codes created as it is impossible to know what might be interesting later (Braun and Clarke, 2006). Two types of codes were used; semantic and latent. Semantic codes are descriptive, summarise the content the data and stay close to the participants' meaning (Braun and Clarke, 2006; 2012). Examples of semantic codes generated at this stage include "kill time & bored", "paying for apps" and "spambots and fake profiles". Latent codes go beyond the participants' meanings and provide interpretation by identifying meanings beneath the surface of the data (Braun and Clarke, 2006; 2012). Examples of latent codes generated at this stage included "participants judging themselves", "comparisons with heterosexual people/society" and "honesty on apps".

After the initial round of coding the transcripts were then reread and checked to ensure any codes that had been generated later were included on earlier transcripts. In total 140 codes were created. The memo facility of Nvivo was used to record potential links between codes and ideas on possible themes.

### **Step 3 - generating initial themes**

The codes were reviewed to identify areas of similarity or overlap (Braun and Clarke, 2012) and grouped together under initial broad themes. Some of this was done by creating sub-themes in Nvivo during initial coding (for example, from the start "drugs" had four sub-themes: "alcohol", "cannabis", "chemsex" and "other drugs"). However, the majority of codes were grouped and themes generated after coding had finished. Due to the large number of codes, only those salient to the research objectives were included in the themes, some of the less relevant codes discussed by only a small number of participants were disregarded. The themes went through a couple of iterations before being finalised in the next stage. The themes were data driven and although linked to the research objectives were not led by these. Initial themes were discussed in a meeting with four supervisors. Supervisors offered some suggestions to add clarity to the way the themes were split, for example ensuring the themes clearly differentiated between intentions and outcomes (e.g "looking for sex" vs "sex as a positive outcome"). Initially six themes were generated (one of these was later merged with other themes and another theme was later added; see step 4 and reflection box 6.2)

### **Step 4 - reviewing themes**

In this phase, themes are refined and can be split, combined, or discarded (Braun et al., 2018). Themes should incorporate data from the whole interviews not only responses to specific questions (Braun and Clarke, 2012); care was taken to ensure themes did not just reflect what had been asked. Another theme was added after discussion with a supervisor; the way people used apps (patterns of app use) was originally discussed at the start of the chapter to provide context. However, after consideration it became clear this should be an actual theme as the key topics revealed a lot about health behaviour and experience of apps. At this stage one theme

was also removed (*being honest but not being rude*) as it had crossover with other themes, was vague and it was not easy to explain the central organising concept of this theme. Therefore, the two sub-themes (rudeness and honesty) were moved to theme 3 (negatives) and theme 5 (strategies).

### Step 5 - defining and naming themes

The Braun and Clarke approach to thematic analysis recommends using a central organising concept for each theme; that is an idea that captures and summarises the core point of each theme and shows meaning and pattern in the data (Braun et al., 2018). During this stage each theme was examined in detail to establish the scope and focus and to determine the "story". The name of each theme and sub-theme were also decided at this stage to ensure the names were informative, concise and fully captured the meaning of that theme (Braun and Clarke, 2012). The themes were also reviewed to ensure there was no overlap. Although there was a lot of crossover in motivations for use and outcomes of use (eg, sex, love, friendship etc) it was important that these were kept separate as they are different components of health behavioural theories.

### Step 6 - writing up

During the writing up phase the analytic narrative and data were woven together and presented with illustrative quotes (Braun et al., 2018). It is important to present the themes in a logical order, to tell a story where each theme builds on the previous theme (Braun and Clarke, 2012). The themes were ordered and presented in the order given to tell the story of how people use apps, what influences this behaviour, how they view benefits and negative impacts, what strategies they use to stay happy and healthy and then finally how sexual health is linked to app use. The findings of the interviews (chapter 7) separates the results and the discussion into two separate sections rather than weaving them together as is sometimes the practice with TA (Braun and Clarke, 2006). This enables the synthesis and triangulation (chapter 8) to bring together the full results and literature at the end as is appropriate for mixed methods research.

### Reflection box 6.2: Inductive analysis

Inductive coding originally generated 140 codes, however, approximately a fifth of these were not included in the findings because they were not salient to the research objectives or were discussed by so few participants; e.g. "group sex" (discussed briefly by only three men), "apps encourage promiscuity" (three participants) and "how long before they have sex with app partner" (three participants). There were some exceptions as some themes were mentioned by only a few people but still included in the findings, because they were important to the objectives.. For example, "dental dams" were only mentioned by four women but this lack of discussion is relevant to harm reduction. Similarly, although only five people mentioned non-volitional sex, these were important experiences that had an impact on participants.

The inductive thematic analysis took a considerable amount of time, over 140 codes on 33 interviews was a long, laborious process. Although the key themes were developed through inductive analysis, allowing the data to determine the themes, five out of the six themes actually aligned with the phrasing of the research objectives. To be honest this was frustrating as the process of grouping codes, refining, themes and grouping into themes was very time consuming - if I had done a quicker form of qualitative analysis (e.g. Framework Analysis; Ritchie and Spencer, 1994)) I would probably have started with the research objectives as the main themes anyway. However, this thorough inductive thematic analysis (Braun and Clarke, 2014) added rigour and trustworthiness to the findings.

## Chapter Seven | Interview Findings and Discussion (Study 2)

This chapter presents the findings from the 33 interviews with GSN app users in CT and MS. The information about the participants is presented first, then six key themes, generated through thematic analysis (Braun and Clarke, 2014; Braun et al., 2018). The final section of this chapter links the findings to previous research and discusses the public health implications and limitations.

### 7.2 Participants

Throughout this results section, the identity and gender terms used by the participants themselves will be used. For example, some participants identified as bisexual and said they used apps to meet men and women, whereas others talked in less binary terms, identifying as pansexual and said they used apps to meet people of any genders. As there were only two participants who identified as non-binary, where appropriate, they are presented alongside the group based on who they use apps to meet. Robin, the non-binary participant who used Grindr to meet men is sometimes grouped with the men who used Grindr or other MSM apps. The other non-binary participant, Bailey, used the pronouns they/them or she/her, used Tinder and OKCupid to meet men and women, and is sometimes grouped with the women. Illustrative quotes are presented in *blue* for Merseyside (MS) participants and *purple* for those from Connecticut (CT) and numbers of participants discussing each issue are presented in brackets with gender (e.g. 2W/1M/1NB means topic discussed by two women, one man and one non-binary participant).

Table 7.1 and table 7.2 show the demographics of the interview participants (separated into CT and MS). To ensure participant's anonymity, ethnicity and route of recruitment are not presented, however they are discussed here. Sixteen interviews were conducted in Merseyside and 17 in Connecticut. The median age of participants was 26 years (range = 19-54). The sample of women was older (CT Mdn=30.5, MS Mdn= 28) than the men (CT Mdn=26, MS Mdn=23.5). Over half of the participants in Merseyside were students (9/16; 56%), although most of these were mature students or postgraduate students. Less than a third (5/17, 29%) of CT participants were students, however, over a third of CT participants worked for a university (education/research). Most of the students in both areas also had part-time jobs. Three participants were professionals working in health-related fields and two MS participants were unemployed. Approximately a third of participants in both areas were old enough to have been dating before the invention of GSN apps.

The majority of participants were white British or white American. Five of the CT and three of the MS participants identified as an ethnicity other than white American/British. Just over half (55%) of participants learnt about the research through an advert on social media and two fifths (39%) found out about the study from another participant (snowballing).

## 7.2.1 Participant demographics

*Table 7.1: Interview participant demographics, Merseyside*

<b>Pseudonym</b>	<b>Gender</b>	<b>Age</b>	<b>Relationship status</b>	<b>Sexual orientation (as stated by participant)</b>	<b>Using/used apps to meet:</b>	<b>Dating before apps</b>	<b>Occupation</b>	<b>Approx. time using apps to meet same- gender partners</b>
<b>Robin</b>	Non-binary	19	Single	No term	Men	No	Unemployed	1 year
<b>Steve</b>	Man	26	Single	Gay	Men	No	Student	5 years
<b>Aurelio</b>	Man	30	Single	Gay	Men	No	Professional/IT	10 months
<b>Lollipop</b>	Man	20	Single	Bisexual/pansexual	Men & women	No	Student	3 years
<b>Bernard</b>	Man	30	Single	Gay	Men	No	Customer service	9 years
<b>Yellow</b>	Man	38	Non-monogamous	Gay	Men	Yes	Student	9 years
<b>Luffy</b>	Man	21	Single	Gay	Men	No	Student	1-2 years
<b>Sam</b>	Man	20	Single	Homosexual	Men	No	Student	2 years
<b>Phil</b>	Man	20	Single	Gay	Men	No	Unemployed	2-3 years
<b>Mickey</b>	Woman	29	Single	Lesbian/gay	Women	Yes	Education/research	2 years
<b>Bridget</b>	Woman	33	Single	Bisexual	Men & women	Yes	Hospitality/travel	2 years
<b>Belinda</b>	Woman	33	Single	Queer	Women	Yes	Student	4 years
<b>Savana</b>	Woman	19	Single	Bisexual	Meeting women, talking to men	No	Student/Customer service	6 months
<b>Fitz</b>	Woman	27	Single	Lesbian/queer	Women	Yes	Student	3 years
<b>Natalie</b>	Woman	24	Non-monogamous - met on apps	Lesbian	Women	No	Unemployed	6 years
<b>Courtney</b>	Woman	37	Monogamous - met on apps	Gay	Women	Yes	Education/research	1 year

*Table 7.2: Interview participant demographics, Connecticut*

<b>Pseudonym</b>	<b>Gender</b>	<b>Age</b>	<b>Relationship status</b>	<b>Sexual orientation (as stated by participant)</b>	<b>Using/used apps to meet:</b>	<b>Dating before apps</b>	<b>Occupation</b>	<b>Time using apps to meet same-gender partners</b>
<b>Bailey</b>	Non-binary	26	Single	Queer/pansexual	Any gender	No	Health professional /education/research	3-4 years
<b>Topher</b>	Man	26	Single	Gay	Men	Yes	Student/Hospitality/travel	6 years
<b>Patrick</b>	Man	22	Single	Gay	Men	No	Student	3 years
<b>Jammal</b>	Man	22	Single	Gay	Men	No	Student/Education/research	5 year
<b>Jesse</b>	Man	31	Single	Gay	Men	Yes	Hospitality/travel	9 years
<b>Sebastian</b>	Man	31	Dating someone – met on apps	Gay	Men	No	Health professional	7-8 years
<b>George</b>	Man	26	Single	Queer/gay	Men	No	Education/research	8 year
<b>John</b>	Man	20	Monogamous - met on apps	Gay	Men	No	Student/hospitality/travel	2 years
<b>Peter</b>	Man	29	Dating a few people met on apps	Homosexual	Men	No	Education/research	2-3 years
<b>Akina</b>	Woman	24	Single	Pansexual	Any gender	No	Customer service	1-2 years
<b>Candide</b>	Woman	25	Monogamous - met on apps	Bisexual	Men & women	No	Student/Education /research	8 months
<b>Dee</b>	Woman	25	Non-monogamous relationship	Bisexual	Men & women	No	Education/research	4 years
<b>Soot</b>	Woman	31	Single	A-/demi-/bi-sexual/queer	Any gender	yes	Education/research	2-3 months
<b>Barbara</b>	Woman	54	Monogamous - met on apps	Gay or lesbian	Women	Yes	Health professional	9 months
<b>Alex</b>	Woman	51	Dating someone	Lesbian	Women	Yes	Education/research	3-4 years
<b>Emma</b>	Woman	30	Single	gay/lesbian	Women	yes	Professional/IT	6 years
<b>Zoe</b>	Woman	42	Single	Asexual	Women	Yes	Education/research	6 months



### 7.2.2 Participant identities and “outness”

More women than men identified as plurisexual (either bisexual, pansexual or queer). Fifteen of the sixteen men interviewed identified as gay or homosexual and used apps to meet only men. One man in Merseyside identified as bisexual/pansexual and mainly used apps to meet men and had recently started using apps to meet women. Almost half of the women (7/15) identified as plurisexual and used apps to meet women and men/other genders.

The majority of participants involved in this research were relatively “out”, open and confident about their sexual orientation with family, friends and colleagues. Of the 33, no participants were secretive about their sexual orientation but two (Aurelio and Zoe) were only out to some close family and friends. It was very common for participants to talk about being fully out but acknowledge their extended family (grandparents, aunts etc.) may not know, however, this was more because they were not close and it had not come up in conversation than they were actively hiding it.

For most people being “out and proud” was important to them and participants talked about the significance of this in two main ways. Firstly, for some, being open about their identity was the only way they could be their true selves, and they felt inauthentic if they kept their sexuality or gender identity hidden. Secondly, being out and open about their identity was an intentional or political act to ensure the LGBTQ+ community was visible, thus reducing stigma and being the role models they wish they had had when younger. Some actively strived to ensure they were not misinterpreted as heterosexual or cis-gendered.

*I feel like the people that know and love and respect me, the ones that care about me are clearly okay with the fact that I'm gay. If I had to hide it from everybody then I'd feel like those people [shouldn't be] in my life...it's like I don't want to hide from the people that I love and then I don't want the people that I love to think that I'm hiding from them in some way. (Jesse, gay man, CT)*

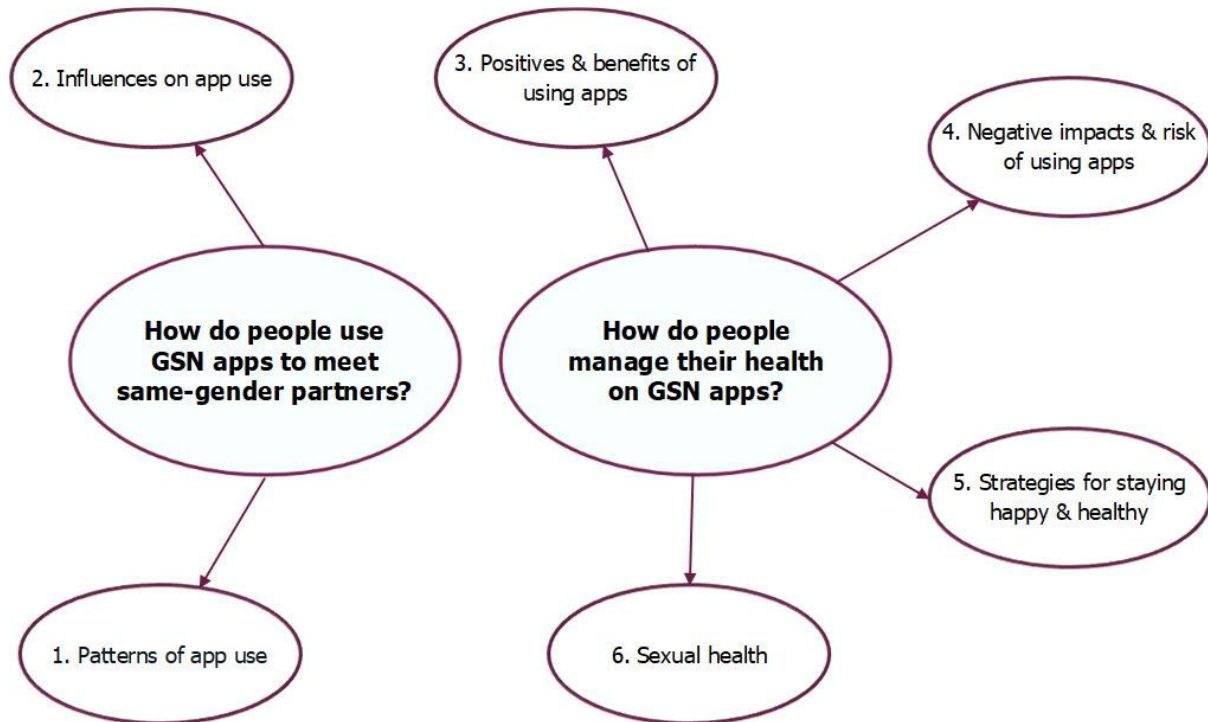
*I am out, 150% out I would say. I'm very out. I'm out at work, at uni, with all of my friends, I don't know anybody that I'm not out with...I guess I think it's really important to be visible...it's important for other people who are struggling...I've never been uncomfortable with my sexuality, erm, I've always been fully supported and I think it's really important for people who perhaps haven't had that experience to see that and to see that, kind of, without any fanfare around it I suppose. (Belinda, queer woman, MS)*

For those that were “less out” they often talked about recent anxiety, stress and difficulties coming to terms with their LGBTQ+ identities and not feeling confident enough to share it yet. Those who were not cis gender (Bailey, Robin and Fitz) were mainly open about their gender identity as well as their sexual orientations.

### 7.3 Key themes from the interviews

Six key themes were developed through inductive, thematic analysis (Braun and Clarke, 2012), these are presented in figure 7.1.

Figure 7.1: Theme map - key themes



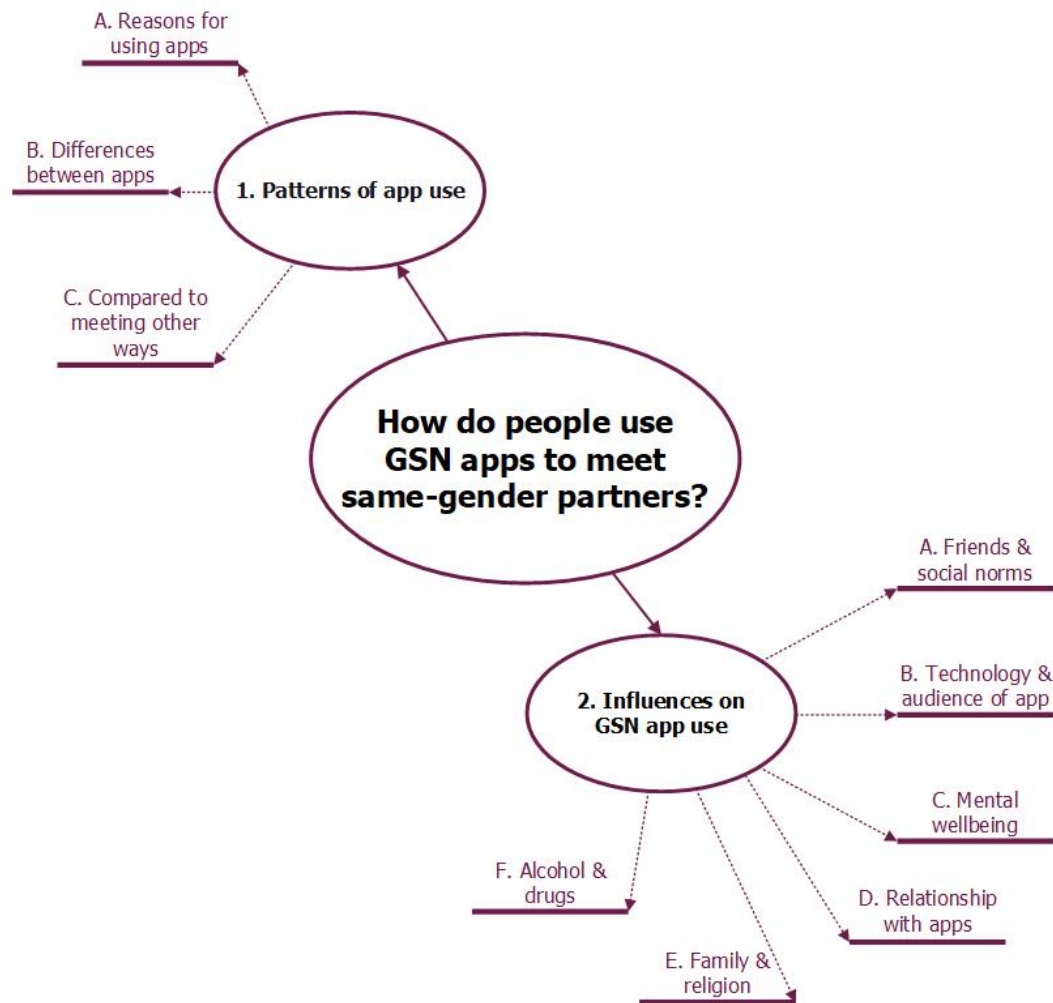
These six themes have been divided in two to answer the main research questions:

- How do people use GSN apps to meet same-gender partners?
- How do people manage their health on GSN apps?

Each key theme had several sub-themes. The sub-themes relating to how people use GSN apps to meet same gender partners are presented in figure 7.2. The sub-themes relating to managing health impacts are presented in figure 7.5 (section 7.3.3).

Within each sub-theme, the case classification system in NVivo was used to compare codes by gender and area; if there were differences in the ways groups talked about an issue these are presented separately, however if both groups showed a similar experience or understanding of a sub-theme they are presented together. Where relevant some sub-themes are also discussed in relation to sexual orientation or age.

Figure 7.2: Theme map - using apps themes, and sub-themes



### 7.3.1 Theme 1: Patterns of GSN app use

All participants were asked which apps they used (see table 7.4 for list) and about their motivations for using apps, the majority also discussed how they viewed the differences between the apps and other ways they would meet potential partners if they could not use apps. Three sub-themes were generated; *reasons for using apps*, *differences between apps*, and *compared to other ways of meeting partners*. There were no differences by area, however, men were more likely to be using apps for sex and there was a clear consensus for men about the aim of specific apps (see theme 1b).

#### 1a Reasons for using apps

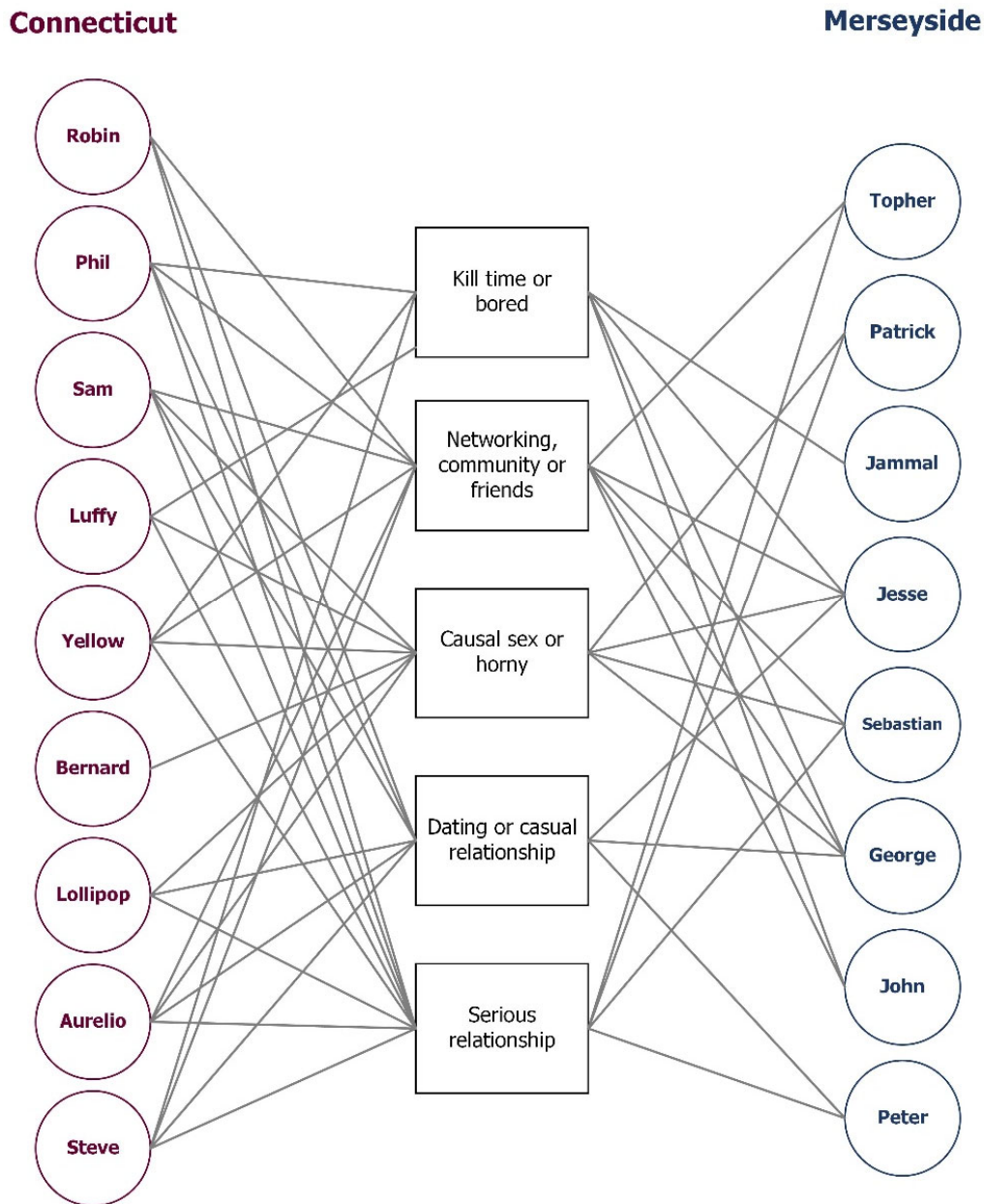
Generally, participants reported they currently used or had used apps for five main reasons: *boredom or to kill time*; *networking, community and to find friends*; for *casual sex or a hook-up*; *dating or non-serious relationships*, and; *looking for long-term or serious relationships*. (see table 7.3 for explanation of each reason).

Table 7.3: Five main reasons for using GSN apps

Reason for using app	Explanation and illustrative quote
<b>Boredom or to kill time</b>	<p>Browsing the apps, looking at photos, exchanging photos, chatting to people online - usually without any intention to meet up with another user</p> <p><i>I wasn't, you know, meeting up with any of them...I would just when I was bored, just scrolling...[but] I would scroll through everything [other social media] else first. (John, gay man, CT)</i></p> <p><i>I'm just busy with a lot of other stuff so I don't tend to even go on much... And if I do I don't tend to message anyone I just browse cos I am bored. (Luffy, gay man, MS)</i></p>
<b>Networking, community and to find friends</b>	<p>Talking to other gay people for non-sexual/romantic reasons, looking for friends, getting to know local gay community, feeling connected to other gay people, finding out about local events</p> <p><i>because being queer is really important to me, I don't feel like I've got enough, I've got a lot of gay friends, I don't feel like I've got enough really queer friends, so people that are living differently, for whatever reasons, and it's definitely opened me up to the potential meeting some of them. (Belinda, queer woman, MS)</i></p> <p><i>I felt that that was a safe space to start coming out...Just chatting. In the beginning, it was more just trying to get into that bubble, if you will, and just to start...cos I really didn't know a lot of, erm, gay or homosexual people. (Sebastian, gay man, CT)</i></p>
<b>Casual sex or a hook-up</b>	<p>One-off, or expected to be one-off, casual sex arranged through the app with both users knowing sex is inevitable and usually without getting to know each other first. Usually meet at the location they plan to have sex or for a quick drink with the knowledge the evening was going to end in sex,</p> <p><i>I know you may think this is bad but like, I get really like horny and like I don't want to commit to something so I use Grindr when I really want to have sex but I don't want to commit. (Patrick, gay man, CT)</i></p> <p><i>[after relationship ended] So I was horny I was like, "get on this" and then that's kind of how it happened...so after the period of licking my wounds and crying and all the usual then I thought "let's go out there get laid" (Courtney, gay woman, MS)</i></p>
<b>Dating or non-serious relationships</b>	<p>Meeting up with people for a drink, date or other social activity with the intention of it being more than friends, sex is possible, and looking for someone to possibly meet/have sex with more than once but not wanting to fall in love or commit to a serious or monogamous relationship</p> <p><i>I don't do the hook-ups..that's why I'm not on Grindr, I don't want...I first want to go for a date with people have a drink or whatever and see what happens. (Peter, gay man, CT)</i></p> <p><i>Right now in my life, now it has moved on, I've gone through the [casual sex] phase. I don't feel that urge to go out and have to have sex. [I want] companionship with sex (Alex, lesbian woman, CT)</i></p>
<b>Long-term or serious relationships</b>	<p>Looking for love, a serious emotional and romantic connection, looking for "the one" or a wife/husband.</p> <p><i>I don't find myself to be very promiscuous...I don't want [hook-ups] I mean I wanna find like a husband. (Topher, gay man, CT)</i></p> <p><i>I always said I was looking for a relationship. I think I am...Yeah I think I am. But I wouldn't mind anything else. I could be happy to have experiences but ultimately I am looking to not be single any more. Cos it fucking sucks. (Fitz, lesbian woman, MS)</i></p>

Very few participants (1M/1W) used apps for only one of these reasons. Figures 7.3 and 7.4 show the participants and various reasons for current or past app use. As can be seen from the complexity of these diagrams there was a lot of crossover, with most participants giving two or three reasons for using apps. Sometimes these reasons were concurrent (e.g. using apps for casual dating but being open to finding a serious relationship through apps) or had changed over time (e.g. had used apps for only hook-ups but now they were looking for dating or serious relationships).

Figure 7.3: Reasons for using GSN apps, past and current – men (n=16) and non-binary Grindr user (n=1)

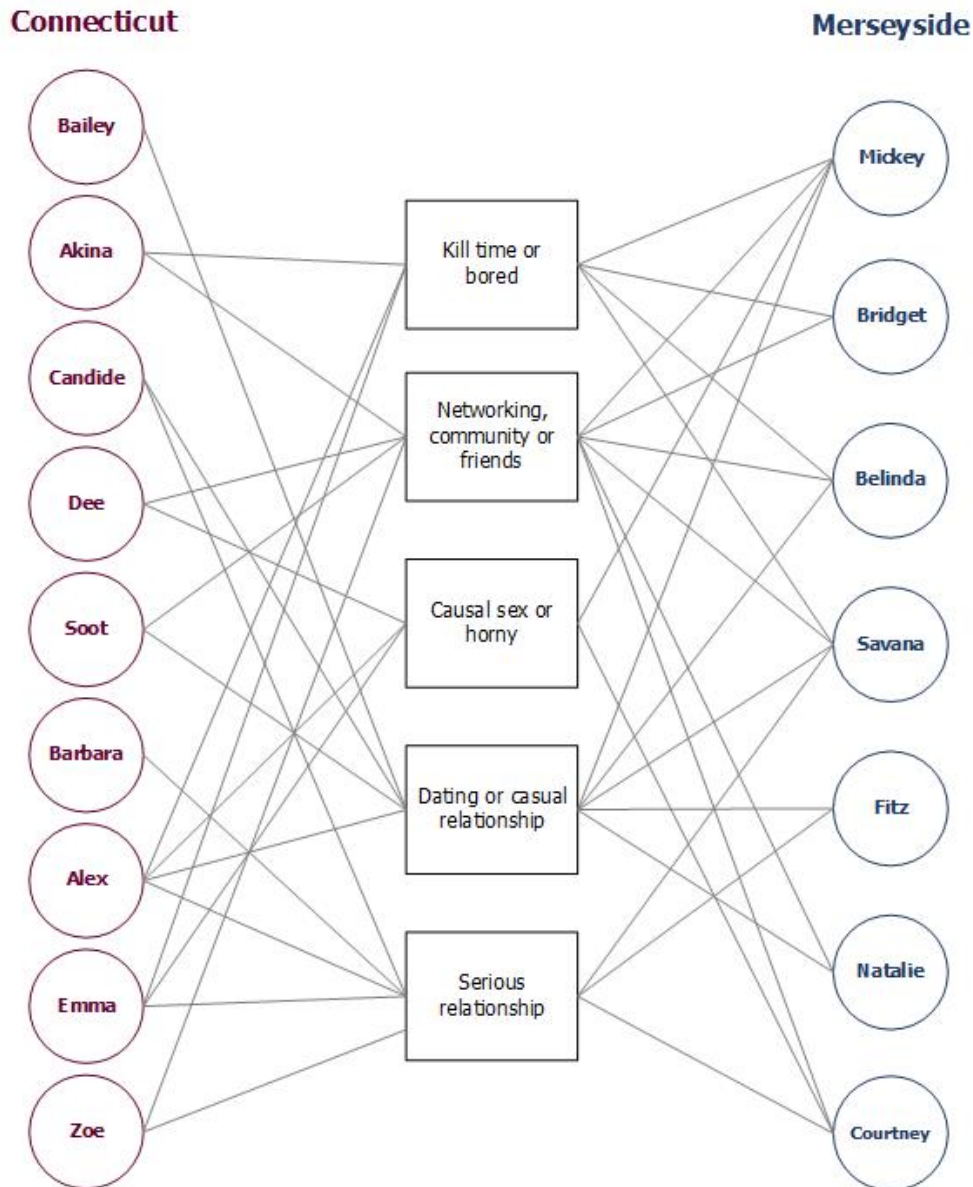


There were some definite crossovers between motivations and many participants struggled to differentiate between hook-ups and casual dating or between looking for dates and looking for serious relationships. Participants also talked about how they had intended to use apps for one reason but ended up using them in other ways, for example eight people (6M/2W) discussed how a casual hook-up or casual date arranged through an app had turned into a serious or long-term relationship.

*We were like "let's not have anything serious". We kept hooking up and hooking up and it developed into something serious and maybe like, three or four months down the line when we weren't just hooking-up we were dating. We had a conversation, she was like "I don't want you to feel like I'm on Tinder" and I was like "I'm not looking for anyone else right now" (Mickey, lesbian women, MS)*



Figure 7.4: Reasons for using GSN apps, past and current – women (n=15) and non-binary participant who dates women (n=1)



*Topher: I don't want [hook-ups] I mean I wanna find like a husband.*  
*Hannah: you're looking for something other than just the multiple hook-ups?*  
*Topher: Yeah yeah absolutely.*  
*Hannah: but it sounds like some hook-ups are happening on the way?*  
*Topher: yeah yeah we are human (Topher, gay man, CT)*

The main difference between genders was that twice as many men (10) than women (5) were currently, or had in the past, used apps for casual sex and hook-ups. When women talked about casual sex it was rarely a one-time hook-up arranged through an app. All five women who discussed using apps to find casual sex with women explained how they would always meet the woman for a drink first, even if there was an expectation of sex; casual sex and casual dating were interchangeable for most women. No women in this study would just

go to a woman's house for sex without attempting to get to know them a bit first, over at least a drink. However, eight men talked about how they have used apps for casual, one-off sex without meeting for a drink or getting to know the other app user first.

*So like I get into swings where I'm definitely more interested in finding someone to share my time with and be with...And then there's also those times when I'm just kind of looking for someone to spend the night with and, and have a quick, easy scenario out of it. Erm, and never talk to them again [laughing] (Sebastian, gay man, CT)*

*I think, I mean, out of my friends, yeah the people that I know, I am probably the most promiscuous, or have been the most promiscuous. I have been the most likely to have kind of one-night stands but it would never, ever have occurred to me to not go for a drink first. At least pretend it's a date. (Belinda, queer woman, MS)*

### 1b Differences between apps

All participants were asked which apps they had ever used and why. Men talked about twice as many men's apps (10 mentioned by name), than the apps mentioned by women (only 5 women-focused apps named; see table 7.4). Most participants had also tried general apps that are not gender or sexual orientation specific. Although 25 apps were mentioned by name, about half of these had only been used by one or two participants, and many of these had been used either a long time ago, or used only briefly. All 33 participants mentioned Tinder at least once in their interview, only three people (1M/2W – all CT) had never even tried Tinder.

Table 7.4: All apps ever used by 33 interview participants<sup>41</sup>

Rough proportion discussing each app	General apps	Apps for MSM	Apps for WSW
<b>A least a third of potential users</b>	Tinder OKCupid Plenty of Fish (PoF)	Grindr Scruff	HER (previously named Dattch)
<b>Less than a third of potential users</b>	Match Bumble Hinge	Hornet Jack'd	
<b>Only one or two users</b>	Asexuality Cupid Coffee meets bagel Happn JSwipe	BoyAhoy Burley Chappie Fabguys Only Lads Surge	Lesly Scissor Wing Ma'am Zoe

There was no consensus from women about the purpose of Tinder. Some thought Tinder was the place to find a date or relationship, others felt Tinder was more focused on casual sex or hook-ups. Many women felt because Tinder was a casual sex app for straight people this was how WSW used it. However, others felt that although Tinder may have started as a casual sex app, because of the sheer number of WSW users it was now also used for dating and serious relationships. Many women compared Tinder to apps like OKCupid and Bumble; Tinder includes briefer profiles and more focus on photos, which they felt, implied it was more sexualised. Most of the

<sup>41</sup> During the interviews a variety of app names were mentioned by participants as being currently or previously used. However, this information was not collected systematically so only general proportions are included in this table, not specific numbers.



plurisexual women agreed that heterosexual men used Tinder for sex and found it “sleazy” and would avoid men on Tinder.

*Men would always typically say that “Tinder was for hook-ups”. Women would also say that but some women would say “no, I use it for dates” or “my friend got a date off of it and has a boyfriend” but...all men said “no, hook-ups”, for sure. (Akina, pan woman, CT)*

*I think Tinder was being marketed...it was like the Grindr for straight people whereas like, OKCupid, is like more serious relationship or Bumble or Hinge. People were looking for something more serious and Tinder like, always kind of positioned itself as like, casual stuff. But because that's where everybody is, queer women use it for serious stuff, just because it's like there's not enough of us to populate these other apps. (Emma, gay/lesbian woman, CT)*

There was a general understanding amongst men that Grindr was more for casual sex and hook-ups. Some men said they look for friends or arrange a date through Grindr, however these were seen as anomalies. Most men discussed how the main aim of Grindr was quick, casual, low-commitment sex. Grindr facilitated sex with people nearby and most people would not expect to meet for a drink or date beforehand. For this reason, some men chose not to use Grindr as they wanted at least a drink and some kind of emotional connection before sex, even a casual hook-up.

*I think Grindr...I mainly just sign on for a hook-up, like a quick little one nighter or maybe something regular if he's like in the area...Cos it's easier with Grindr. Grindr's kinda like a quick get on, get off, get out. (Jesse, gay man, CT)*

*[Grindr is] for hook-ups innit? I always say I'm looking for Mr Right but I know I'm only going to find Mr Right Now. And, see, I also, but then I also use Tinder and that, so in my head Tinder is like, if you wanna date. Grindr if you wanna shag. (Bernard, gay man, MS)*

Ten women currently or had previously used HER (4CT/6MS). There was general agreement across both areas that HER had mainly younger users, and because it only allowed users to upload photos with no space for text, was not necessarily designed for deep connections. However, many women, especially in MS liked HER and said users circumvented the lack of space for profile text but uploading pictures of text to their profile. Some women liked the virtual communities on HER (e.g. international groups focusing on specific sports or art). HER was mainly used in addition to other apps (usually Tinder) as there are fewer users on HER, especially in CT.

*I've downloaded HER for a couple of times, mostly, like kind of checking in to see if anybody else has started using it. [Laughter]. In [my city] the answer is like mostly like 17 year old girls. (Emma, gay/lesbian woman, CT)*

*HER you can only put pictures so there's no text. So if people want to put text they often write in the notes section of their phone, screenshot, and then put it on the photos (Mickey, lesbian woman, MS)*

Ten people (mainly women and the non-binary participant who used apps to meet women) used OkCupid, (3M/6W/1NB). For a minority of women, especially in CT, this was the main app they used. The consensus from all genders was that OKCupid was an app people use to find more serious relationships or to get to know people before arranging a date. The format of OKCupid allows users to have a long, detailed profile, users can answer questionnaires and OKCupid's algorithms suggests percentage matches with other users. OKCupid was also

thought to be very queer friendly as it allowed users to choose many gender and sexuality terms and indicate this on their profiles (e.g. asexual, polyamorous, demiromantic/sexual, sapiosexual – see glossary) A minority of women mentioned they liked that OKCupid had a facility to stop cis men contacting them.

*I put in the energy and effort to build the OkCupid [profile]...You can specify your sexuality, and you can specify five different kinds of confused sexuality. It really appeals to me because I was like "oh I think I might be a little bit of this and a little bit of that" so I can put lots of options. I can choose asexual, I can choose demi. Anything whatever, you can choose poly, sapio and pan whatever you want. There is an option where you flip a button and no cis men can see you. (Soot, pan woman, CT)*

### 1c Meeting on apps compared to meeting in other ways

Over three quarters of participants compared app use to other ways of meeting romantic and sexual partners or suggested alternative ways of meeting potential partners. Without apps the most common suggestion of other ways to meet apps was gay bars and clubs (5M/6W). However, a similar number of participants (6M/5W) explicitly stated they found it very difficult to meet people in bars; either because they did not enjoy loud crowded bars or they had no confidence. Some younger participants struggled to imagine a world without apps though some said they might try to meet partners through college or social groups. Five men felt apps were the only way they met partners and they could not see themselves ever using other ways to meet partners.

*[if apps didn't exist] Um, I feel like I would just have to meet people, in person. Probably meet people going into like the different gay clubs or at school. You know, I would just actually have to go up to someone say hi [laughter] (John, gay man CT)*

*...a lot of this comes down to my lack of confidence...Without the dating apps I would have to go out more to clubs and stuff like that...but I think they are basically a lifeline for me. I'm not the kind of person who likes to just go out. I don't know how to hit on people so I doubt I'd be able to do that either. (Fitz, lesbian woman, MS)*

A third of participants (5M/6W) previously used websites to meet sexual and romantic partners; all but one were over the age of 30. They had used general dating sites, LGBTQ+ specific dating sites and early social media including; OKCupid, Match.com, Gaydar, Gaydar Girls, Plenty of Fish, AOL Instant Messenger, Myspace, Fab Guys, Only Lads and general chatrooms/dating websites. Many of these older participants had simply moved from the technology of desktop or laptop computers to their smartphone and GSN apps. Four participants (3M/1W/1NB) were still using websites and other social media to meet partners, alongside GSN apps.

*But before the apps, like...websites...and before websites there's chat[rooms]...at a very young age I had already been into all those...Moved with the times really. (Yellow, gay man, MS)*

*Well, for years, I was trying different dating sites [to meet] males. I was looking for men. And then I thought would try the asexual ones (Zoe, asexual woman, CT)*

### 7.3.2 Theme 2: Influences on GSN app use

All participants discussed factors that influenced the initiation of app use, behaviour on apps and the ways they met partners. Six sub-themes were generated; *friends and social norms: technology and audience of apps; mental wellbeing; relationship with apps; family and religion*, and; *alcohol and drugs*. There were no differences

between the areas but some differences between genders, specifically in relation to why participants may feel they had an unhealthy relationship with apps, why men and women used apps in a post-break up phase and men's opinion of engaging in chemsex.

## 2a. Friends and social norms

Friends were an important factor that influenced both participants initiating app use and how they use apps. All but four participants (4M) mentioned their friends when discussing their app use. Two thirds of participants, more women, (6M/11W/1NB) were either explicitly encouraged to use apps by their friends or they wanted to try apps after seeing friends use them. Friends' experiences guided choice of which app to initially download (usually Tinder and/or Grindr) and some participants who had been in long-term relationships wanted the same dating experiences as their friends as soon as they became single.

*I think and part of the reason why I picked OKCupid is because my friends had had a lot more experience than me, so they're a lot more familiar with the ins and outs...I called it OKStupid.  
(Candide, bi woman, CT)*

*Just to see what the crack was really. I'd been in the relationship for six years...I just wanted to see what the fun was with Tinder...Tinder and Plenty of Fish were the first two...Guess word of mouth. My friends have used them so they were the automatic go to dating apps (Mickey, lesbian women, MS)*

Friends were particularly influential on how women navigated their app use. Two thirds of participants (7M/12W/2NB) discussed advice and help from friends about how to use apps including; setting up and writing their first profile; advising them which apps were best for which types of relationships; advice on how and when to send message; what types of photos to use, and; warnings about how to deal with rejection on apps. This support was often reciprocated with participants also giving their friends advice about apps. However, five men and one woman discussed how they currently or previously had no LGBTQ+ friends they could talk to about apps or ask advice from.

*Oh I have a number of friends who've done this [online dating]...[a friend] has been on various sites for years...she's had crazy experiences but she's had some good stories...my brother's been on and telling me the male perspective and he's just like "[Barbara] these are the signs, don't be hurt, within a week or two of talking, if you ask them for a date" (Barbara, gay/lesbian woman, CT)*

*I have a friend who keeps telling me when I'm using dating apps, "remember that you need ask people to do things" (Fitz, lesbian woman, MS)*

*I have friends who I try to coach and, like do conversations and talk on their behalf [on apps] and try to make things happen (Dee, bi woman, CT)*

Just less than half of participants (8M/6W) talked about explicit or implicit rules of GSN apps and dating culture. Some participants felt there were unwritten expectations and accepted norms of behaviour on apps that everyone abided by and mentioned the scripts and meaning behind certain statements or expectations. However, some participants wondered about the rules and accepted apps norms as they felt everyone else knew these rules, but they did not understand.

*I first downloaded Grindr for like a minute shortly after I turned 18...I remember being like kind of repulsed and so I deleted it...Repulsed or maybe like, it was like an environment that I was unfamiliar with and didn't know what the rules were. And it was just like foreign and scary...I think maybe like, an older guy, like, in his 40s was like trying to talk with me and get me to hang out. And I was like, "this is weird. I don't really get what's happening. I feel like he wants something different than what I want. I don't really know what I want. I'm just here to look". (George, gay man, CT)*

*...with men it just means two erect penises. All you need is an erect penis and that's already blatant that they are bringing it to the dating app. With women we are much more... And our scripts haven't been written. We have to define our own social rules. (Alex, lesbian woman, CT)*

## **2b Technology and audience of apps**

The design, layout, functionality and intended audience of apps was discussed by most participants (11M/14W/2NB). The layout of the app influenced how people used it, and there were some differences between genders. Some functions of apps were thought to promote casual sex – the most obvious of these was the design of Grindr which allows exchange of (often explicit) photos within the app, details on sexual position (top/bottom), HIV/PrEP status and the users location in feet/metres. Women talked about the design of apps such as OKCupid and Plenty of Fish (long questionnaires and space for detailed profile text) which promote getting to know people on a deeper level and making serious connections.

*you can get so much more of an idea about [people from a POF profile]. Nobody I met off POF I had a bad evening with. I knew before I met them that, that we were going to have an element of stuff in common... whereas Tinder doesn't have that information, none of the apps have that information. HER I downloaded and deleted it almost straightaway because, from what I could tell, it literally was just looking at pictures of people. (Belinda, queer woman, MS)*

*I felt like I could really express myself on [OkCupid] and it asks you to answer all of these questions, funny questions about TV you like and sex things that you like. And morality things that you like and politics things and other people answer these questions too so it's very easy to see who is relatively on the same page. There are questions like "are you a feminist?" and people will say "no" and then would I even waste my time? (Soot, pan woman, CT)*

The design and layout of each app also influenced who used the app. The name and marketing were suggested as leading types of people to use each app; for example, the double meaning of the name "Jack'd" (i.e. masturbation and physically fit bodies) attracted a toned and masculine man looking for casual sex. Participants talked about users of each app expecting different interactions and these perceptions of the apps were self-fulfilling and led to specific outcomes. For example, men thought Grindr and Jack'd attracted people looking for casual hook-ups, whereas the men who used Tinder were looking for dates or relationships. Therefore, this is how the participants used them. For women there was less distinction between the types of users on each app, though women tended to talk about OKCupid users looking for serious relationships.

*if you're on Jack'd you want sex, don't want a relationship. If you're on Grindr...I mean the word the name is "Grindr", Jesus Christ it's not "Christian Mingle". We're not over here trying to mingle with Christians...This is Jack'd. This is trying to jack off (Jammal, gay man, CT)*

*I feel like people kind of maybe put [the apps] into boxes "okay, I'm going to use Grindr tonight cos that's what I want" whereas "I'm gonna use Scruff cos I just wanna have a conversation with someone" (Sebastian, gay man, CT)*

## 2c Mental wellbeing

A third of participants (3M/7W/2NB) discussed how existing mental health issues affected their dating lives or app use. Participants reported a variety of issues including depression, anxiety, Asperger's/autism, dyslexia, social anxiety and body dysmorphia. These had different impacts on people's lives and most people felt that their symptoms could be exacerbated by browsing GSN apps, talking to people on apps and arranging to meet for dates. However, all of these people continued to use apps and felt the benefits to their wellbeing and happiness outweighed any negative impacts on mental health. For some, their mental health had made them isolated which led them to try using GSN apps.

*...putting yourself out there, I'm fine to do that normally but when it is in a profile everything makes me cringe about what I have written...I have had periods which is tied into my depression in general. I'd rather not answer any messaging apps or notifications for weeks. You just feel that no-one wants to hear what I'm gonna say, I don't want to see what people are saying. And that is when I will leave it a few weeks and not do anything. (Fitz, lesbian woman, MS)*

*I'm very depressed so how to say what happiness is...It's just how I felt since I was 17, I wouldn't say it's connected to Grindr. It was depression and things that led me into thinking "fuck it why not, nothing to lose let's go on this dating app" existential crisis when I was 17. I think it's kick started the depression I think (Phil, gay man, MS)*

Resilience was discussed by two thirds of participants (10M/11W/1NB), usually following a conversation about healthy app use and how people coped with rejection or judgements. Most people who were questioned directly thought they were resilient and did not tend to internalise rejection and negative experiences on apps did not affect their self-esteem. They felt resilient enough to not be too negatively affected by apps. Some people talked about needing "thick skin" on apps and feeling they had this due to age, previous life experience or ability to separate their self-worth from experiences on GSN apps. However, a minority of participants (4M/1W) felt they were not resilient, and apps negatively affected their feelings about themselves, but this did not stop them from using apps.

*I wouldn't say I am very resilient, most of the time. I can kind of say, like recognize, like the fact and approach it in that manner when they don't reply. I can just deal with it and don't take it personally. But it's hard to believe that sometimes. My self-belief it's not as strong as it could be. It is quite frustrating. (Aurelio, gay man, MS)*

*[rejection on apps] at this point is kind of water off a duck's back it is just I don't feel it anymore. (Lollipop, bi/pan man, MS)*

*I think resilience is key cos you are going to get hit back even if you think that you're attractive in some way you will always be rejected, quite constantly I would say...There is nothing wrong with her [points at mock profile she rejected], just not my type. This is what you've got to do. It's a type thing. There could be someone who's super attractive and I reckon they'll get rejected quite a bit (Mickey, lesbian women, MS)*

Four in five women discussed using apps after break-ups, compared to only a third of men. Most women discussed how apps helped them feel better after heartbreak, restore their self-esteem or distracted them from feeling lonely and sad. For some women there was also an element of experimentation with apps as they had been in a relationship for five or more years and apps had not been available last time they were single. Only two women explicitly discussed using apps post-break-up because they were horny or wanted a hook-up, whereas this was the aim for men who discussed post-break up app use. For some men, this led to more risky behaviour on apps or a high number of sexual partners in this post-break up phase.

*I think I realised I just wasn't ready [to be using apps] Like, I may not be over [break up]...I deleted it because I was like..."no I'm not ready to do this". Clearly I am avoiding using the apps. I'm not ready for this sort of thing. (Fitz, lesbian woman, MS)*

*So I do think people need to take a breather in between [relationships]. But I also understand that people don't want to be lonely... Are you getting into a relationship because you have something to offer? Are you getting into a relationship because you need holes filled? Not literally but you know what I mean. [Laughter]. Spiritual or emotional voids. (Alex, lesbian woman, CT)*

*And there was a big reason why didn't meet up with anybody for like, the first couple times I had the app, This is like, feeling um, not trusting...Just I feel like the third time I had Grindr [after break up], I was kind of more of a mess. Just kind of...less cautious. (John, gay man CT)*

## 2d Relationship with apps

Nearly half of participants described their relationship with GSN apps as unhealthy or felt the way they used apps could become unhealthy in the future (6M/8W/1NB). This related to two main factors, firstly mainly men described how apps were, could be or had been addictive; some felt a compulsion to check apps, scan profiles and scroll through profiles. The other factor thought to make apps unhealthy was that participants, mainly women, felt that apps could become a psychological crutch using them purposefully to boost self-esteem and mental health. This reliance on the validation of other app users was thought to be unhealthy especially if the apps were used when feeling low or insecure.

*sometimes I will mute notifications if I am feeling very like, in a low place...when I'm not feeling happy or that I know I'm becoming addicted to them or not good for my mental health I will just like mute them. (Lollipop, bi/pan man, MS)*

*I don't think it was addictive to me but I was reliant on it for self-esteem boosts in an instant way. Erm, so if I was ever feeling super sad, it was just fucking stupid where if you're feeling super sad you shouldn't have anything that, erm...you're banking your mental health on a swipe right or a message or something like that. I mean it's a losing game every time. It's just stupid. (Akina, pan woman, CT)*

When asked if they have a "healthy relationship with apps", only a third of participants agreed and felt confident they were not addicted or did not rely on the apps for their self-esteem (5M/6W). These participants felt they had control over their use and many talked about using apps in phases, forgetting about apps when busy or not investing time in them. Women were more likely to be unsure if they had a healthy relationship with apps (1M/6W) as although they were not addicted to apps they did feel they could see this happening, they sometimes perceived them becoming a problem or they questioned if it was good to use them as an ego boost.



Some people compared their GSN app use to other social media and felt their use of apps like Facebook and email were more problematic.

*I'm probably not the best judge of my own relationship with the apps but it is pretty healthy. It doesn't take all my time, it's not sucking away from my responsibilities, and at the same time it's a lot of fun...like my relationship with most things I do have decent thankful control over. (Soot, pan woman, CT)*

*Hannah: Do you feel like you have a healthy relationship with these kind of apps?*

*Bailey: Yeah I think so. I think the like self-esteem stuff isn't really app itself, it is more like my perception of myself and things like that. And like I don't, I don't use it obsessively*

*Hannah: So if you wanted to stop, you feel like you have control?*

*Bailey: Yeah definitely (Bailey, queer/pan non-binary person, CT)*

## 2e Family and religion

Almost three quarters of participants of all genders in both areas (13M/10W/1NB) discussed their family in relation to relationships or their use of GSN apps. Family could be a positive support network but also cause stress. Participants compared their experience on apps to that of their heterosexual family members; in terms of quality of relationship, how family members met their partners, age differences, or parents as role models. LGBTQ+ family members were seen as a source of support and advice for relationships and feeling happy with LGBTQ+ identity.

*[my mum] would want to be supportive. And then there's my cousin whose been this trail blazer. She's about ten years younger than me and she came out to my Mum before she did to her own. (Soot, pan woman, CT)*

*my parents don't want me to tell [the extended family] and I don't really have a desire to but then, like, me and my ex-girlfriend put our relationship status on Facebook and my parents were like "why did you do that because then Auntie will see" and I was like "hey, I can do what I want" (Savana, bi woman, MS)*

Living with parents and family, either at time of interview or for periods in the past (e.g. between university terms) impacted on some people's ability or freedom to use apps. They were either unable to bring partners home or they were not able to explain their absence overnight – some university students only used apps during term time when they had the privacy of a dorm room/flat. Keeping their sex lives and dating experiences secret from parents was important to some younger participants, however, a minority of participants talked about telling their parents when they had Tinder dates.

*I'm currently living with my brother...I think [my parents] were disappointed when they found out I was gay. Because my mum said she didn't want my life to be difficult. My mum was raised Catholic. And my brother will rat me out if I bring back somebody who isn't my girlfriend...like when it's an open relationship...it just adds an extra level of difficulty. (Natalie, lesbian woman, MS)*

*And then my father found the instruction manual [for a strap on]...he does not like it, [mum] is kind of "whatever". Sometimes it is very hard. Sometimes she is like "whatever" other times she is very prudish Catholic mum, like "oh no don't talk about it now". But he is like "please don't talk about it, please don't let your sister ever see that". I am like "don't worry I won't" (Lollipop, bi/pan man, MS)*



Family and religion were often talked about together with many participants referring to their religious upbringing. Seven participants (3M & 1W in MS, 1M & 2W in CT) talked about their Catholic families, one (1W in CT) their Christian family, and three (3W in CT) talked about being from a Jewish family. These religious upbringings had meant they were unaware of LGBTQ+ relationships when they were young and were not taught about safer sex or LGBTQ+ relationships in school. Religious families had also influenced how “out” people felt they could be growing up. Four participants said they had lost their faith specifically because they could not reconcile religion and their sexual orientation. Only two participants (1M in MS/1W in CT) discussed being currently religious and this guiding their morals or approach to relationships.

*when I came out, I lost my [Catholic] religion. If God did exist, it is improbable but if he did it why would he send me to hell? like I don't want to self-pity but like giving a person a disability and a sexual orientation just to say they can go to hell if they do. It that seems really cruel and I would not want to believe in that God...I quit and I'm an atheist and I'm happier now. (Patrick, gay man, CT)*

*coming from a Catholic school. [Sex] was never talked about. I brought up to a teacher and said "why are we not getting any sex education?" and she was like "we are in a Catholic School, we cannot teach, we can only say to abstain and that is it". (Lollipop, bi/pan man, MS)*

*[My Christian faith] is very important to me, but I don't think that I'm not like a huge I don't follow the rules. Like, I don't believe in a lot of the rules., Christian old school. You know, I'm like, New Testament, like, and Jesus forgave. And every sin is equal. And we're always saying. So like, one thing is, you know, and if it's human nature, like, that's just we have, that's who we are (Zoe, asexual woman, CT)*

## 2f Alcohol and drugs

Alcohol and drugs had an influence on behaviour on apps and participants' decision-making. By far the most widely discussed substance was alcohol (9M/10W/1NB) with men particularly describing how being drunk was likely to make them less risk averse. Men discussed a variety of ways alcohol influenced their behaviour, including when they were drunk they were; more horny; more likely to meet a hook-up more quickly; more confident to message people on apps and more confident to meet for a hook-up; less likely to research a hook-up's social media before going to meet them, and; less likely to meet in a public place when drunk.

For women alcohol mainly gave them more confidence to send messages or “like” more app profiles. Women were also more likely to talk about how alcohol and being slightly drunk made dates easier. Only two participants (1 gay man in MS and 1 pan woman in CT) discussed how being drunk was more likely to lead to condomless sex. A minority of participants (1M/4W) explicitly stated they either never or rarely drank and did not drink on app dates/hook-ups. Two men felt they were more cautious when drunk and worried about issues of personal safety and consent. In relation to other drugs, a minority of participants mentioned occasionally smoking cannabis and three men had seen “420 friendly” or a leaf symbol on Grindr app profiles (references to cannabis).

*I like to meet in person in a public place before anything like that really happens...Soberwise... it can be different [when I'm drunk]...I can have quite a few drinks and then be, like, "you know what I'm on top of the world, nothing can stop me. [laughing] Come on over, I'll come right to your hotel right now, I don't give a shit". [laughing]. (Jesse, gay man, CT)*

*I have made some quite bad decisions [when drunk] to be fair, definitely...it's just unprotected sex definitely. Some regrets I have done then and also, I guess it's kind of classic morning after "oh they are not as attractive as I thought they were"... unless I was in a relationship like I don't think I would ever have sober sex with someone, like, without protection...Yeah I think on the drunken one night stands it's just kind of that, condoms are never like the first thing on your mind whenever you're like another state. (Sam, homosexual man, MS)*

*[I meet dates in] Bars. I believe the best way to get to know somebody is to get drunk with them. (Belinda, queer woman, MS)*

One of the mock-up men's profiles mentioned "P&P" (party and play, AKA chemsex) and this was discussed by 16 men and the one non-binary user who used Grindr. Most men in MS and CT had seen references to "chemsex" or crystal meth on GSN app profiles, mainly on Grindr, including "P&P", "Party & Play", "chems", "high and horny", "T" or "Tina" or an emoji such as a crystal, pill or syringe. The participants who had not seen any mention of chemsex on apps tended to be younger. No participants were interested in or engaged in chemsex and ten men discussed how they actively avoided profiles that subtly or explicitly referenced chemsex. Many of those who avoided such profiles were not just uninterested in the drug use but inferred men who used such drugs were also high risk as they were likely to have lots of sexual partners, not always use condoms and possibly share needles.

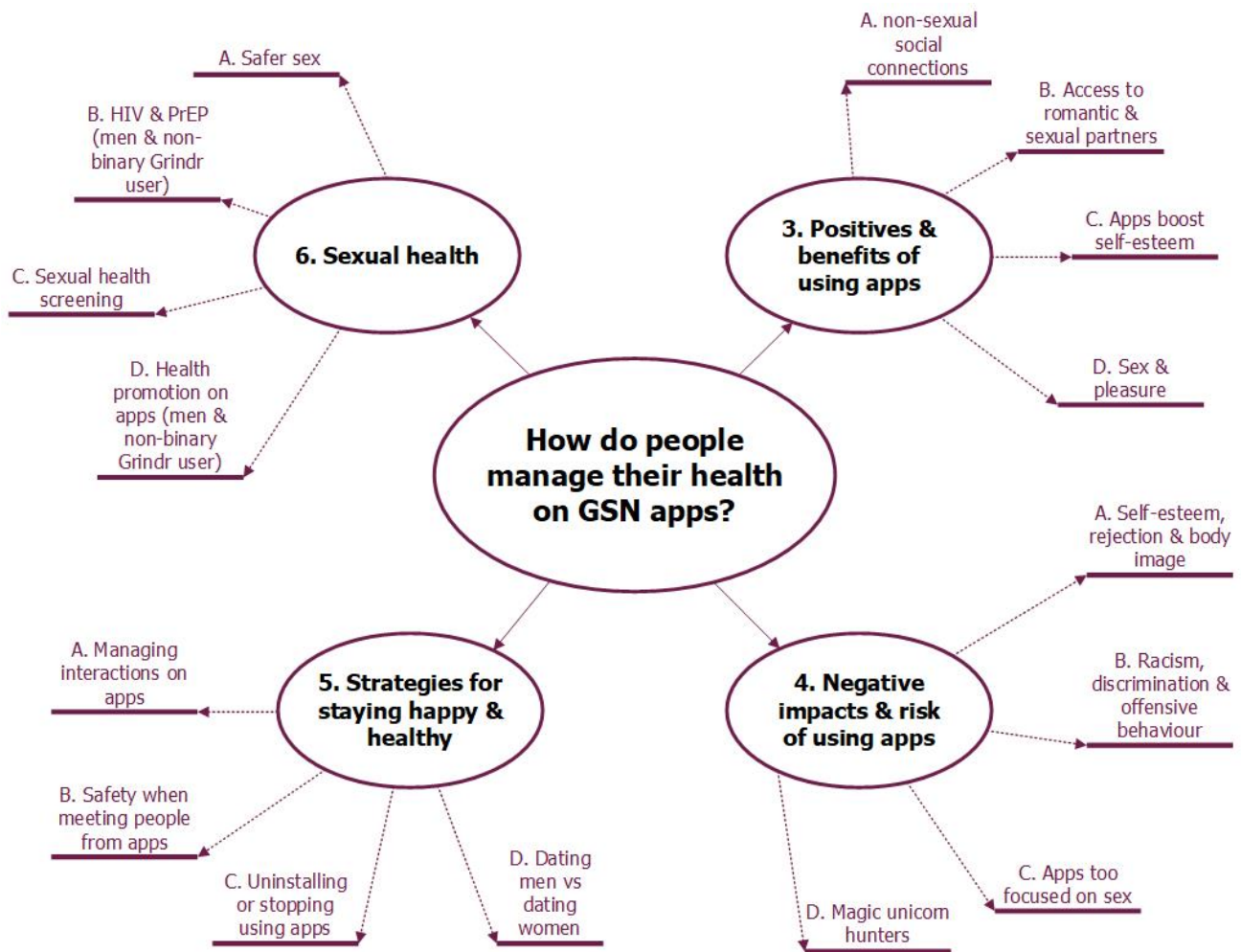
*I can't stand that. I think it's disgusting, horrible drug, you're awake for fucking 7 days and then you come down for 3. Like all these gay guys, looking to party, you wanna party? What you want to have sex and get high for 12 hours?. I think it's gross, like, people message me and they're like "hey, me and a group of friends are looking to party" and I'm like "how many are there?" and sometimes they're like "oh it's just me and two friends" or "me and my group of seven" and I'm like "okay, that's a lot of drugs to go round"...I do not get involved. (Jesse, gay man, CT)*

*I think that, like, erm, I'm not into drugs so if there's anything that involves those type of things, like, you know, I try to steer away from that. So probably, like, people have been offering Chemsex and "I can do this while you're having that" or, like, probably unsafe sex, so, like, with a stranger I don't do that with a stranger. (Yellow, gay man, MS)*

### 7.3.3 Theme 3: Positive health impacts and benefits of using GSN apps

All participants were asked about the benefits of using apps and any positive impacts it had on their health, wellbeing or happiness. Four sub-themes were identified; *non-sexual social connections*, *access to romantic and sexual partners*, *apps boost self-esteem* and *sex and pleasure*. The only significant gender differences noted were in the *sex and pleasure* sub-theme which was considered more important for men than women. For all other sub-themes, only minor nuanced gender differences emerged. For example, all genders talked about using apps when bored; however, men tended to associate feeling horny with being bored whereas women never linked the two emotions. No differences between the two areas were identified.

Figure 7.5: Theme map - managing health on apps themes, and sub-themes



### 3a Non-sexual social connections

All genders in both areas reported their app use had led to satisfying and enjoyable non-sexual social relationships for example platonic friendships, reducing isolation through connections to local LGBTQ+ community, meeting people when they moved to new areas or when travelling and killing time when bored. Half of participants talked about feeling lonely or isolated at some point and using apps to try to reduce this. For those who had just “come out” or were exploring their sexuality, apps were an important way to meet local LGBTQ+ people and it opened doors into friendship groups. Apps also provided a sense of community; participants liked seeing other LGBTQ+ people on apps, even without talking to them or meeting up. Learning there were LGBTQ+ people locally or internationally helped them feel more comfortable and less isolated; this was especially important for people who lived in small towns or rural areas.

*[I started using apps] January last year...it was my new year's resolution last year to make some more friends. I found Grindr really useful. Well [I made], one friend really. But we're still friends. And I met other people through them (Aurelio, gay man, MS)*

*And so this one person I connected to, she gave me hope because it was like, "oh, there's an asexual out there who's like me and she's feminine and she explored the world"...and almost all were very much like me (Zoe, asexual woman, CT)*

A third of all participants reported making friends, increasing social networks or accessing the queer community through apps. Although platonic friendship was a motivating factor for using apps for minority of people, the majority reported friendship was a bi-product of app use; many participants discussed how they stayed friends with someone they had dated or hooked-up with.

*Meeting new people. Like that sounds really lame, erm I just I like the opportunity to go and do things like I love going to different restaurants and I love doing new things...So if a date doesn't work out [but you have] a lot in common, I would much rather continue to be friends...It's like, I'm not just looking for sex, I'm also looking for friendship. (Natalie, lesbian woman, MS)*

*I guess you get to meet people. And if it isn't going to develop into anything else you get to keep them as a friend if they are funny or feel like they could be a good friend. So it's just an easy way to meet someone...(Mickey, lesbian woman, MS)*

A third of people discussed using apps when they move to a new area, for work or to study, as a route into the local LGBTQ+ community, moving communication from apps to face-to-face friendships. Using apps for non-sexual reasons when travelling or was a key benefit mentioned by a minority of participants; some of these turned into sexual encounters but in the main, they were more about local connections and enjoying the travelling experience.

*When I [moved to] Liverpool. It was me and my flatmates...using Tinder just to see what was going on in the city...to see what kind of people were in the city (Bridget, bi woman MS)*

*So, like, I knew I wanted friends and I knew I wanted to be in the queer community, I didn't really know how. I moved there and I knew nobody. I moved to [Midwestern town] totally alone. (Dee, bi woman, CT)*

Half of participants discussed using apps to kill time when bored, or to entertain themselves. The routine of looking through profiles on apps was referred to as "window shopping" by some participants. Many times, this browsing happened when participants had no intentions of meeting up or even talking to other app users. The only difference between men and women on this sub-theme (*non-sexual social connections*) was quite nuanced; men were more likely to talk about a state where they were both bored and sexually aroused ("horny") at the same time; no woman talked about these two states co-existing.

*sometimes I'll be bored and I'll see the Lesly app. It's one of those apps that lets you, it'll show you photos. Tinder has revolutionised so you have an X or a Heart. Usually I'm X-ing all of them. So I still do that, which I probably shouldn't but it's really a boredom thing. (Alex, lesbian woman, CT)*

*in that state where bored and horny or whatever...just send as many "hey" messages as I could [laughter]. (Luffy, gay man, MS)*

*Yeah, you wake up at 4am. And you're bored, you're a little horny. And you can just you can talk to anybody across the world, which should be very interesting. It's kind of fun. You can go to profile have a good time...Hey, you never know who's gonna answer back. Yeah...It's kind of exciting. Low key. It's interesting. It's fun. (Jammal, gay man, CT)*

### 3b. Access to romantic and sexual partners

One of the main benefits of GSN apps, discussed by more than three quarters of participants, was that it increased the pool of potential partners and allowed access to queer people they were unlikely to meet otherwise, and people who were not a friend's ex-partner. For some participants the numbers of potential partners on apps improved their odds of finding a compatible partner and allowed them to be more selective about who they chose to date; which had led to more fulfilling or happier relationships. However, participants of all genders also discussed how the same local people often showed up on different apps – for example, they would see the same man on Tinder, Grindr and Scruff.

*I mean we touched on briefly how it is a numbers game. I think that's really important because, like, it is about what in reality what are my chances of meeting "the one" in like an actual real-life situation? When all the odds are stacked against me, like, I feel like it's just impossible. So I do like the concept of Grindr for that (Steve, gay man MS)*

*using the app also lets me feel like, you know, that there's so many, I can see all the people that I can potentially be dating...so I could be more selective. (Candide, bi woman, CT)*

*I don't know if it's the same for gay men...like, gay women, like everyone knows their fucking ex's fucking best mate, whatever, you know, it's not uncommon to date the same woman as somebody that you know whereas in the straight community it would be fucking unheard of... Yeah so it enlarges the pool I suppose. (Belinda, queer woman, MS)*

Half of men talked about how apps made it generally easier to find partners; smartphone apps were quick, convenient and could be used at any time. Most men discussed this in terms of sexual partners rather than long-term relationships and the "ease" related to speed. A third of women also talked about how apps made it easier to meet partners, however, women tended to focus on how apps enabled them to get to know potential partners quickly; conversing on apps was a low commitment way to avoid wasting time meeting unsuitable partners.

*terms of it's accessible, Grindr, those apps, they're accessible, you know, cos when you're at work, when people are at work sometimes they look at it and looking for a Friday night, they want to fill a gap, so they're making arrangements there. So time becomes, like, can be, convenient and everything (Yellow, gay man, MS)*

*But what I like about apps is, you get to know a lot of things like if I'm at the supermarket, I don't know if you're married, I don't know...So for that reason, I like that, I don't have time to waste, you know. (Zoe, asexual woman, CT)*

The geographical information provided on apps helped facilitate all types of connections and relationships. Two thirds of participants of all genders discussed the GPS function of apps and the location of potential partners. Those who were looking for something casual wanted to find people in their city or close by; this was particularly important for students and for younger people who did not drive. For some people, in both MS and CT, who had previously lived in small towns or rural areas having potential partners locally was a nice change. People looking for something serious tended to be happy to travel further; however they still had limits, usually about an hour's drive.



*That is another thing I like about dating apps, the miles thing because I know how close they are. I want to talk to people that I can meet in real life for once [laughter]. (Bridget, bi woman, MS)*

*I was thinking if I go for a serious relationship with somebody I would like to see them quite often I don't want someone in New York or someone in Boston [both ~2hrs away] where you can only go every weekend that doesn't work out (Peter, gay man, CT)*

*[looking at woman's profile number 1] She's alright, yeah. Er, I'd get rid of her though, she's in Bolton [35 miles away], like, I dunno. I'd usually get rid of anyone who isn't either Manchester or Liverpool. (Savana, bi woman, MS)*

Love and long-term relationships were an important a positive outcome of apps. Ten people (5M/5W) discussed how they'd found had a serious relationship with someone they had met on an app. Some had been looking for a serious relationship but others were not necessarily looking for a long-term relationship when they met their partner on the app.

*Tinder brought me to the greatest relationship I've ever had. I met the most amazing man, the most beautiful man that I still love so much. Tinder gave...that to me. (Topher, gay man, CT)*

*actually it was just a hook-up and then we got on quite well, like I kind, we both felt embarrassed because it's obviously like a sex app, but like we had really good banter and stuff. So we were like "it's a bit weird but do you want to go for a drink?" like and maybe just not have sex? [laughter] (Sam, homosexual man, MS)*

### **3c. Apps boost self-esteem**

Over two thirds of participants (10M/13W/2NB) of all genders discussed how using GSN apps could boost their self-esteem and wellbeing when they received compliments or got "likes" or messages from attractive app users. For most, apps made them feel like others desired them, which increased their self-esteem. For some participants who had anxiety or were shy and introverted, they felt apps had really helped to boost their confidence by providing a safe opportunity to talk to other people, practice communication and flirting to the point where they were then able to meet people "in the real world".

*...it's really nice for your ego. It's a nice boost and I think that's probably why some people are, you know, drawn to that cos it's, like, instant gratification, flattery, almost instant. (Candide, bi woman, CT)*

*...some people literally come and say some really nice things and that, usually in just a small conversation and it can be quite nice, uplifting (Robin, no term, non-binary person, MS)*

*I'd say in the long run it's been a good thing. I used to be a lot more self-conscious about things, how I look, how I act, how I speak. All that jazz. I would say being on Grindr has really boosted my confidence. (Phil, gay man, MS)*

However, apps could also damage self-esteem; half of participants discussed apps having both a positive and negative impact on their self-esteem and for some it was a challenge to balance this (discussed in theme 4a)

*it goes both ways. A good way because it's instant gratification, it's an ego boost when someone hot matches with you... "Oh my God, I'm so happy" and then, you know, when that person doesn't answer you back it can be detrimental to your ego, your self-esteem." (Akina, pan woman, CT)*

### 3d. Sex and pleasure

Nearly half of the men interviewed discussed how sex and the pleasure of sex was a positive outcome of using GSN apps. This sub-theme showed a significant difference between genders as no women or non-binary people discussed sex and pleasure as a benefit of apps.

*Hannah: the other positives, what do you get out of [app use]?*

*Lollipop: a lot of ass.*

*Hannah: [laughter] sex?*

*Lollipop: sorry yeah [laughter]. (Lollipop, bi/pan man, MS)*

*Hannah: What would you say are the benefits of using the apps?*

*Bernard: A good shag. It is, it's just like, it is literally just if that's all you want, you know, you get what you want. (Bernard, gay man, MS)*

Half of men also discussed using apps for “sexting” other app users they were unlikely to meet. Sexting is exchanging explicitly sexual messages or pictures, and this was talked about as an enjoyable part of app use. No women or non-binary participants discussed using apps for exchanging images with app users they had not yet met.

*I'll still like sometimes log on to chat with people. Usually if I'm like going to masturbate but I don't want to hang out with [man he is dating]. Yeah, I like do that with people. And usually I use Scruff for that because you can talk to people who aren't local to you. (George, gay man, CT)*

*I don't mind [dick pics] like that's what Grindr is there for. I don't mind the fact that they send me those pictures, In fact I like it. (Patrick, gay man, CT)*

### 7.3.4 Theme 4: Negative impacts and risks of GSN apps

As well as the positive impacts of app use, participants had also experienced a variety of negative effects on their health and happiness. Four sub-themes were generated; *self-esteem, rejection and body image; racism, discrimination and offensive behaviour; over-sexualised focus of GSN apps*, and; *“magic unicorn hunters”*. Many participants experienced these negative outcomes alongside the reverse positive outcomes. For example, apps had both beneficial and detrimental impacts on self-esteem; the sex focus of apps was frustrating but apps led to sex and pleasure, and; the ease of meeting people through apps meant it was sometimes difficult to form deeper connections. There were some differences between men and women on these sub-themes; mainly men reported wide experience of body shaming, racism and prejudice on apps; participants who dated men felt apps were too focused on sex at the detriment of deeper connections, and; only women discussed requests for threesomes from men/women couples on apps.

#### 4a Self-esteem, rejection and body image

As mentioned above, half of participants discussed how apps had both a positive and negative impact on self-esteem. Nearly two thirds of participants (9M/9W/1NB) felt GSN apps had damaged their self-esteem or dented their ego. This harm to their self-esteem was caused by two main factors 1) being rejected (online and in real life), and 2) the way apps focus on looks and physique.



Rejection was discussed by two thirds of the participants (9M/12W/2NB), with no difference between areas or genders. Some participants discussed being “ghosted”, after sex or after a date. Ghosting is a colloquial term for when someone ends a relationship suddenly and without explanation, not replying to any communication and often blocking them on all forms of technology (Freedman et al., 2019). Ghosting, as opposed to being told outright, was particularly hurtful and insulting. The other form of rejection that people found distressing, though not as upsetting as ghosting, was when other app users ignored their messages or were ambiguous in their responses. Ghosting was viewed as both rude and made participants question if they were unattractive or how they came across on their profile.

*Phil: I had my first time [sex], I saw him once, just talking, getting a feel for him, met again [had sex] and then didn't see him after that...just straight up stop talking to me, after he took my virginity too*  
*Hannah: That sounds like, did they do that ghosting thing?*

*Phil: Pretty much. He was kind of nice too. Maybe he thought I got too attached or something, I didn't like him that much. [After he ghosted me I was] bit pissed off. I mean stuff happens, I didn't want a relationship but we could have just kept talking (Phil, gay man, MS)*

*What I didn't like [about apps] is you have to have a very thick skin. And I was told "you're really polite, the rest of the world is not" and, so, I would say "hi, I read your profile, we seem to have this in common, would you like to talk?" Nothing, nothing, nothing...If someone was to write to me and I wasn't interested I'd say "thank you for being brave, erm, I'm dating someone" (Barbara, gay/lesbian woman, CT)*

Over two thirds of men (11M) talked about body image, how apps made them feel about their looks or discussed body-shaming on apps. However, this was not as important an issue for women with only five women discussing body image. Most of the men (and the non-binary participant who used Grindr) thought apps were too focused on image, bodies or how people looked. This focus on physical appearance reflected the gay scene in real life but was exacerbated by the design of apps, which places photographs at the forefront and gives priorities to visuals over text. Some participants thought there was a difference between apps with Grindr being particularly focused on body image.

*I think there is such a pressure to like, particularly within gay people, to be in the gym every day to have that six-pack to have shiny whites [teeth]. Like, be six foot...I think it's there because it's purely based of how you look you can maybe start to doubt your own, maybe feel ugly or unwanted, if you did take those comments [about body preferences on app profiles] to heart. And I think because it is an app it is 24/7 as well. (Sam, homosexual man, MS)*

*I'd say because Tinder, Grindr, Bumble, literally any of those kind of ones all kind of, how do I put it, they come off so, not aggressive but it's all too body shaming...Everyone, everything is, I don't really care about looks per se, it's more about personality. (Jesse, gay man, CT)*

*Erm, [profile comments about preferred body types] add into the problem with, I've been saying this for years, the problem with society is everything's about how you look and everything's very body shaming. (Robin, no term, non-binary person, MS)*

Most men had seen judgemental statements on apps profiles (e.g. “no fat people” or “fit guys only”) and found these offensive, though not as bad as racist statements (see theme 4b). These statements reinforced the

stereotypes and were seen as “body shaming”. Some men had been rejected on apps or received spontaneous insults or offensive direct messages because of their weight or appearance, mainly on Grindr. It was not only the direct comments about their bodies that made them feel bad; comparing their bodies to other men on apps also had a negative impact on self-esteem. Some men acknowledged that photos on GSN apps were not always an accurate representation of someone but still felt this negative impact. A minority of men talked about attractiveness in terms of value, with slim and toned bodies being worth more than a less-toned, fatter body. Physically attractive app users, such as the toned torso in mock profile no. 2, were talked of as being higher status or hierarchy; some participants judged themselves as being “not good enough” for these attractive, high value men.

*How could you not take it personally on some level when somebody literally just rejects you because they don't like the part of your body...I think being on Grindr is like going to a butchers for some people. "Oh that is a nice slab of meat, oh that one has too much fat on it" (Phil, gay man, MS)*

*I think there's like a culture of like, superficiality to [apps]. I mean, dating can be like that in general, but when there's just such a focus on like how your body looks, for gay men...It's not good [for self-esteem]. It doesn't feel good to just like scroll through people who were like purposely highlighting the best aspects of themselves. Like it feels fake. (George, gay man, CT)*

*[when I see profiles saying "no femmes" or "no fatties"] I just go "fuck you" and move on. "Fuck you, this is real life it is not porn". I don't know how it works but I always imagine those kind of people...get messages from like 7s and 8s but expect 9s and 10s, or just flat out 10s. But you're allowed to have your type but I feel like they're too picky. (Lollipop, bi/pan man, MS)*

Only five women discussed body image and apps; either in terms of how their own self-esteem issues were exacerbated by apps or they were concerned about how their physical attractiveness would be viewed by other app users. No women had received any negative comments from women on apps but some plurisexual women had seen statements on men's profiles about preferred body size and on women's profiles about style or body type.

*I think that is largely because I've put on a fuckton of weight recently and I feel, I am fatter than my photos and that doesn't feel good and as much as I'd love it to feel absolutely fine and, you know, politically speaking, but it doesn't, it feels like, I don't want to walk into, like, essentially a blind date with somebody and them be like "you don't look like your profile" (Belinda, queer woman, MS)*

*Men looking for women, sure, they never want fat women. There's so much fat phobia, like tonnes of fat phobia. (Dee, bi woman, CT)*

#### **4b. Racism, discrimination and offensive behaviour**

Generally, men had more experiences of offensive, discriminatory or bigoted behaviour on apps; these were virtual interactions that had a negative impact on their wellbeing even before they met up with someone. Almost all men and the non-binary Grindr users in both CT and MS had seen racism on the apps aimed at casual sex and hook-ups. Examples ranged from statements such as “prefer white guys”, to profiles explicitly stating “no Asians” or “no blacks”. The vast majority interpreted any statements as racism and discussed how sexual preferences were acceptable but it was unacceptable to state them on your profile. Most participants also

discussed how seeing statements about race/ethnicity were so off-putting that they would block or ignore any men who made such statements, not matter how attractive or appealing they found the rest of that user's profile.

*I always feel like there's a lot of hatred on the apps, there's a lot of, you know, like the racism and that to me is just so disgusting, I hate seeing that... I will look at the profile and if I see any of that I will block them immediately. (Sebastian, gay man, CT)*

*like the ones that say "no Asians or no blacks" I feel like that's a bit much. "No Asians" seems to be the primary one I see. Rarely do I see like "no blacks". I guess some people see it as their personal preference and attractiveness, so they don't see it as racist. I can sort of understand that aspect... [but] if you just don't like them just say, don't be saying on your profile "I'm not into this ethnicity". (Luffy, gay man, MS)*

The participants were predominantly white and only two of the users of men's hook-up apps/Grindr were from a BAME group. One African American participant, Jammal, did not comment to the "prefer white guys" statement on the mock profile and the interview did not return to the topic of race/ethnicity. Yellow, a South Asian man in MS, had seen statements on apps about preferred race/ethnicity but was not upset or particularly annoyed by it.

No women had seen any specific statements about ethnicity on women's GSN app profiles. However, many women discussed how their male gay/queer friends experienced racism on Grindr. The woman who had seen racism on apps was Akina, a pansexual woman of mixed ethnicity in CT. She had seen men on apps make references to Donald Trump or "All Lives Matter" - she felt these were widely understood to be an indirect way to deter women of colour. Natalie, a lesbian woman of mixed ethnicity in Merseyside, discussed how she had experienced racism from partners she had met on apps and wanted app users to be more explicit about their preferences then she would not be "surprised" by offensive racist behaviour when they met in person.

*Like I hate seeing men say things like, it's mostly men...they'll say something that insinuates they're love for Trump, just to deter black women. And I've seen that and it kind of bothers me...'Make America Great' is, like, a big symbol...everybody knows what that means. (Akina, pan woman, CT)*

*Natalie: It's not that explicit, but [racism is] very much still there it is just sometimes with women things are a bit more unspoken, and it sounds mad, but in a way I kind of wish people would just be open about that...be openly racist [laughter]...don't want to waste a meal on you*

*Hannah: Let's not have surprise racism halfway through the evening?*

*Natalie: Yeah, it actually no, it doesn't come out halfway through the evening it comes out when you're in bed together... (Natalie, lesbian woman, MS)*

Half of participants who used Grindr discussed seeing many statements such as "straight acting", "masculine men", "no femmes" or "no camp". These sorts of statements were interpreted as discriminatory, homophobic, and made participants quite angry. Some participants interpreted these statements as a form of internalised homophobia from men who were reluctant to identify as gay or bisexual. Most of these participants questioned the definition of "straight acting" or being "masculine", as these terms felt meaningless as well as insulting.

*[looking at a mock profile 2] "hot straight guys" for one, that pisses me off straight away. It's just this whole like gays being homophobic sort of thing. As in this kind of, like, camp isn't desirable "I want a straight guy". He's not fucking straight if he's fucking your ass. He may be into men and he may be into women as well, but it just kind of pisses me off that whole sort of like "oh yeah but he has to act straight". (Steve, gay man MS)*

*[pointing at mock profile 2] "no femmes, fit guys only, no fatties". Well I'm somewhat effeminate, so I don't think he'd be into to me. I wouldn't describe myself as fit. And I think, but even no femmes, yuk. All of that is just. it's just like, really rude and offensive and gross. (George, gay man, CT)*

*...try saying "straight acting" with a dick in your mouth (Lollipop, bi/pan man, MS)*

Although offensive behaviour (e.g. racism, body shaming and discrimination) was mainly discussed by men, two third of participants (12M/9W/1NB) also discussed subtle forms of rudeness. The line between preferences and rudeness came down to how people phrased things on apps. The men's mock profiles included some outright antagonistic statements as such as "no fatties" as well as some more neutral statements such "love big hairy guys". Men talked about the balance of expressing preferences but not being rude or offensive; with a subtle difference between being honest but not bad mannered. The plurisexual women who also used apps to meet men also found these types of preference statements rude.

*"No femmes, fit guys only, No fatties". I'm like okay, you're an asshole too. (Jammal, gay man, CT)*

*Not many to do with race I don't think more to do with personality, body...It is kind of a double edged thing, at least you know what they want, but at the same time why are you being so rude? [laughter] (Aurelio, gay man, MS)*

Participants also talked about declarative statements and demands or requests in terms of positivity and negativity. A distinction was drawn between app users who expressed a preference in a positive manner (i.e. "I like athletic guys") compared to stating preferences in a negative statement (i.e. "I don't like fat men"). The balance of how someone expressed themselves would influence if they were thought to be unappealing, rude or prejudiced.

*like [mock profile 3] says like he loves big hairy guys I think even though he talks about criteria the same as [mock profile 2]...if you have this particular sexual interest in people, and an attribute that you like. It's not the same as like cancelling you know, like, saying, "if you don't have a hairy chest don't message me", so I think it's like the phrasing of that...he has listed that he wants. (Sam, homosexual man, MS)*

*So if they say for example "only fit guys", or "no fatties.". I think that is a very negative way of approaching it. I mean you can also say what you do like, instead of specifically narrowing it down. I think this is too many "no"s. "No strings attached, no femmes, only fit guys, no fatties" ...It is better to say something like "I do like this" and "I do like that" (Peter, gay man, CT)*

Some men (and women who dated men) felt the anonymity of the online space and the format of apps allowed users to be more direct, bad mannered and rude with their requests. The lack of face-to-face contact allowed people to disregard normal social rules and behave in a manner they would not behave in person.

*I mean gay men are kind of shallow. So you can be an absolute twat and still get laid, as long as you're fit... [Pointing at mock profile 2]. Prick (Steve, gay man MS)*

*I think it's, it's not always a very kind space...I think the anonymity lets people feel a little bolder in being rude...people are more callous with their words. I usually have a thing in my profile about like, about some of my political beliefs. And so people will like confront me about them often very aggressively, (George, gay man, CT)*

#### **4c Over-sexualised focus of GSN apps**

Just less than half of the men discussed how they disliked that apps were predominantly focused on casual sex, hooking-up or exchanging explicit photos, at the detriment of deeper connections. Most of these conversations related to Grindr or Jack'd. The majority of men did occasionally use apps for casual sex but felt like most app users were only interested in talking to them if it led to sex. The focus on sex was thought to dehumanise people and ignore personal connections, personalities and feelings. The sex focus was widespread on most of the men's apps and perpetuated by the app names, marketing and design. However, some men felt some apps were more relationship or dating focused than others (i.e. Tinder; see theme 1b)

*[Grindr] doesn't have any, or rarely has any romance to it. Which is sometimes that is disappointing, other times I don't mind but you know...Could you not just like romance me a little bit man? (Lollipop, bi/pan man, MS)*

*I think Grindr is gross. People will not even send a hello so, it'll just be a picture of a dick. Or there will be blank profiles...There is this sense of people just hiding all the time on Grindr. I don't like that cos you never get to really know someone, you don't have the option or the opportunity to get to know who is on there. Whereas Tinder is a little different. (Topher, gay man, CT)*

The frustration with apps focusing only on sex was discussed by all genders who dated men (either exclusively or as well as dating women). Women and non-binary participants also reported men sending them "creepy" or unwanted sexual comments or focusing on sex when they met up. This topic was very common for the bi-sexual women and non-binary participants, with all but one (a bisexual woman who had never met a man from an app) being annoyed that men were overly focused on sex. Very few participants had seen women's profiles that referenced sex or focused on a sexual element of the communication. The only sexualised women's profiles included subtle hints such as photos of women in swimwear or using suggestive emojis (e.g. devil or winking face). Only one woman talked about having received overly sexual comments from a woman on an app.

*People don't act in a way that they would act if they were in your face and would have to deal with the consequences of that situation. So if man walked up to you and said "are you down to fuck?" you could slap the shit out of him right there (Akina, pan woman, CT)*

*Or, you know, sometimes a guy would message me and they're like "you seem to be, like, a freak in the sheets" and I'm like I think it's just too forward. (Candide, bi woman, CT)*

A third of people (4M/6W) discussed how apps made them feel very judgmental, shallow and guilty as they were also focusing on this sexual or physical side of profiles. The process of scrolling or swiping through profiles on apps was dehumanising, reduced people to their sexual attractiveness and participants admitted they could forget other app users were humans with feelings and lives. Nevertheless, this did not stop them using apps.

*"I'm bored and I'll find myself I'll swipe [on Tinder], I'm not looking at these people, I'm not humanising them at all, it's a catalogue, it's window shopping...and de-humanising in that sense. It sounds horrible and it's not in a mean way, I'm not saying that people are malicious about doing it but it's de-humanising...I love human beings so much...I find myself being that way on apps and it upsets me about myself (Akina, pan woman, CT)*

*I have an issue with myself I find with Tinder you can be incredibly judgemental so quickly...I was swiping left [rejecting people] like just going at it and I felt horrible, I felt bad like I was just dismissing all of these people out of my life. By body build, by race, by their hair, but just swiping left non-stop...I still do it. (Topher, gay man, CT)*

#### **4d "Magic unicorn hunters"**

An issue that was unique to women and non-binary people who used apps to meet women was the regular requests for threesomes from male/female couples. Three American women used the term "magic unicorn hunters" to refer to the male/female couples who use apps to try to find a woman to join them for a sexual threesome. Bailey, a queer/pan non-binary person in Connecticut explained the term "magical unicorn experience" as:

*So you get a partner who is traditionally a bisexual woman, who is interested in having sex, the woman and also a man, in a monogamous couple relationship. And it's unicorn because it like doesn't exist really [laughter] (Bailey, queer/pan non-binary person, CT)*

Only two women reported never having seen profiles from male/female couples and these two participants were only using apps specifically aimed at monogamous or asexual people. Fourteen participants (13W/1NB) discussed how such profiles were very common across many different apps; however, there was disagreement about which apps had more of these types of profiles/requests. These couple profiles were so common and unwelcome that some women stated on their profiles that they were not interested in threesomes.

*I actually wrote something along the lines of "yes I am bisexual, yes it is a thing, no I'm not looking for threesomes" [laughter] (Bridget, bi woman MS)*

*Hannah: so do you see many of these [profiles looking for threesomes] on Tinder?*

*Mickey: Yeah, I'm going to guess about one in 25. I can't remember them on POF, more Tinder. (Mickey, lesbian women, MS)*

The majority of those who used apps to find women were adamantly opposed to threesomes as either they did not find men sexually attractive, or they did not want to have this kind of experience. Many women discussed how profiles of male/female couples looking for a queer woman for sex made them angry as it was intrusive in the queer space or wasting their time. A third of women, all from Merseyside, discussed explicitly disliking the misleading way most couples presented themselves on GSN apps; by predominantly presenting the woman's pictures, she does most of the communication and is not necessarily upfront about her relationship status from the start. Even women who were potentially open to a threesome viewed this behaviour as deceitful and were annoyed by this approach.

*Hannah: you saw a couple [on profile 4] and went "absolute no"? So why not?*



*Courtney: couple. I don't like men. At all. So any woman that's on there with her husband or boyfriend wanting to have sex with me, it's not going to happen*

*Hannah: No. Did you see many profiles like this?*

*Courtney: Yeah, loads. Loads [stressing] (Courtney, gay woman, MS)*

*I don't appreciate that [laughter] If it was a queer couple of two women, I would maybe consider it. It's very annoying to have a lot [of these profiles] on women apps. Like, I don't know, I don't know why, it feels like they're like, taking up space in a way that like, that's not super logical... You're like, in the way of all of the gay women I could be swiping on (Emma, gay/lesbian woman, CT)*

*They will put the woman first, and then, like, show that there are actually a couple and I find that more misleading. So I always swipe left on those, because it's like, it's like a bait and switch almost.*

*And I don't agree with that whole approach to it. (Natalie, lesbian woman, MS)*

Although some participants were using apps to find polyamorous relationships only one participant was using apps to find a sexual partner for threesome. Dee, a bisexual woman in CT, was using apps exclusively to meet a woman for sexual experience with her long-term male partner. They were trying to find someone for a longer-term sexual arrangement not just a one-time hook-up. She discussed at length how they approached women on apps and went to a lot of effort to ensure she did not come across as “creepy” or “weird” on apps.

*I would hang out with them, usually, a few times, so we tried with maybe three girls that either one way or another got shot down. But it's always I meet them first, I do the talking to them singly, I meet with them first, maybe go on a date, that's semi-romantic, semi-suggestive or semi-intimate, semi-personal and then I bring up the fact, during that second or third date, "by the way I have a boyfriend", you know, like, "what do you think about that?". And by that time they already like me enough so they're okay with it and they're comfortable and more open minded, I've softened the blow. (Dee, bi woman, CT)*

### **7.3.5 Theme 5: Strategies for staying happy and healthy**

All participants reported a variety of approaches they took to reduce risk to themselves and ensure a positive and satisfying outcome of their app use. These have been divided into four sub-themes: *managing interactions on apps*; *safety when meeting people from apps*; *uninstalling or deleting apps*, and; *dating men compared to dating women*. There were no differences between areas however, women and those who were plurisexual described using different strategies compared to gay men.

#### **5a Managing interactions on apps**

All participants discussed “faceless profiles”; GSN app users who do not include a picture of their face online. Some, but not all, of these discussions were prompted by the mock profiles; two men’s mock profiles had no photo (permitted on Grindr) and one women’s profile included a picture of her face obscured by a cat (Tinder has stricter rules on profile photos). Most men had seen faceless photos however they were much rarer on apps used by women. Most participants actively avoided faceless profiles, or would only interact with a faceless profile if it stated why there is no photo (e.g. user’s job) or they sent a photo by direct message. Faceless profiles could be “catfish”; all participants said they would not meet up with someone without ever having seen a photo, although a minority had in the past. There were four main reasons people wanted a face photo; to know if they were attracted to the person; they needed a face for a connection and to be able to imagine who



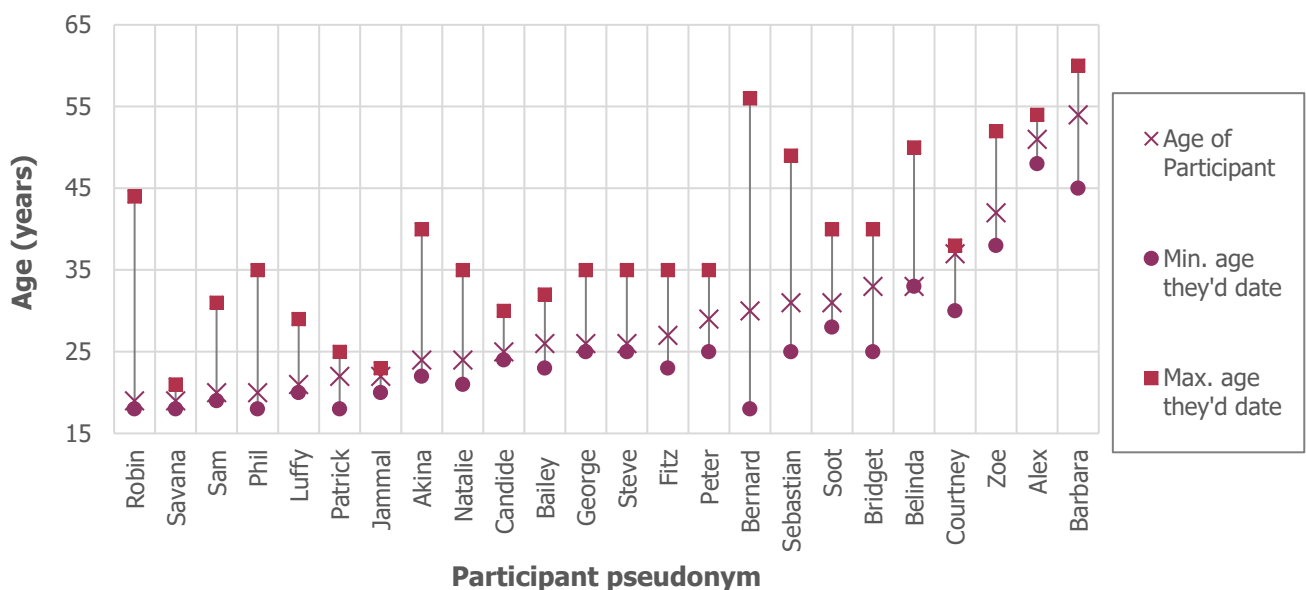
they were talking to; they assumed the person was either unconfident or ugly, and; a minority of people felt it was unsafe or suspicious when users had no photo. Some men suspected app users who did not have face photographs were in the closet or secretive about using GSN apps; this was rarely mentioned by women.

*when you don't show your face you're hiding something...at least when you're willing to show your face, whatever your intentions are, at least you're showing them and hopefully you're not using a fake profile...Either they're discreet, as in they don't want people to know that they're on the website or they're not who they say they are. I feel like those are the two options (Sebastian, gay man, CT)*

*This is going to sound really fucking wanky [pretentious]...I feel you don't really notice someone without a face. We're really programmed to notice and recognise faces... I feel if you don't have a face I can't really connect with you. Even when someone messages and they're really fun, I can't picture them in my head and that bothers me on a biological level. (Fitz, lesbian woman, MS)*

Twenty-seven participants (12M/13W/2NB) had rules about what age people they would date; 24 stated specific minimum and maximum ages they would consider dating, and therefore who they are likely to talk to on GSN apps (figure 7.6). Thematic analysis and figure 7.6 show there were no specific patterns by gender, age or area.

*Figure 7.6: Age participants would consider talking to on apps/dating – minimum and maximum age of potential dates (only including 24 participants who stated both a min and max age)*



All participants had their own personal age rules with some individuals saying they would talk to/date/potentially meet a wide range of ages (e.g. Robin, Akina, & Bernard), some preferred their own age and up (e.g. Phil, Steve and Belinda) and others preferred people a few years either side of their own age (e.g. Peter, Bridget and Alex). Although people's age preferences varied, most said they had app filters set to only see their preferred age or would ignore, not reply or reject swipe left (reject on Tinder) on any users outside of their age categories. Men talked about messages from older men as being "creepy" and suspicious, and some men stated on their profile they did not date "old men". A minority of men also talked about being worried about accidentally talking to or meeting people who lied about their age and were actually under 18; they were worried about the

legal implications of this. No women mentioned being worried about young people or older women being “creepy”; however, three bisexual women said they had different age preferences for men and women.

*I'm definitely an ageist, so someone has to have been in high school with me so either 3 years younger or three years older...I feel you have much more in common with the same age group. (Alex, lesbian woman, CT)*

*My range on HER [just women] is 25 to 40...And on Tinder [men and women] I have a range for my age [33] up to 40...Because normally boys that are younger than me are a lot younger than me mentally. And boys that are my age are also a lot younger than me mentally so I'm trying look for guys with a still good looking but with a brain [laughter]...I know that is a bad kind of generalisation, and maybe you can find a guy younger and still. But he is probably not on Tinder. [laughter] (Bridget, bi woman MS)*

No questions related directly to honesty or how people represented themselves on apps, however, two thirds of participants (8M/12W/1NB), brought up honesty and intentions unprompted. Participants said they tried to make sure they were upfront about what they were looking for on apps. For some participants this was being clear that they were looking for something casual and were not ready for a serious relationship, for others this was being honest that they were not just looking for hook-ups. This honesty enabled them to be considerate about other people's feelings and ensure there was no confusion. A minority of participants also made a point of making sure their profile photos were very realistic or that they were upfront about personal issues like mental health, gender identity, asexuality or disability. Some participants also felt it was important to be honest and upfront when they were not interested in someone, either on the app or after meeting up, to avoid hurting them.

*it's more common to meet someone who is not exactly on the same page as you...if I'm not going to invest emotionally, and this person seems emotionally investing in me, then it is my responsibility to let them know where I am at in the nicest possible way. And also perceptive of their needs (Soot, pan woman, CT)*

*So for like my gender I put woman, but in my profile I specify that I'm queer and non-binary. I also identify as aromantic I also put that in my profile so people know that I'm not kind of looking for romantic relationships...I'm uncomfortable...not letting people know that I don't want to have romantic relationships with them because I don't want them to perceive my intentions wrong. (Bailey, queer/pan non-binary person, CT)*

Another common safety strategy when using apps was to not to share too much personal information, for example not giving people their phone number or link to social media too quickly. This was a way to protect themselves and avoid potential harassment.

*Oh saying about security I use Kik. So when they say "have you got WhatsApp?", I'll be honest with them and say "yeah but I don't like giving my number out but I've got Kik" which is like WhatsApp but you don't have a number you're usually using... some have never heard of it and I go "oh it's dead good"...Because, I found this out, not all the time but it will depend on your settings on Facebook...if you put someone's mobile number in you can find them...I've done that where people have messaged me, cos I'm just like I'll go on and put their number in Facebook and be like "oh I can see your wife, I can see your kids"... (Bernard, gay man, MS)*

### 5b Safety when meeting people from GSN apps

Generally, women discussed more safety strategies when meeting up with people from GSN apps. The two main strategies were meeting in a public place and telling friends about their date. Most women (11W) felt it was important to arrange to meet their date for the first time in a public bar, café or restaurant; compared to five men who said they would usually or sometimes meet in a public place. Women were also more likely to tell a friend or family member where they were going (3M/7W/1NB). Some participants sent their date's photo and profile to their friends, but most people just told a friend the name of the bar and arranged to check in later. Women were more consistent with telling friends, whereas men said they sometimes did this but were not as steadfast.

*Oh no cos I knew and people told me, never give them your address, never go to either one's house, always meet the first couple of dates in a pub so if you felt icky you could always run away or something. Erm, so, yeah...I might just tell someone I'm meeting someone, it's always in a restaurant, in public and I have my own car so I wasn't ever fearful. (Barbara, gay/lesbian woman, CT)*

*I told my sisters where I was going, I sent them the address so they knew...No houses. And so like hotels, bars, restaurants. Oh, like just like a place that was public, open. I had a set amount of time that would spend with them. So I'd always message my sister "This is where I'm going today, this is the person's name and if I don't message you by 4 o'clock then ring me" (Courtney, gay woman, MS)*

Despite most lesbian women taking safety precautions when meeting people, all of the discussion about fear and violence was related to meeting men. A third of people (6M/4W/1NB; all women were plurisexual) talked about "murderers" or being killed or attacked on a date; the men usually talked in a jokey tone of voice but with genuine concern. Five people (3M/2W) discussed experiences of non-volitional sex with people they met on apps – although none attributed it to the app itself. A minority of men discussed friends who had been assaulted by men they met on apps or talked about stories they read in the media, specifically about violent men and Grindr.

*Oh you know, [men] might rape me or murder me, stalk me or put something in my drink or just be really creepy in general (Bailey, queer/pan non-binary person, CT)*

*I'm someone who always goes through the worst and best possible situation in my head all the time so much. Pretty much every time I go to meet someone [from an app] or someone's coming around to meet me I'm always thinking "is this when I'm gonna die?" [laughter] (Luffy, gay man, MS)*

*I feel very safe about it. And I don't know if that's because I'm just meeting women. And I think I would probably feel differently if I was meeting men on an app. Either as a gay man or as a straight person. (Emma, gay/lesbian woman, CT)*

A third of participants (6M/5W/1NB) felt they could trust their gut to tell them when another app user was suspicious or unsafe. Participants talked about sensing when things were "weird", having good intuition, perceiving the "vibe" or getting "strange feelings" about people. These intuitions were used to decide whom to meet in real life and, for a minority, when they met someone in person these feelings had led them to cut the date/hook-up short.

*I have really good intuition and I really trust it...So I just really trust my gut and sometimes it's hard for me to validate why because I might be like "I'm not being friends with that person" and then I'll look like a massive twat but then, like, you know, it will kind of work out. (Savana, bi woman, MS)*

*[meeting people alone] doesn't worry me. All I can do, is, like, shout or scream or call the police or, like, fight for myself. But what is the worst that could happen? If you sense or you feel something is not right...I don't go with that. Like, oh, there was one...I met up with someone and he wasn't the same on his picture and he was rich, you know but I just didn't have a nice feeling about the place...Yeah a kind of weird vibe about it and, like, even though he had just said "can we just wank and watch porn?" and I just said "no"...something not right I'm uncomfortable with the environment... (Yellow, gay man, MS)*

Other strategies reported by a minority of participants included doing online research or looking at social media of potential dates; talking to people for a bit longer to try to judge their trustworthiness; telling dates they had to leave at a certain time or having an exit plan; only having casual sex at their own house; being trained in martial arts, and having security cameras in their house.

*I don't go to other people's houses for stuff, never felt comfortable, always my house, my domain. It's much easier to kick someone out than to leave. I always felt more comfortable so that's definitely one that they come to my place...I'm a black belt so I never really felt like I had a personal safety problem, especially with women. I don't think women would hurt me. I don't think a woman would murder me or be out to get me. (Dee, bi woman, CT)*

*I'm like a detective, like, a lot of people, I have my Instagram linked to my profile so if they have theirs I'm going on Instagram and seeing who follows you, I'll see if we follow the same people or people that follow me follow you, going through every photo. I'll find you on Facebook if I have to, like, I've tried to do some work first. (Jesse, gay man, CT)*

## **5d Uninstalling or stopping using apps**

One of the most common coping strategies mentioned by participants was sometimes taking the decision to stop using or even uninstalling their GSN apps. Although the most common reason to deactivate apps was getting into a relationship (9M/7W), many participants deleted apps to protect their own mental wellbeing. A third of people (7M/5W/1NB) discussed how they had decided to delete an app after becoming annoyed with it, receiving negative and creepy comments, or becoming frustrated about how it made them feel. Some people discussed deleting apps as a reaction to specific experiences of harassment, usually from men, and some people said they needed "mental health breaks" from apps. Many people used apps in a cyclical way, downloading them and using for a while, getting frustrated or unhappy on apps, then having a break, just to come back to the apps a few weeks or months later and find they had a similar experience.

*me and everybody else that I like talk to about these things, have the same experience where we're on the app because we are lonely and either want something sexual or not or we're meeting somebody and then you get, like, disappointed or disrespected enough times to be like "fuck this, I'm deleting it" and just for enough time to forget and then you re-download it and then as soon as you go back you're like "oh my fucking god, why did I do this?"...(Akina, pan woman, CT)*

*Phil: I've had breaks from [apps] in the past, they usually last a couple of months or so, sometimes it lasts how long. Kind of on and off*

*Hannah: Breaks? What's prompted you to stop using it?*

*Phil: Men [laughter]...Nothing specific I just get tired of it, older guys constantly assuming I want to have sex with them (Phil, gay man, MS)*

### **5e Dating men versus dating women**

Most women talked about the differences between dating men and dating women; both in terms of how they interact in the app and how they approach meeting up in real life. All of the bi/pan/queer women (7W) who dated all genders felt men were generally more forward, creepy and threatening on all apps. Therefore, all the women who also dated men were much more guarded; some specifically set apps to exclude cis men and some said they would never meet up with a man from apps. All the women who used apps to meet men were much more cautious when meeting men and were more concerned about violence, threats and aggression from men. Some women talked in disbelief about what it must be like to feel safe to go to the house of a man they just met on an app, just to hook-up. A minority of the lesbian women (4W) compared their lack of concern or caution when meeting women to how scared they would be if they were meeting men.

*that's the difference that comes with men and women...I feel much more comfortable meeting women off of dating apps and therefore I've met more women off of dating apps...And with men, when they fuck up like that, it sucks cos you're, there needs to be some trust, for me, that I'm going to go and meet you out and you're not gonna fucking kill me or be aggressive or put me in a situation I don't want to be in. (Akina, pan woman, CT)*

*I don't think I'd meet a man through [apps]...Erm, again, me generalising but, like, predatory behaviour, just all those straight dudes seem to be twats...(Savana, bi woman, MS)*

### **7.3.6 Theme 6: Sexual health**

Sexual health was the theme with the biggest divergence between men and women and the only notable difference between geographical areas. Men were much more concerned and practiced safer sex than women; WSW felt their community was not concerned about sexual health and rarely used any protection. All five of the people who had never had a sexual health screen were based in MS. The sub-themes were *safer sex*, *HIV and PrEP*, *sexual health screening*, and; *health promotion on apps*.

#### **6a Safer sex**

There were significant differences between how genders approached safer sex, though no differences between areas. Reducing risk during sex between men was talked about by 14 of the 16 men. Although men were concerned about safer sex and talked about how they felt condom use was important, during the interviews it became clear that most men did not use condoms consistently with all partners. Five men reported they had condomless anal sex with regular partners because they knew the person well enough to trust they were sexually monogamous or were honest about their testing behaviour. A third of men (6M) discussed how they did not always use condoms with casual partners, however most of these did make informed decisions after judging their risk to be low (either they were on PrEP, did not have anal sex, or asked their partner about when

they were last tested). Only one participant discussed how condomless sex was accidental and he sometimes forgot to use condoms when drunk.

*For oral sex I don't use condoms. For anal sex I have, most of the time, the times I haven't, I'm trying to think, for hook-up. I don't think I've ever bottomed and not used a condom for someone I just met. I have topped not using a condom for someone I just met, cos the risk for me is lower and I know that I have been tested, or I was on PrEP for a time. So the risk is very very low for me. If they were willing to take that risk (George, gay man, CT – previously on PrEP)*

*Sam: Unless I was in a relationship like I don't think I would ever have sober sex with someone without protection...Everyone wants to not have an STD...Yeah I think on drunken one night stands it's just kind of...condoms are never the first thing on your mind whenever you're in another state.*

*Hannah: So do you think it's that you forget about them? Or that you just don't care?*

*Sam: Both. I think it's like you know, "are you safe?" "Yeah. Are you safe?" "yeah" ok. (Sam, homosexual man, MS)*

*Topher: if I'm getting intimate with somebody would we talk about putting on a condom?...yeah condom, always condom.*

*Hannah: is it done or is it talked about?*

*Topher: it's just done...I mean a couple of times it hasn't happened but...(Topher, gay man, CT)*

Most men felt confident to talk about condom use with casual partners; sometimes these conversations happened on the app before meeting up but usually they were had in person just before sex. For most, condom use would be expected; participants assumed condom use was a given unless an app user stated on their profile that they liked raw or bareback sex. Those on PrEP were the only participants who seemed to be more open to condomless anal sex and did not assume condom use was the default.

*for a hook-up I always ask "do you have condoms and lube". Or something like that. If they're coming to mine "have you got condoms and lube?" or "have I got condoms and lube?" or I'm going to theirs "I've got condoms and lube" or "have you got condoms and lube?" (Steve, gay man MS)*

*I think there's kind of a natural presumption if no one has specified like, "do not use condoms" So I think it's I think people like that who are more into like not using them will specify...well it has been talked about a few times but, mostly like it's just kind of assumed (Sam, homosexual man, MS)*

The topic of "barebacking" or "raw" sex was discussed by 11 men, and the one non-binary participant who used Grindr. Barebacking is different from other forms of unprotected sex as it is usually a deliberate decision not to use a condom to improve physical pleasure during anal sex. The acronym "BB" was included on one of the men's mock profiles which prompted some of the conversations. Nine participants (8M/1NB) talked about how they would actively avoid app profiles that mentioned "BB", or "raw" sex. Most participants interpreted an explicit statement about liking bareback sex as a suggestion an app user was risky and may expose them to HIV or STIs.

*Peter: no [this mock profile] is only about the sex and I want more information. This is only a sex date and I don't like that.*

*Hannah: The "BB" people use that as an abbreviation for bareback.*

*Peter: This is something I don't...and even mentioning that's just "no, turn off". (Peter, gay man, CT)*



*if I am looking for a hook-up when [a profile] say "bareback" I am like no. nope. And if I was looking for a hook-up I always ask "do you have condoms and lube". (Steve, gay man MS)*

Women were generally less concerned about safer sex. The only woman who did not discuss sexual health was asexual and was using apps to find a non-sexual romantic relationship with a woman. More than half of women (9W) discussed how they thought WSW usually assume sex between two women is not risky. Most acknowledged their denial and accepted that, yes, women could transmit STIs, but that generally they forgot about this or did not consider it when having sex or meeting female partners. Six women had never had a conversation with a female partner about safer sex and some participants questioned how risky unprotected sex between women was, as they did not know any information about STI prevalence or the physical risk of transmission.

*Hannah: do you ever worry about anything to do with like sexual health, STIs?*

*Mickey: I don't, which is probably really bad because we can get STIs [laughter]...but no I have never, never worried...Never used protection...no...I've never had a conversation with any sexual partners no (Mickey, lesbian women, MS)*

*oh my god having conversations people about dental dams and stuff like that and no one uses them, or knows about them or anything but why why? I am like, well I learned about it at school. Do you know what I mean? And I teach sex education as well. So we talk about these things. but a lot of people aren't aware, I suppose the chances are slimmer but if like I've ever spoke to someone I'm sleeping with "Have you been tested?", "no why?" And I'm like because sexually transmitted infection is real, "yeah but its not high risk is it?" Like but if you share in toys and you know, is it not transferrable like? (Courtney, gay woman, MS)*

Despite many women acknowledging a lack of concern about safer sex amongst WSW, some (6W/1NB) did report safer sex behaviour, although this was only occasional. The most common of these related to using condoms on sex toys, washing sex toys or not using a toy on more than one partner during sex session. Barrier protection during skin-to-skin contact was very rare; only two women reported ever having used dental dams for oral sex (2W) and two participants (1W/1NB) reported ever using latex gloves.

*I think like, the thing that people are careful about is like sharing toys. But yeah, dental dams. I feel like, it's...show me data proving that it makes me any, like...any significant percentage safer and I would consider using it. Like, but I don't really see how that would be an effective barrier given how I have sex...it doesn't make any kind of seal. Like, I don't think that it's like I don't see like oral sex as like one, like I would probably be using like seven [dental dams]. I don't know...like I feel like sex is more like creative or something with women. (Emma, gay/lesbian woman, CT)*

*[sighing noise] I have brought [dental dams] up and they have always gone "no". I'm here so I will just go...I've done all the things like other stuff like condoms on toys I have also used a condom on my hand, as mad as that sounds. This is one of those things where I kind of like spin and go like "oh, it's got lube on so it will be useful" so it's like I kind of find another way like the other benefits. (Natalie, lesbian woman, MS)*

Of the eight plurisexual women and non-binary people, most (5W) talked about how they were more concerned about sexual health and practised safer sex when with men, compared to women. These women would insist on condoms when they had sex with men, and some were on the contraceptive pill; safer sex was the norm



with male partners. However, most also talked about how they had a different, more relaxed approach to safer sex with women rarely using any barrier methods or discussing sexual health screening.

*I always bring my own a condom because I don't wanna be left in a position where I have to make a decision or, you know, that kind of thing. So yeah, I definitely always come prepared myself. I guess I do think about it, erm, and prepare myself accordingly. With women, not so much but I'm aware of my surroundings and, you know, I don't know, I, I guess I don't really ask questions to women but it depends, having sex with another women is different every time (Akina, pan woman, CT)*

*Dee: I always brought [safer sex] up. After that point [when diagnosed with an STI] I always brought it up. I always asked if they were tested. It didn't always stop me from proceeding but I always asked.*

*Hannah: And women as well?*

*Dee: Yeah, er, no. I never asked women actually (Dee, bi woman, CT)*

## **6b HIV and PrEP (men and non-binary Grindr user)**

HIV and PrEP were discussed by most men and the non-binary Grindr user (14M/1NB). Fear of contracting HIV was an underlying reason alluded to by most men when talking about condom use during hook-ups. Grindr allows users to put their HIV status and last test date on their profile. Eight men discussed how they thought this was beneficial as it was good to see people's status and whether they were taking PrEP. However, all of these men said although they liked the have this information upfront, they would not necessarily trust the profile information as app users may lie. These men would insist on using condoms no matter what the profile said about HIV status, however putting status on profiles was at least starting the conversation and bringing up the subject of HIV.

*I think it's a good thing [Grindr says HIV status]. Will I trust to HIV status? No, you could just lie to me. But I guess it's a little comforting that it is there. (Jammal, gay man, CT)*

*I think it is a good thing [profiles state HIV status] but you can never be sure. People could be lying. If some people says they are HIV positive, so they have AIDS they have the virus, I would not go on a date. That is true, I have never admitted that to somebody but that is true. (Peter, gay man, CT)*

Three men discussed how they would actively avoid sex with someone who was HIV positive because they feared contracting the virus, two men were concerned this made them sound prejudice. The two men on PrEP both discussed having sex with HIV positive men since they had started taking PrEP and not being concerned as their medication protected them and most HIV positive partners had an undetectable viral load.

*I've slept with a guy who, he's HIV positive but he's got an undetectable viral load and I did bareback with him because I was, like, "well I'm on PrEP, and I've met him a couple of times"... (Bernard, gay man, MS)*

*I don't want to sound like an asshole...I wouldn't want to do anything with someone confirmed [HIV positive]. Because I wouldn't want to risk catching it. Like I still talk to them if they message me, I wouldn't be a dick about it, but I'd just be worried. It's a permanent condition. Maybe once there was proper treatment for it not just prevention, then I'd be a bit more... like once it's gone down to the same level as like gonorrhoea (Phil, gay man, MS)*

PrEP was discussed in 15 interviews (15M/1NB). Two thirds of participants (9M/1NB) discussed the importance of PrEP as a drug and were glad that some Grindr users put it on their profile as it encouraged openness, and brought up sexual health early on. Some men compared it to birth control pills and felt it added an extra layer of protection. Opinion of app users who used PrEP was divided: a minority of participants (4M) discussed how they would actively avoid profiles that stated PrEP use as they considered taking the drug as a sign this person was engaging in a lot of risky sex; three participants (3M) were concerned about STI risk and PrEP, and; 5 participants perceived Grindr users on PrEP positively as it suggested that person was knowledgeable about sexual health and therefore more safe.

*So it's like, if you had to go on PrEP, what are you doing with whom? And how often are you doing it? I'm sure it's probably very stereotypical but when I think of PrEP I think of like, people with very high risk lifestyles. So are you like prostitution? Stripping? Or you like sleeping casually very often? Like what exactly are you, just like mostly strangers not people you know. Why PrEP what's going on? PrEP is a beautiful thing, maybe you should be on PrEP, but it gives me a gives me a sign of your lifestyle. (Jammal, gay man, CT)*

*Generally if [PrEP is] on a profile it means, well to me at least it means they're less fussed about getting tested. Which is not a good thing in my book. It also means that they used to frequent sex, potentially with multiple people which is also a big eugh...if you're just doing the odd hook-up now and then you wouldn't really need to get on PrEP. But that's just my opinion (Phil, gay man, MS)*

Five participants (4M/1NB) discussed how they did not know much about PrEP or they stated incorrect information showing confusion about PrEP, how the drug worked or how the UK trial is implemented (at time of interviews in England PrEP could only be accessed through the Impact Trial and participants have STI tests every three months). Two participants (1M/1NB – both MS) discussed wanting to go on PrEP but being unsure how to get it.

*no cos I thought PrEP, before I looked it up, I thought it was actually medication to suppress HIV, like they had HIV...so I was always very much like if I saw anyone on PrEP, I'd be like "oh god no they've already got it, I'm not risking it"...yeah absolutely I'm considerably ignorant (Lollipop, bi/pan man, MS)*

Two participants (1M CT/1M MS) were currently on PrEP and one man (CT) had previously taken PrEP but stopped for medical reasons. All three preferred to use condoms during sex but they were more willing to engage in condomless sex when they were on PrEP. All of them had the information on their Grindr profile and the two current users had experienced stigma and negative comments about using PrEP.

*you get that thing with the Daily Mail "why should our tax ...?" and I say to people well "why should my tax money pay for women to have contraception? Why can't they just use a condom?" ...a lot of people are like "yeah but you should just use a condom" and I'm like "yeah, I use them" well, I use them sometimes...cos I'm like, the amount of times you go "what have I just done?" It's that extra layer of protection." (Bernard, gay man, MS – currently on PrEP)*

*when I first started [taking PrEP], my friends were calling me "Truvada whore", "PrEP pill popper"...Well everyone was pretty much, like, "everyone only takes this pill so they can have raw bareback sex" and I'm like "it's not like that", I mean the occasionally yeah, slip up, who knows but you're not gonna suck a dick with a condom on, it's so 1981, you could get it from giving somebody a*

*rim job, you can get HIV from swallowing a load, you know, if you've flossed that day and your gums are open. (Jesse, gay man, CT – currently on PrEP)*

### 6c Sexual health screening

Most participants (14M/12W/2NB) were asked directly about their uptake of sexual health screening. Screening uptake seemed to be higher in CT and higher in men. Men tested more regularly than women; with most saying they had a sexual health screen between one and four times a year. Five participants (2M/2W/1NB) discussed only having ever had one sexual health test and for most, this was a chlamydia test at a college or youth service. All participants who had never had a sexual health screen were from Merseyside (2M/3W); the two men were scared of looking ignorant at the clinic and ashamed about not having been tested before and the three women felt it was not relevant to them because they only had sex with women or used condoms with men. Connecticut participants who had been for sexual health screening had it covered by their health insurance or went to a Planned Parenthood clinic (free or affordable care). In the UK, most sexual health screens were done at a genitourinary clinic or as part of a chlamydia screening programme.

*I don't know. I think it's just feel really insecure about [going for screening]. And you can spot my ignorance and having to go somewhere and then be questioned. I think it's about not understanding the questions. Not wanting to ask. (Aurelio, gay man, MS)*

*Yeah, I usually get the minimum every three months. I tell my doctor when I go to test everything; HIV, gonorrhoea, syphilis, chlamydia. Herpes I ask for every time the most doctors don't or won't give you that test every time. (George, gay man, CT)*

Of those who were asked directly (9M), only two men had talked about app use with a sexual health service or medical professionals, these had come up during discussions about sexual history; most (7M) had never discussed using apps during a sexual health screen. Opinion was divided on whether health professionals should ask about apps or where they met sexual partners; four men thought they probably do not need to ask as number of partners and condom use were the most important issues. Three men discussed how they thought it would be good to talk about apps use during a sexual health screen as it would be useful if there was an STI outbreak or they would welcome advice on how to stay safe on apps.

*Hannah: when you go and have screening, do you ever get asked any questions about apps or, like, where you meet people?*

*Jesse: Not really. Like when I go for my, every six month check-up, annual, they're basically just asking me "are you sexually active, how many partners have you had since the last time we visited you, are you using protection?" and stuff like that. I feel like [they should be asking], because there's a lot of fucking danger in these apps too. (Jesse, gay man, CT)*

*[sexual health services asking about app use] could be a bit of an intrusion of privacy maybe, but equally I mean, especially for gay man, I know that it might be like if there's a trend that maybe, 80% of men who have contracted an STI have met on Tinder and not Grindr, maybe that that could be a good way of addressing the health of that population. But again, I don't know if they should have the right to ask that or not. Maybe it'd be a good right optional thing...(Sam, homosexual man, MS)*

### 6d Health promotion on apps (men and non-binary Grindr user)

Thirteen participants (12M/1NB) were asked direct questions about health promotion adverts on GSN apps. This question was only asked to men, and to the non-binary participant who used Grindr, as none of the main apps used by women has the facility for commercial adverts or health promotion. Most participants had seen health promotion adverts on apps; some on Grindr and some on Scruff. However, the health promotion adverts tended to be lost amongst adverts for other smartphone apps, games, clothes or events. Most people could not recall the exact topic of the adverts but said they were maybe sexual health screening or safer sex.

*Hannah: Do you ever see anything to do with health pop up on Grindr?*

*Sam: Yeah, it's actually got quite good recently and I think the whoever organises it, and there's been more erm. I can't think of any specific ones come to my mind, but there's been more like awareness campaigns and stuff about them (Sam, homosexual man, MS)*

*No. It's always for solitaire games where you can win cash. There's Tune Blast, photo editing ads, it's all ad space for other people that are trying to promote their apps...On Scruff every once in a while there's, like, a little tool bar ad that will pop up at the bottom and you'll see something for PrEP there. but, not that I can remember [on Grindr]. (Jesse, gay man, CT)*

Three participants said they had never seen pop-ups on apps advertising anything sexual health related; one of these participants had never used Grindr, one paid for premium-ad free Grindr and the other couldn't recall sexual health ads but had seen an advert about respectful behaviour on Grindr. Although the majority of people could recall seeing such adverts half of men said they ignore the adverts as they find them irritating, intrusive or they feel they are not personally susceptible to advertising.

*I just see ads come up, come through and I just delete them. I don't read them...I almost feel like they're viruses. I just think no. I'm good with that...we have seen enough commercials we are done with commercials. (Topher, gay man, CT)*

*if I ever seen an advert I click off it straight away. I'm don't think I am very receptive to adverts, On TV I've never watched adverts. I'm not a good capitalist, I'm never buying anything [laughter] Yeah I have seen things but I don't think they really register with me. (Aurelio, gay man, MS)*

Despite so many participants saying they ignore adverts, the majority did still think men's GSN apps were a good place to advertise sexual health and target health interventions. Some also felt men's apps needed to take responsibility for promoting safer sex and reducing STIs/HIV. Others discussed how apps, like Grindr, were the perfect place for adverts about safer sex as when you're browsing or arranging a hook-up, the adverts would remind men to practice safer sex, this could either be in a direct way or through more subliminal advertising. Adverts with timers that forced users to spend time reading it before shutting were suggested to be most effective.

*well I think Grindr needed to do [sexual health ads] because I think Grindr really promoted, anonymous hook-ups and I think, Grindr is probably responsible for the spreading of, I shouldn't say "responsible" but, because of Grindr a lot of STDs were probably dispersed. So I think Grindr is doing the right thing by putting that. (Topher, gay man, CT)*

*People spend their time [on apps] they are looking at it so, you know, you can grab their eyes, if you grab their attention, even if just for a bit then maybe it's good for advertising...And if they want to engage a bit more then probably yeah they will do it more. (Yellow, gay man, MS)*

### **Reflection box 7.1: Sexual health questions in general interviews**

I struggled to bring up sexual health issues naturally in some of the interviews. I have conducted lots of research projects on sexual health, talking to a wide variety of young people and adults about contraception, HIV and sexual risk-taking behaviour etc. (Cook and Madden, 2011; Madden, 2011; Madden et al., 2014; Madden, 2014). I am confident in my skills to stop it being awkward; I pride myself on my ability to encourage people to feel relaxed enough to discuss even the most personal and embarrassing topics. However, some of these interviews felt difficult; for some it was a challenge to move the general conversation to sexual health. Some of these changes in topics felt a little uneven and jarring. I think this is because for many participants the topic of sex was only a part of the conversation and most of the interview focused on serious and emotional topics like love, mental health, friends, body image, identity or other casual behaviour.

The men who used apps mainly for casual sex (e.g. Jesse, Sam, George, Lollipop, Bernard) talked about sex from the start of the interview and the conversation moved very easily to more in-depth discussions of condoms and risk-taking behaviour. However, for men who used apps for dating or to find more serious relationships (e.g. Topher, Sebastian, Aurelio) it was harder to move the conversation from romance to sex.

For interviews with WSW, these conversations were particularly hard because only a couple of women were using the apps to find casual sex partners so very few women brought up sex before I did. WSW are not as accustomed to talking about sexual health as MSM; WSW are less likely to use sexual health clinics and WSW are largely absent from public health research and health promotion (Boehmer, 2002; Power et al., 2009). This combines with the heteronormative narratives which often talk of sex between women as not "real" sex (Power et al., 2009) and leaves many WSW out of the conversations, and thus research, about sexual health.

In my previous research, sexual health has usually been the main topic of the interviews, typically introduced after the normal admin and general opening questions at the start. For this study I think because we were talking about such broad topics, it was hard to get into the nitty gritty of condom use, numbers of partners etc within a 1.30hr long interview.

The fact I was the person to bring up sex in a lot of the interviews shows that sex, and thus sexual health, is just not at the forefront for most people who use GSN apps. Most apps research focuses on sex, but for a large proportion of people I interviewed, sex was not at the forefront of their mind when they use apps.

## 7.4 Discussion

This study adds to the current evidence base on health impacts of LGBTQ+ GSN apps, which is mainly from the USA, uses quantitative methodologies and focuses on MSM. To my knowledge, this is the first qualitative study to include multiple genders (n=33; 17 men, 16 women and 2 non-binary participants), and shows many common experiences between genders. The main differences between genders related to sex, sexual health, discrimination and racism on apps, requests from male/female couples for threesomes and the fear women feel of men. The findings of this study provide new evidence, previously not present in the literature, on positive impacts on health, how socioecological factors influence health and the measures users already take to protect their health when using GSN apps. Previous research has focused primarily on sexual behaviour and sexual health outcomes of apps users, however for most participants sex and sexual health were only part of picture. For many, sex was not the main reason, outcome, risk or influence on their behaviour and some interviewees were almost reluctant to talk about sex as it was not an important part of their app use (see reflection box 7.1). This study also adds to the evidence base by highlighting other areas that require further study, away from a narrow focus on sex.

### 7.4.1 Differences between groups

#### 7.4.1.1 Findings in Connecticut and Merseyside

To the best of my knowledge, this is also the first qualitative study to compare experiences of GSN app use in two countries. Impacts on health, influences on behaviour and strategies of app use were very similar between the two areas; women in CT had similar experiences to women in MS, and men in CT had similar experiences to men in MS. The only notable difference between the two areas was that all five participants who had never had an STI test were in MS. However, with a relatively small qualitative sample this may be due to the demographics of the MS participants (lower mean age and slightly higher proportion of students than in CT) or the recruitment methods (snowballing in CT meant most participants were highly educated). The only other difference was that a higher proportion of participants in CT identified as plurisexual or were using apps to meet partners of all genders (CT 27%, MS 19%), most of them women. Again, with a small qualitative sample this may be coincidence or due to sampling.

There were no other notable differences between the experiences of participants in the two areas. Therefore, we can likely conclude that previous research conducted in liberal and metropolitan areas of the USA, such as Connecticut, may be generalisable to the UK.

#### 7.4.1.2 Gender and sexual health

In terms of gender, the biggest difference between men and women related to sex and sexual health. A higher proportion of men interviewed were using apps to meet casual sex partners, and men were more likely to arrange to hook-up without a date or any pre-meeting. The women who discussed using apps for casual sex stated they would meet for a drink beforehand and never just go to a women's (or man's) house for a hook-up. In the general population, men have more sexual partners and MSM report more sexual partners than WSW (Mercer et al., 2013; Mercer et al., 2016).

Men practiced more safer sex than WSW. However, condom use was inconsistent; most men did talk about some instances when they had not used condoms or possible circumstances when they would not use them. Most men stated they actively avoided app profiles mentioning bareback or “raw sex” as they were thought to be high risk. Previous research has shown mixed results with regards to GSN app users having higher numbers of sexual partners and inconsistent condom use with casual partners (Rice et al., 2012; Holloway et al., 2015; Choi et al., 2017; Goedel et al., 2017c; Badal, 2018; Duncan et al., 2018b). This may explain some of the evidence of higher STI rates in app-using MSM (Beymer et al., 2014; Chan et al., 2018; O'Connor et al., 2018); however, cause and effect cannot be determined. Women discussed sex in less detail, fewer had had STI tests; most said their use of barrier methods was rare as they saw sex between women as low risk. Research from the UK and the USA has consistently shown WSW are not very concerned about contracting STIs and rarely use barrier methods during sex with women (Bailey et al., 2003; Marrazzo et al., 2005; Richters et al., 2010). WSW may not feel at risk of STIs because they are seldom included in sexual health promotion, government policy and general conversations about sex (Power et al., 2009; Formby, 2011). However, only promoting dental dams at lesbians may add to the pathologisation and *othering* of sex between two women; dental dams are not promoted to heterosexuals and oral sex performed by a man on a woman is usually viewed as a “low-risk” activity (Clarke et al., 2010).

Some of the participants who had never had an STI test reported a high number of sexual partners met through apps. For men the main reason they had never had a test was because they were nervous to attend a sexual health clinic, for the women it tended to be because they did not feel themselves at risk. Health promotion needs to ensure that app users of all genders know the risks, how to get tested and allay fears of attending clinics for the first time. From a public health perspective consistent use of barrier methods and regular sexual health screening are the best way to reduce risk of STIs and HIV. These findings show these messages need to be reinforced with GSN app users. The apps themselves may provide opportunities to do this, however, only men’s apps (such as Grindr and Scruff) sell adverts and allow for sexual health promotion. Very few GSN apps include any information or advice about sexual health; those that do tend to be aimed at MSM and no WSW apps included any (Huang et al., 2016b). Most men in this study had seen health promotion ads on apps but could not remember specifics and felt health messages got lost amongst general ads. Most men said they ignored all ads, including sexual health ads, and felt they were less susceptible to advertising than others. However, generally people think advertising does not influence them despite the multi-billion pound industry demonstrating that it does (Fennis and Stroebe, 2015).

Despite this, many men suggested GSN apps were a good place to provide health promotion as it reminded users about safer sex when they were arranging hook-ups. Therefore, health promotion on MSM apps is likely to be appropriate and beneficial. There is an emerging evidence base suggesting that MSM GSN apps may be an applicable channel for health promotion, outreach and sexual health services; however, evidence of effectiveness is mixed and there are ethical issues and practical barriers when providing such services (Holloway et al., 2014b; Sun et al., 2015; Fantus et al., 2017; Ventuneac et al., 2018). Research into GSN app-based interventions is still new and very little of it links with behaviour change theories. Interventions would need to help GSN app users develop the capacity, opportunity or motivation to change behaviour (Michie et al., 2014).



There is no research on GSN app-based health promotion for WSW and further research is needed to understand the acceptability and efficacy of this.

#### **7.4.1.3 Gender and personal safety**

LGB people are at increased risk of experiencing interpersonal violence and hate crimes (Roberts et al., 2010; Institute of Medicine, 2011; Katz-Wise and Hyde, 2012). Women in this study were more scared, cautious and took more precautions than men. These safety measures were especially important for plurisexual women when they met men from apps. Research with bisexual women in New Zealand who use Tinder found many had experienced stalking, catfishing and sexual coercion, though only when interacting with heterosexual men (Pond and Farvid, 2017). This victimization and danger from men was seen as an unavoidable risk of using Tinder and this had led women to stop interacting with all men on Tinder; a decision echoed by some of the plurisexual women in this present study. Despite most lesbian women taking safety precautions when meeting people, the discussions about fear and violence all related to meeting men and lesbian women saw themselves at lower risk.

There have been well-publicised cases of violence and crime initiated through GSN apps (Simmons, 2016; BBC News, 2019) and previous research showed MSM were concerned about physical safety, violence or sexual coercion perpetrated by people they meet on GSN apps (Miller, 2015; Albury and Byron, 2016; Macapagal et al., 2016; White Hughto et al., 2017; Lauckner et al., 2019). Although some men reported friends who had experienced violence or theft after a GSN app hook-up when they talked about violence it tended to be jokes about potential “murderers”. Only a minority of men said they would always meet in a public space. Health promotion messages need to ensure people are vigilant of their surroundings, let friends know where they are going and meet in a public place if possible.

#### **7.4.2 Benefits of GSN app use and reasons for use**

Participants reported using apps for different reasons, either at different times or concurrently. These reasons had both changed over time and/or the reasons were concurrent. This variety of motivations confirms previous research showing MSM use GSN apps for; friendship and platonic social relationships; entertainment, “killing time” or using when bored; romantic relationships, love or looking for a boyfriend; casual dating or non-serious romantic relationships; connection to a gay community and networking, and; psychological and social inclusion such as reducing loneliness or self-esteem boosts. Although Tinder has a reputation for being a site for hook-ups, similar to research with Dutch heterosexual women (Sumter et al., 2017) and bisexual women in New Zealand (Pond and Farvid, 2017), WSW in this study are mainly using it to find dates or relationships.

Participants of all genders in both countries were looking for, and finding, community, companionship, romance and love. Apps were reported as having a positive impact on mental health (boosting self-esteem, providing access to a community and reducing loneliness), as well as facilitating easier access to potential romantic and sexual partners. Substantial evidence shows LGB people in the UK and the USA experience worse physical and mental health than the general population (Meyer, 2003; King et al., 2008; Institute of Medicine, 2011), although social support, friendships and social cohesion can improve health (Berkman, 2000; Mulvaney-Day et al., 2007; Gruenewald and Seeman, 2010; Ikeda and Kawachi, 2010). Social cohesion and being connected to

a LGBTQ+ community is linked to better self-efficacy, lower depression symptomology, improved self-esteem and long-term health outcomes for LGB people (Detrie and Lease, 2007; Heath and Mulligan, 2008; Doty et al., 2010; Gibbs and Rice, 2016). This connection to a supportive LGBTQ+ community is also associated with lower internalised homonegativity which can reduce minority stress and improve both physical and mental health (Meyer, 2003; Newcomb and Mustanski, 2010; Lick et al., 2013; Hill and Gunderson, 2015). GSN apps have potential to increase social capital and improve social cohesion for users. Further research is needed to investigate how the social support and social cohesion facilitated through apps can be maximised to reduce health inequalities.

The variety and extent of positive health and social outcomes is one of the key novel contributions of this study. Participant's motivations for using apps and the positive outcomes reported were very similar, and most participants talked about these interchangeably. People were generally finding what they were looking for and then repeating the experiences. The main exception to this was making good friends with people they met on apps, for most this appeared to be more of a by-product of app use, rather than an explicit aim.

Sex was both an important reason to use apps and a significant outcome of app use for men, however, it was not the sole purpose or only positive outcome for any participants in this study. Previous research on how LGBTQ+ people use apps has focused almost exclusively on sexual activity, sexual health outcomes and sexual risk-taking behaviour by MSM (Choi et al., 2017; Zou and Fan, 2017; Wang et al., 2018), however no other research has studied apps with a sex positive approach looking at good sex and pleasure as a benefit to users. This ignores the health benefits of sexual activity and risks alienating app users if all health discussions and promotion are judgemental or sex-negative in tone. Apps are no longer a new or novel technology; evidence shows use of apps is very common in MSM. The technology is here to stay and LGBTQ+ people will continue to make sexual connections via such apps. Focusing exclusively on negative outcomes may further stigmatise a community that already suffers from considerable discrimination and heterosexism (Institute of Medicine, 2011; Farvid, 2015).

### **7.4.3 Negative health impacts and risks to health**

All participants reported both benefits and negative outcomes or experiences of using apps. There were some substantial differences between men and women (see section 7.4.1). Participants of all genders reported rejection having a negative impact on their self-esteem and self-worth. However, for a minority (all men) this was much more serious with participants receiving abusive and insulting messages about their looks rather than just being ignored or rejected.

For men, and women who dated men, there was a feeling apps were too focused on sex, at the expense of deeper connections, prioritising physical appearance and encouraging judgmental "swiping". People of all sexual orientations and genders who use online dating and GSN apps use metaphors relating to markets, objectification and consumerism such as "meat market" and "shopping" (Bonilla-Zorita et al., 2020) and young black MSM in the US report the sexually graphic material on social networking technology contributes to the sex-focus of interpersonal relationships (LeGrand et al., 2014). The design of apps such as Grindr encourages instantaneous and ephemeral relationships (Yeo and Fung, 2016), and experiences of dehumanisation and objectification of

users is a reason MSM in the USA choose to delete Grindr (Brubaker et al., 2016). The image-focus of apps was thought to reflect the gay scene in real life and was only amplified by the design of apps, which places photographs at the forefront and gives priority to visuals over text. However, in this study few women who only dated women were concerned about the sex focus of apps. Body image was an important issue for men impacting on how they felt about their looks and witnessing body-shaming on apps (e.g. profiles stating “no fat guys”). This was not an issue for most women.

Meta-analysis conducted before the widespread use of GSN apps shows gay men are slightly more vulnerable to body dissatisfaction than heterosexual men, though no differences were found between lesbian and heterosexual women (Morrison et al., 2004). Recent research shows sexual minority men are more likely to report clinical eating disorders and disordered eating (Matthews-Ewald et al., 2014; Calzo et al., 2017) and both sexual minority men and women are more likely to be on a diet (Matthews-Ewald et al., 2014). Qualitative research with Grindr users in Canada found GSN affect body image through weight stigma, objectification and social comparison and reinforces hierarchies in terms of masculinities and physical appearance with young, white, slim and muscular men being the most desirable (Filice et al., 2019; Numer et al., 2019). MSM in the UK have reported similar experiences - interviews with Grindr users in Newcastle-upon-Tyne found they constructed their profiles to accentuate their masculinity and attractiveness, buying into the commodification on the app and hierarchy of users, acknowledging that “sex sells” (Bonner-Thompson, 2017).

A minority of men in this study explicitly acknowledged hierarchies and the value placed on attractiveness, discussing how apps, especially Grindr, can be a competitive and judgemental space. Previous research in this area has focused on sociological or societal impacts, this study is the first time such negative statements have been linked to health in research with British MSM. Heterosexist profiles requesting “straight acting”, “masc[uline] only” or “no camp” were interpreted as judgmental, homophobic and discriminatory and made some participants very angry. Previous research has shown MSM app profiles with language and photographs that display hegemonic or overt masculinity are seen as higher value and more desirable (Penney, 2014; Numer et al., 2019). In line with *intraminority gay community stress theory* (Pachankis et al., 2020), witnessing homonegativity and discriminatory statements from within their own community is likely to add to MSM’s experiences of minority stress and potentially exacerbate health inequalities.

Almost all men interviewed had witnessed statements about ethnicity on profiles; mainly stating “white guys only” or even “no blacks” or “no Asians”. This has also been demonstrated in research with app-using MSM in many other global contexts (Callander et al., 2016; Shield, 2018; Lauckner et al., 2019; Numer et al., 2019; Thai, 2020). Such statements were interpreted by some as explicit racism and others as just stating a preference. The phrasing of such statements was key; positive (e.g. “I like white guys”) compared to exclusionary tone (e.g. “I don’t like Asian guys”). Although “personal preference” is often used by MSM in online spaces to excuse discriminatory behaviour (Wade and Harper, 2020), such preferences can be categorised as racialised sexual discrimination, which have a negative impact on the health of BAME users (Wade and Harper, 2020). Experience of race-based sexual discrimination is associated with lower self-esteem and lower life satisfaction in BAME Grindr users (Thai, 2020), and correlated with depression, anxiety, and stress in a general sample of MSM of

colour (Bhambhani et al., 2020). Some apps allow users to filter profiles by ethnicity, which is likely to exacerbate and normalise racialised sexual discrimination. Without the apps, especially Grindr, changing the functions of their app, or limiting what people can say in profiles about preferences this is unlikely to change. Without systemic change within app designs there is a need to build resilience for those affected. There is also a need for advocacy and campaigning to change these systems – however without app users demanding change or withdrawing their custom, the apps are unlikely to make these changes (see reflection box 9.2 for discussion of apps as profit making institutions).

Qualitative research with MSM has found widespread experience of discrimination, harassment, insults or bullying on apps (Lauckner et al., 2019; Numer et al., 2019). Some participants in this study felt users of apps, especially men, were more blunt or cruel than they would be in face-to-face interactions. The anonymous nature of the internet leads people to be more open, less restrained and more open with their opinions, known as the online disinhibition effect (Suler, 2004). Whilst this can be a positive, allowing people to be more honest and share personal information, for others it can lead to rude language, harsh criticism, anger or harassment. Users of GSN apps are also likely to show this disinhibited behaviour, which may feel even harsher when experienced in an arena where users are trying to find intimacy or love.

The negative experiences of apps and perceived risks to health were more pronounced and widespread for men in this study. However, women did experience some difficulties the most common being rejection and subsequent self-esteem harm (as discussed above). The other issue reported by women was frustration at the ubiquity of requests for threesome from mixed sex couples ("magic unicorn hunters"). Although Tinder policies explicitly ban couple profiles (Tinder, 2020), governance mechanisms fail to reduce predatory or deceptive users, which leads to some WSW feeling unwelcome and unsafe on Tinder (Duguay et al., 2020). The limited research shows WSW are commonly approached by mixed-sex couples on GSN apps and create profiles that indicated their lack of interest in heterosexual couples (Ferris and Duguay, 2020). Popular media also presents this as a common experience for WSW on GSN apps, with it being a particular problem for bisexual women on Tinder (Lindsay, 2018; O'Hara, 2019; Vetter, 2019). This study is the first research to demonstrate this is an issue for British and American WSW, with all Tinder users reporting seeing such requests. Further research is needed to explore the impact of this on women's health, self-esteem or dating habits.

#### **7.4.4 Balancing risks and benefits**

Most of the positive health impacts also had a negative flipside, and sometimes these were reported by the same person. The sub-themes in theme 4 (negatives & risks) aligned as opposites of the sub-themes in theme 3 (positives & benefits); *for every Yin there was a Yang*. For example, whilst two thirds of participants felt apps improved their self-esteem, two thirds also discussed how apps damaged their self-esteem; half of participants reported experiencing both boosts and damage to their egos. Participants found apps allowed them easier access to a wider range of potential partners; however, this came with experiences of rejection. Many people had found a community, friendship and social support on apps, but many, mainly men had experienced discrimination, offensive behaviour or homonegativity from strangers on apps. Sex and pleasure were a benefit

and motivator for men, but many other men felt apps were too focused on sex, physical appearance or short-term sexual connections.

Given the many negative impacts and perceived risks of using apps, especially for men, it could be asked why participants are still using them. Many individual-level health behaviour theories (including Health Belief Model, Theory of Reasoned Action, Theory of Planned Behaviour, Social Cognitive Theory and Transtheoretical Model) all include reference to attitudinal beliefs and how individuals make appraisal of the expected positive and negative outcome of a behaviour (Noar and Zimmerman, 2005). For someone to do something they have to effectively conclude the positive aspects of a behaviour outweigh the negative aspects. We can conclude that although participants in this study report many negative outcomes of their app use, these must be outweighed by the positives otherwise people would stop using them altogether. The previous research on GSN apps that have focused on negatives ignores this pay off and the informed decisions users make about their use.

Resilience was a key issue discussed by two third of participants and participants felt they needed a “thick skin” and had to ensure they did not internalise some of the negative psychological impacts of apps. People with high resilience are able to adapt to situations, withstand stress and thrive in the face of adversity (Hill and Gunderson, 2015; Meyer, 2015). Although some participants were no longer using apps, this was usually because they had either started a serious relationship or they were going to be moving locations. Only one participant (a man in CT) had stopped using apps entirely because he did not like them. Nearly half of participants discussed how they had an unhealthy relationship with apps; for men this tended to be because they were addictive and women felt apps had become a psychological crutch they used to boost their self-esteem. The evidence on the “addictiveness” of online dating and GSN apps is inconclusive, though higher sensation seeking and sexual permissiveness are associated with using GSN apps/websites to find casual partners (Bonilla-Zorita et al., 2020). Further research is needed to understand how resilience can be improved and utilised to develop public health interventions that promote such resilience could reduce these negative health consequences of GSN apps.

#### **7.4.5 Influences on how people use GSN apps**

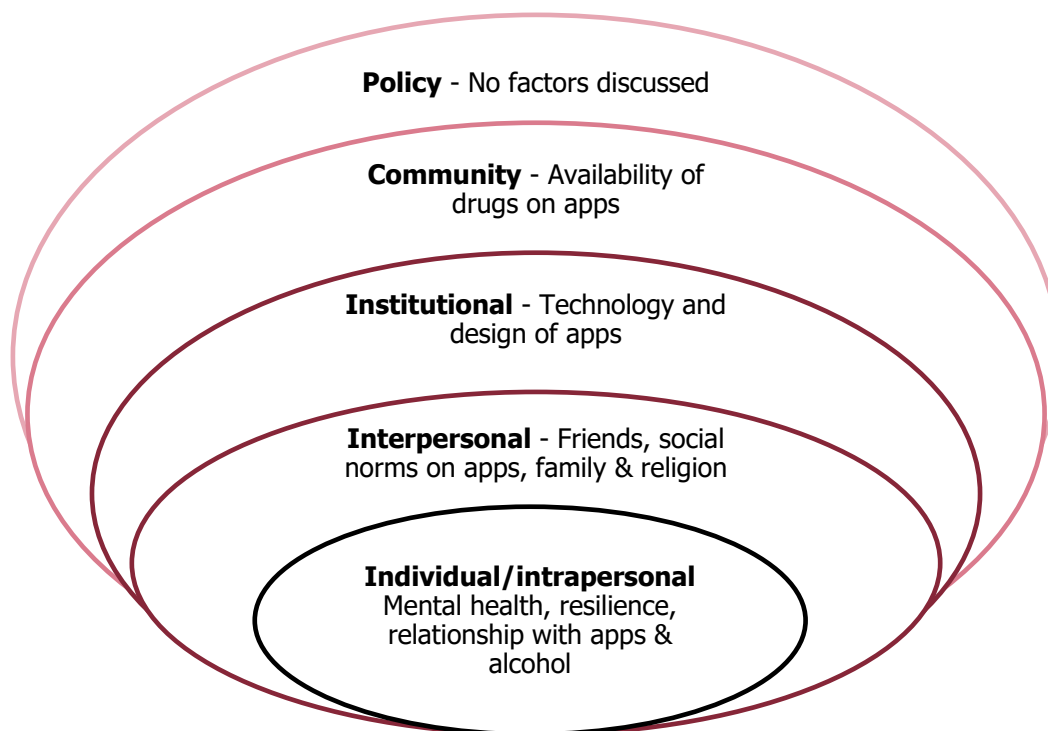
Influences on behaviour and health will be discussed within the socio-ecological model (SEM) of health (figure 7.7); this provides a context to understand how interventions might influence behaviour and reduce risk (Bronfenbrenner, 1977; McLeroy et al., 1988). The influences discussed in this section are interactive; effective population health interventions must consider individual behaviour and the complex environments and systems in which they operate (Golden and Earp, 2012; Baral et al., 2013; Sniehotta et al., 2017). No factors were identified at the policy level.

##### **Individual/intrapersonal factors**

Some influences were discussed at the *intrapersonal/individual* level; which focuses on an individual’s knowledge, attitudes, self-concept, skills and developmental history. Mental health, resilience, relationship with apps and alcohol were key influences on participant’s behaviour. Many participants discussed mental health problems or feeling isolated and depressed post-relationship break down; factors which led people to try GSN apps, and for a minority, take more risks on apps. Women especially felt they were more likely to use apps to improve their self-esteem and confidence after a break-up, but could also mean they relied on GSN apps as a

psychological crutch. For men, those who felt they had an unhealthy relationship with apps tended to worry about GSN apps being addictive. Addiction to the internet, social media or online sex (including pornography and cyber-sex) are associated with negative mental health outcomes (Griffiths, 2012; Kuss et al., 2014; Kuss and Griffiths, 2017), though evidence is mixed about the role of addiction on online dating (Bonilla-Zorita et al., 2020). Many participants of all genders discussed how you needed thick skin and resilience to cope with rejections and judgements on apps, but many did not feel they had this resilience.

*Figure 7.7. Influences on how people use GSN apps; the socio-ecological model of health (adapted from McLeroy et al. (1988))*



Alcohol consumption also influenced behaviour. Many participants, especially women, were unlikely to go straight to someone's house, met dates in a bar and consumed alcohol. Alcohol was thought to increase confidence and make dates easier. Alcohol use is common amongst MSM who use apps with one US study showing 30% of Grindr users were under the influence of alcohol or drugs last time they had sex (Rice et al., 2012). Alcohol did make some participants less risk averse; alcohol made men more likely to arrange a hook-up more quickly or do less research before going to meet a hook-up and made women more likely to talk to people on apps, but not more likely to meet up. Only one participant discussed how being drunk affected their condom use; which is different to other research with Grindr and Jack'd users in NYC and Hong Kong that found drug and alcohol use was associated with increased CAI (Goedel and Duncan, 2016; Yeo and Ng, 2016).

Interventions at the personal level that promote mental wellbeing and increase resilience and coping skills could encourage safe and healthy use of GSN apps. Participants did not lack knowledge about how to use apps or stay safe physically; it was more about how they coped with rejection and judgements. Personal level

interventions to address addiction may also be appropriate and encouraging other ways of meeting people away from alcohol venues could reduce risk-taking behaviour.

### **Interpersonal factors**

Many influences on behaviour were discussed at the *interpersonal* level; which focuses on the influence of family, colleagues and friends, social identity and emotional support (McLeroy et al., 1988). Friends encouraged initiation of GSN app use, gave guidance and support on setting up profiles and advised participants which apps to use; this was especially important for women. The social norms on apps also influenced how people used them, taking cues from what they felt were the implicit expectations of other app users. Previous research has shown sex-seeking is the normative behaviour on men's apps, especially Grindr, and those who do not use it solely for casual sex or hook-ups feel there is something wrong with them (Licoppe et al., 2016; Jaspal, 2017). This is despite seeking friends and community being a key reason many men use GSN apps (Chan, 2016; Schipani-McLaughlin et al., 2017; White Hughto et al., 2017; Chu et al., 2019)

Participants also discussed how family and religion had influenced them referring to how "out" they were; families could be a source of support or stress. Many had had a religious upbringing but no longer had a faith, some because they could not reconcile their religion and sexuality. For some younger participants, living with family limited their ability to use GSN apps or meant they had to keep their dating and sexual lives secret. From a safety perspective, this is a concern; if GSN app users are not open about their sexual orientation with the people they live with they may not tell someone where they are going or may take risks to cover over meeting same-gender partners.

Interventions aimed at friends and family of app users encouraging people to support each other could promote healthy behaviour. Correcting misinterpreted social norms could also reduce unhealthy behaviours (Reid et al., 2010; Tankard and Paluck, 2016). Messages, possibly on GSN apps themselves, could enable users to understand not all app use is about finding casual sex, which might in turn reduce sexual risk-taking behaviour.

### **Institutional factors**

At the institutional level (which focuses on social institutions & organisations, rules & regulations) the technology and design of apps influence behaviour. Due to when they were developed, the original socio-ecological models do not refer to technology or social networking (Bronfenbrenner, 1977; McLeroy et al., 1988). Although recent research on HIV acquisition has placed apps such as Grindr within the *community* level of the SEM (Gourlay et al., 2017), that only referred to use or non-use. The specific functions of each app could be viewed as the rules of an institution. The design and functionality of each app influenced which app people choose, how they used it and the type of encounter they sought. For example, some GSN apps focus on looks and temporary connections (e.g. Grindr had brief profiles, information on preferred sexual position and last STI and facility to exchange explicit photos), whereas other apps encourage people to get to know each other and form deeper connections (e.g. OKCupid had personality questionnaires and detailed profile text). For women, the functionality was less important, and they tended to choose apps based on numbers. It may be that WSW then adapt their behaviour and expectations to fit in with the functionality of the most popular apps, rather than choose an app that reflects the functions they want.



Some research has identified the normative sex-seeking behaviour on Grindr, encouraged by users and functionality (Licoppe et al., 2016; Jaspal, 2017), but no research has systematically examined how the functionality of each app influences behaviour and differences between individual apps. Further research is needed. App developers themselves would need to take some responsibility to adapt or limit the functionality of their service if behaviour is going to change. However, apps themselves are profit-making organisations whose main aim is the increase number of users and thus revenue, rather than influence behaviour (see reflections box 9.1).

### **Community factors**

At the *community* level (focusing on relationships between organisations, institutions and informal networks), the only factors influencing behaviour was the availability drugs on apps. Most men were aware of chemsex and saw profiles referencing it. A small minority of men in this study used cannabis but none engaged in chemsex, most actively avoided profiles that mentioned it. Therefore, although drugs associated with chemsex were easily accessible in the community the participants in this study were not taking up these opportunities. This is despite evidence showing chemsex is common amongst British MSM and likely to be higher in GSN app users compared to non-users (Schmidt et al., 2016; Curtis et al., 2020) and often facilitated through GSN apps (Patten et al., 2020). However, recent research in England has shown found chemsex is actually lower in app users compared to MSM recruited in sexual health clinics (Blomquist et al., 2020).

Interventions or policies that limit the accessibility of drugs on apps could reduce their usage. However, this would require the app companies to crack down on dealers. Grindr and Jack'd do censor some symbols or terms for methamphetamine (including cloud emojis, "meth", "parTy" and "T4\$") however Grindr have been accused of not taking the issue seriously and effectively facilitating drug deals (WEHOville.com, 2016; Strudwick, 2019).

No factors discussed by the participants were at the policy level of the SEM, however, this may be because app users are unaware of such policies or how they affect their behaviour. The majority of interventions aimed at GSN app users, mainly on MSM apps, have focused on the individual level by promoting HIV/STI testing and increasing condom use (Muessig et al., 2015; Rosengren et al., 2016; Choi et al., 2020). Mapping influences on the socio-ecological model of health has demonstrated how interventions could be effective at multiple levels, rather than just the personal level. Complex system approaches and interventions that address all levels of the SEM are likely to be most effective (Golden and Earp, 2012; Rutter et al., 2017; Craig, 2018).

### **7.4.6 Strategies to reduce risk and maximise benefits**

Participants had a variety of different approaches to using apps and whilst some used specific strategies, others thought of them less as strategies but rather just "normal ways of using the apps". Men were more likely to talk about safer sex (see 7.4.1.2) and women were more concerned about physical safety (see 7.4.1.3). In terms of mental health, men and women were similar in how they interact on apps and regularly delete apps. Although previous research has tended to focus on patterns of use and risky behaviour on apps (including sexual health outcomes (Goedel and Duncan, 2015; Allen et al., 2017; Chan, 2017; Choi et al., 2017), alcohol/drug use (Landovitz et al., 2013; Goedel and Duncan, 2016) or body image (Goedel et al., 2017b; Filice

et al., 2019) little research has examined any strategies of use or related harm reduction practices. In this study people protected themselves in three main ways, with no differences between the Merseyside and Connecticut.

Firstly, participants made deliberate and conscious decisions about how they interacted with people on apps. This confirms previous qualitative research showing MSM avoid profiles without face photos and exchange multiple photographs before meeting (Albury and Byron, 2016; White Hughto et al., 2017; Lauckner et al., 2019; Numer et al., 2019). Fear of deception was common across all genders and sexual orientations and partners met online are perceived to be more dangerous than those met through traditional methods (Bonilla-Zorita et al., 2020). It might have been assumed that faceless profiles could be a potential concern to physical safety, given the media coverage of violence against men by people they meet on apps (Simmons, 2016; BBC News, 2019). However, it seems our participants were so unlikely to even consider meeting up with someone without seeing a face and knowing they felt an attraction, that physical safety was not the worry.

Although no questions asked specifically about honesty on apps this was an important issue for participants; being truthful themselves and expecting honesty from other users. Being transparent about what people were looking for (e.g. just sex or a relationship) is important to reduce confusion, damage to self-esteem and protect mental health. However, this honesty had a limit with some participants being careful not to share too much personal information on apps, this confirms research with younger WSW and MSM in Australia who were careful about disclosing personal information to people on GSN apps (Albury and Byron, 2016).

Secondly, some participants had specific strategies they employed when arranging to meet up with people in real life. Women were more concerned about physical safety than men and women were less concerned about their physical safety when meeting women from apps, despite studies showing WSW experience intimate partner violence at similar or higher levels than heterosexual women (Rollè et al., 2018). However, plurisexual women were especially concerned when they met up with men from apps and spoke about being very cautious and even scared, some so nervous they had stopped interacting with men on apps.

Although more common in women, some men were concerned about physical safety and a minority of men discussed friends who had been assaulted or media coverage of violence by Grindr users. Precautions about personal safety are not new or unique to app users. Data collected in 2005 showed similar tactics were used by young MSM in New York when they met sexual partners through the internet (Bauermeister et al., 2010) and app-using MSM in CT were concerned about experiencing homophobic violence in small cities (White Hughto et al., 2017).

Thirdly, deleting or uninstalling GSN apps was a common protective behaviour amongst all genders; apps were deleted, hidden, muted or uninstalled after participants had been insulted or harassed on apps or after apps had a negative impact on their mental health or happiness. Many participants used apps in cyclical ways, using them for a few weeks or months, getting frustrating and deleting the app, then a few weeks or months later re-downloading and using until they got frustrated again. "Leaving" GSN apps is not a singular moment, men who leave Grindr for good report it can be repetitive or gradual process and deleting the app is not the same as deleting the user account for good (Brubaker et al., 2016).

The three themes identified in this study show app users are already using a variety of harm reduction strategies limit their physical and mental health risks. Health promotion is most effective when it builds on what people already do, ensuring people have the capabilities, opportunities and motivations to make manageable changes (Michie et al., 2011; Michie et al., 2014). The findings from these interviews demonstrate that most GSN app users are motivated to reduce risk and these existing strategies can provide a basis for health promotion to build on.

The apps themselves may be the appropriate place to promote this behaviour change. Some organisations use men's GSN apps for outreach or health promotion, though the evidence of its effectiveness of this is new and inconsistent (Lampkin et al., 2016; Fantus et al., 2017; Sun et al., 2018; Grov et al., 2020). In the UK, there have been calls for men's GSN apps to take more responsibility for sexual health and reducing HIV risk (Kirby and Thornber-Dunwell, 2015). Although some GSN apps offer reduced advertising fees for health promotion, other apps have been criticised for focusing solely to facilitating unprotected sex (Kirby and Thornber-Dunwell, 2015).

Most health promotion on apps (both in-app and outreach by NGOs) relates to sexual health and HIV. However Grindr recently released a "holistic safety guide" on their app (see figure 2.2; Grindr for Equality, 2019). This guide provides advice on how to ensure digital safety, personal safety and protect self-care and wellbeing, mainly focusing on security and safety rather than health. Most of the topics in the Grindr guide were discussed by some of the interview participants, however, it also includes topics that were not discussed by any interview participants including detailed advice on strict digital security (which appears to be mainly aimed at Grindr users in countries with high homophobia and laws against homosexuality) and some general advice on healthy living (diet, exercise, etc.; Grindr for Equality, 2019). The only interview finding not covered by the guide relates to taking a break from the app or uninstalling it; this is not surprising as we would not expect Grindr to suggest people stop using their product (see reflection box 9.2). This guide was released after data collection was completed so could not be discussed with participants; further research is needed to understand if app users are aware of the guide or find it appropriate.

#### **7.4.7 Limitations**

The main potential limitation in this research comes from the recruitment methods and sampling. Originally it was hoped that some of the interview participants would be people who completed the survey, which would provide a broad and varied sample. Although 34 people provided contact details and were invited for interview, only one survey respondent agreed to be interviewed (man in MS). The remainder of the participants were recruited through purposive sampling using community adverts (both online and offline) and some snowballing. Snowballing can potentially introduce homogeneity to the sample (Bowling, 2014), however this was only one of the sampling approaches. In both areas the sample was highly educated, and many worked at or studied at universities in Liverpool and New Haven. Their experiences are likely to differ from the experiences of more deprived and less educated LGBTQ+ people. From a public health perspective this is likely to bias the results as in both the UK and USA people living in more deprived areas or with lower education are also likely to experience poorer health and exhibit more damaging health behaviours (Dickman et al., 2017; Marmot, 2020).

Although recruitment was focused over all of CT and Merseyside, only two of the 17 CT participants lived outside of New Haven County and four of the 15 Merseyside participants lived outside of Liverpool. As Merseyside is such a small area this is unlikely to influence the findings too much as Liverpool is the centre of the county and the main entertainment and commercial centre. However, CT is considerably larger and experiences of people living in New Haven are likely differ from those of people living in Hartford (state capital) or smaller towns. New Haven has a big Ivy League university, which is likely to make the city more liberal and tolerant. Although the participants were predominantly white, in both areas it was relatively representative of the local population (three MS participants were not white British and in CT five participants were not white American). As with all qualitative research, the findings are unlikely to be generalisable to the whole population, but might be transferable to populations in similar, liberal cities with large universities.

The style of the interviews may have also introduced bias; the interviews were more of an informal conversation than a formal objective interview. The positioning of the researcher an insider rather than an interrogator had the potential to lead the discussion, however great care was taken to ensure the participants views took precedence and on a number of occasions participants responded to the interviewers comment saying they had had the opposite experience of apps. The mock profiles may have led the conversation as they raised some of the key issues around ethnicity, offensive behaviour, drugs, unsafe sex and requests for threesome. However, many participants brought up these topics independently and most participants agreed the tropes on the profiles were very common and few had never seen mention of these issues. However, we can be relatively confident these profiles did not lead the conversation, an example being that one of the African American CT participants did not discuss race at all even after seeing the term “prefer white guys” on one profile.

With all qualitative research, the researcher has the potential to influence the findings during analysis. Codes and themes were discussed with supervisors at three stages (section 6.5) to increase the confirmability and maintain a distinction between the researcher’s personal values and the participants (Tolley et al., 2016). The use of standardised questions and the mock-profiles added to the dependability of the results (Bloomberg and Volpe, 2012). Additionally, despite the final themes closely reflecting the research objectives, the analysis was entirely inductive and informed by the data (see reflection box 6.2). Utilising a mixed methods approach and triangulating the two studies (chapter 8) improves the validity and reliability of this qualitative phase (Golafshani, 2003).

None of the apps used by WSW offer any facility to deliver ads to users therefore health promotion on apps was not discussed with women. In hindsight, this was a missed opportunity; the technology and app revenue streams are likely to change in the future so it would have been interesting to understand if this is something WSW would find acceptable.

## Chapter Eight | Triangulation and Integration of Findings

### 8.1 Introduction

This chapter brings together the key findings from the online survey (n=207) and the in-depth interviews (n=33) in CT and MS, using the Farmer et al. (2006) framework (see section 3.2.3 for method). The findings for these two studies have been presented separately in chapter 5 and 7 with discussion of implications and how the findings link to previous research.

### 8.2 Research context – plurisexual and non-binary identities

In both studies, participants in CT reported more fluid and less binary identities. Compared to MS, significantly higher proportions of survey respondents in CT had a trans history or were plurisexual. CT survey respondents also reported sex with a wider variety of genders in last 12 months, and a significantly higher proportion also used apps to find opposite gender partners. During the interviews, CT participants used terms such as “queer” more often and generally talked about gender or sexual orientation in less binary terms. The use of the word “queer” may just be a language issue, with the word possibly being more common or popular in the USA. These identity or behavioural terms may not be transferable between the UK and USA and health promotion must ensure they are locally relevant.

More women were plurisexual or did not use terms for sexual orientation. In the survey, only 57% of women identified as gay, lesbian or homosexual compared to 90% of men and significantly more women used apps to also meet opposite gender partners. Fewer than half the women interviewed identified as gay or lesbian, with most using other terms such as bisexual, pansexual, asexual or queer. However, despite these terms nearly two thirds were only using apps to meet other women. Only two of the men interviewed identified as plurisexual and only one of them used apps to meet women. Plurisexual women reported the most concern for their safety and were the most cautious using apps to talk to or meet men. How plurisexual women use GSN apps needs further investigation, especially as bisexuals experience worse physical and mental health outcomes than their heterosexual or gay/lesbian counterparts (Dilley et al., 2010; Colledge et al., 2015; Booker et al., 2017).

### 8.3 Triangulation

The key themes are presented in a table for each research objective. Due to its size, objective 2 (risks and benefits) is split into two tables. Objective 5 (differences and similarities in behaviour between study sites in the UK and USA and between gender groups) is not presented in a separate table as themes relating to area or gender groups cut across all the other four objectives. A tick (✓) indicates which study included reference to that theme, irrespective of agreement. The colour coding of the final column shows convergence of the findings. After triangulation, it was noted that there were no themes where dissonance had been observed - this is likely due to the different focus of the two methods.

The two methods had different research objectives, with some crossover. The survey aimed to quantify and measure how and why people used apps and understand difference between genders and areas. The in-depth interviews also investigated this, but went deeper and explored app users’ experiences and what influenced their behaviour on apps. The interview discussion guide was the same for all participants; however, the semi-

structured nature allowed the interviewee to focus on their specific experiences and what was important to them. A topic that was rarely covered in the survey related to sexual health, there were two reasons for this. The main is the challenges inherent in asking a broad range of LGBTQ+ people about sexual health in one general survey (discussed in depth in section 4.2.2). The second challenge was the difficulty of asking nuanced questions about sexual experience, dating and romance within a quantitative, positivist method. Subsequently, in the triangulation tables below, there are a number of key themes that were only evident in the interviews.

### **8.3.1 Understand patterns and motivations for using GSN apps by people seeking same-gender relationships/sexual partners in Merseyside and Connecticut. (Objective 1)**

Objective 1 examined patterns of app use by the populations in the two study sites: which apps they use and how often; their intentions and motivations for use; what kind of partners they have on apps; and what factors are associated with higher numbers of sexual partners. The survey mainly focused on this objective and these questions were not covered systematically in the interviews. Table 8.1 provides an overview of the key themes from the two studies.

Overall apps were used in very similar ways in CT and MS; the big difference was, not surprisingly, between men and women. There was agreement across the two studies that men in CT and MS used apps in very similar ways (no differences between motivations for using apps; which apps were for serious or casual partners; number of overall sexual partners and app partners; proportion of partners met on apps; frequency of app use; and proportion using apps to also meet opposite gender partners). In the interviews, there were no notable differences between how the men in the two areas talked about their app use. As these patterns of app use are very similar, we can conclude that the evidence from USA about health outcomes are likely to be similar for MSM in the UK, given the same contextual factors. Women in CT and women in MS were also very similar on the same measures (as above). Therefore we could conclude the very limited evidence about WSW and apps from USA may be relevant to the UK, however only one study from USA included WSW and grouped them in with MSM as “people who had any same-sex partners in last 12 months” (Rogge et al., 2020). In contrast to the MSM evidence, the existing research with WSW or larger studies including WSW comes from Australia and New Zealand (Albury and Byron, 2016; Pond and Farvid, 2017; Watchirs Smith et al., 2018; Ferris and Duguay, 2020). Thus, to our knowledge, this also is the first research focusing on app use by WSW in USA or UK.

Due to the differences between men and women on most indicators, we must conclude, again not surprisingly, that not all the evidence about how men use apps is relevant to women. The LGBTQ+ community cannot be treated as homogeneous. Despite most health research with this population focusing on MSM (Boehmer, 2002; Berg et al., 2016), they are not the only ones who experience health inequalities; all members of the LGBTQ+ community have worse physical and mental health outcomes than heterosexuals (Meyer, 2003; King et al., 2008; Institute of Medicine, 2011; Lick et al., 2013; Hudson-Sharp and Metcalf, 2016). Mental and physical health inequalities are even more pronounced in plurisexual people (Dodge and Sandfort, 2007; Plöderl and Tremblay, 2015; Booker et al., 2017); further research is needed to understand how GSN apps may influence the health of this more vulnerable group.

Table 8.1: Themes from objective 1: Patterns and motivations for using apps

Theme	Survey	Interviews	Findings	Convergence
<b>1.1 Similar apps used for similar reasons in CT and MS</b>	✓	✓	<p><b>Survey:</b> For men, Grindr was most popular app (ever used by 92%), followed by Tinder (76%) and Scruff (58%). For women Tinder was the most popular (86% had ever used), Her (62%) then POF (52%). No differences between the areas. There were no significant differences between why each gender in two areas use apps or time spent on apps.</p> <p><b>Interviews</b> – Very little difference between which apps were discussed in CT and MS – OKCupid appeared to be slightly more popular in CT but this may be because women interviewed in CT were more likely to be plurisexual.</p>	Agreement
<b>1.2 Men and women use apps in different ways, however, they are very similar in both CT and MS</b>	✓	✓	<p><b>Survey:</b> Significant differences between men and women on which apps they used and why. men had more sexual partners (generally and on apps) and reported significantly higher frequency of app use. A significantly higher proportion of women also used apps to find opposite gender partners. Comparing women in CT against women in MS, and men in CT against men in MS there was no significant differences in: which apps used; which app chosen for serious relationships and casual sex; number of sexual partners (overall and met on apps); proportion of sexual partners met on apps; time spent on apps, and; proportion using apps to also meet opposite gender partners.</p> <p><b>Interviews:</b> Women in CT and women in MS, and men in CT and men in MS, were similar in: their reasons for using GSN apps; the differences between apps and the other ways they might try to meet people if apps did not exist. Only minor difference between women in two areas was that more women in CT used apps to meet men as well as women (see below)</p>	Agreement
<b>1.3 Multiple app use is common – both concurrent and over time</b>	✓	✓	<p><b>Survey:</b> Almost half had ever used 4 or more apps. Using 4 or more apps was significantly more likely in men (AOR=3.4), those who had used apps for 4 years or more (AOR=2.1) and those who reported all or most LGBTQ+ friends used apps (AOR=2.6). Overall Tinder was the most common app, 81% people used it (86% of women, 76% of men)</p> <p><b>Interviews:</b> Twenty-five separate apps used by the participants (10 unisex/general, 10 men's and 5 women's). Tinder was most commonly used app, only three users (1M/2W – all CT) had never tried Tinder. Most participants talked about having multiple apps on their phone at once though some had found a specific app they preferred. Only a minority of participants had only tried one app and discussions jumped between apps.</p>	Agreement
<b>1.4 People use apps for many reasons, sex is only one of these</b>	✓	✓	<p><b>Survey:</b> Only 9% of participants only used apps for one reason, most ticked two or more reasons. Only 29% of men and 14% of women said main reason for using apps is to find sexual partners. When asked all reasons sex was one motivator for 77% of men and 51% of women.</p> <p><b>Interviews:</b> Participants were currently or had in the past used apps for many reasons; only 2 participants (1W and 1M in CT) were using apps for only one reason and neither were just for sex. People's reasons often changed over short periods of time, or people were primarily using for one reason but open to other outcomes. For example, some people were mainly looking to find casual dates, but were also open to a serious relationship if they met the right person. Similarly some people were using apps to try to find a long-term, serious partner but were happy to hook-up with people in the meantime. Intention did not always match outcome.</p>	Agreement



<b>1.5 Men's app use is more sex focused than women</b>	✓	✓	<p><b>Survey:</b> Men more likely to use apps to find sexual partners (77% give as one reason and 29% as main reason for app use) compared to women (51% give as one reason and 14% main reason). Men reported significantly higher number of overall sexual partners and app partners – however, men and women met similar proportion of their sexual partners on apps.</p> <p><b>Interviews:</b> More men (10M/5W) looking for casual sex and hook-ups on apps. More men talked about hook-ups where they arranged meeting purely for sex without a date first. Women always met for a date/drink first, even if they had sex that night. Men talked more openly about sex and most had had sex with multiple partners met through apps; women talked about fewer sexual partners and tended to discuss dates (often ending in sex) or short-term relationships (however participants were not asked to quantify these).</p>	Partial agreement
<b>1.6 Apps are not all the same – however distinction between app purposes is clearer for men than women</b>	✓	✓	<p><b>Survey:</b> Scruff users were older and had more sexual partners in last 12 months; younger and bi/other/no term respondents were more likely to use Tinder. Men were more clear that Grindr is for casual sex (79% said best app for casual) and less clear that Tinder was more for serious (48%). Women generally thought Tinder was for casual (65%) but very little consensus on which app was best to find a serious relationship (26% said HER). A third of men had deleted their Grindr profile.</p> <p><b>Interviews:</b> Different apps used for different reasons – however use is blurred, especially for women. Men were more clear – Grindr is for sex, Tinder for dates. Women used whichever app had the highest number of users; it was more about local numbers and navigating the apps rather than a clear aim or type of person they were aiming to meet.</p>	Partial agreement
<b>1.7 For men there is a relationship between number of sexual partners, higher app use and reason for using apps.</b>	✓	✓	<p><b>Survey:</b> Significant relationship between using apps to find sexual partners, frequency of app use and number of sexual partners. Logistic regression showed those who say one reason they use apps is to find sexual partners are three times more likely to report they have more partners because of apps; but we cannot know cause and effect. Significant but weak positive correlations for men between frequency of app use and number of sexual partners (not significant for women).</p> <p><b>Interviews:</b> Men reported that the design and marketing of certain apps was associated with either sex (e.g. private albums for explicit photos) or serious relationships (e.g. more text on Tinder profile and no information about sexual health). These factors influenced which apps men choose and how they use them. The apps designed to focus more on sex get used more by men looking for sex and this is self-perpetuating.</p>	Partial agreement

There was agreement across the survey and interviews, in both areas for all genders, that sex is only one reason people use GSN apps. However the majority of research on GSN apps has focused on sex, sexual risk behaviour, STIs and HIV, especially amongst MSM users (Choi et al., 2017; Queiroz et al., 2017; Zou and Fan, 2017; Wang et al., 2018). It is important to acknowledge that there are many reasons people are using apps and the sex-focus is reductionist. Previous research into GSN app use by MSM has tended to focus on just Grindr or group all GSN apps together. However, men in the survey and interviews used different apps for different purposes. Grindr was universally viewed as being mainly for casual sex and not serious relationships. However, some participants had fallen in love with people they met through Grindr. Research and health promotion cannot just focus on “Grindr users” or aim health promotion at “Grindr users”. For women, the apps they choose appeared to be more about the numbers on each app and which design they preferred.

There was partial agreement between the two studies that, for men, there is a relationship between number of sexual partners, higher app use and using apps to find sex. Putting more effort into seeking sexual partners (e.g. on GSN apps, websites or offline) is linked to increased sexual risk-taking behaviour. However, it is more the breadth of venues and intensity of partner-seeking that is important; utilising multiple avenues is the important factor for sexual risk, not GSN app use itself (Lee et al., 2012; Kerr et al., 2015; Dangerfield et al., 2020; Rogge et al., 2020). The negative media and scaremongering around GSN apps such as Grindr (Gabbat, 2015; Woo, 2015) is likely to be incorrect; apps themselves are unlikely to cause sexual ill-health. It is more that those who might take sexual risks are likely to use apps. Demonising apps is not going to promote safe behaviour and is unlikely to encourage people to adopt harm reduction strategies. It can also increase stigma for an already marginalised group.

### **8.3.2 Investigate how people in Merseyside and Connecticut who use GSN apps view the benefits of apps and any potential health risks (Objective 2)**

This research objective aimed to investigate any health outcomes users have experienced and how they perceive the benefits of using apps (including social, health, sexual and emotional benefits) and potential risks or negative outcomes of GSN apps (including emotional risks, personal safety and sexual, mental and physical health). Two tables are presented for this objective; table 8.2 provides an overview of the health benefits and table 8.3 an overview of the perceived health risks.

Table 8.2: Themes from objective 2: Positive outcomes and benefits of app use

Theme	Survey	Interviews	Findings	Convergence
<b>2.1 Apps provide easy access to a large pool of potential romantic and sexual partners</b>	✓	✓	<p><b>Survey:</b> In the open text question, respondents felt apps increased the pool of people to date. For women apps help them to meet a wider range of people and get to know them on the app first before they arrange to meet up; allowing them to be more selective about who they date. Men suggested apps allow quick, easy access to a bigger pool of sexual or romantic partners.</p> <p><b>Interviews:</b> All genders felt apps allowed them access a wider group of people, outside of their social circle and especially important in small cities. Women talked about how they could be more selective and how apps allowed them to get to know partners better before meeting and found it a low commitment way to meet people. For men the apps also enabled a fast and easy way to meet a broader selection of local people.</p>	Agreement
<b>2.2 Apps boost self-esteem</b>	✓	✓	<p><b>Survey:</b> In the open text questions a minority of people said apps help with shyness and are good for introverted people.</p> <p><b>Interview:</b> This positive impact of app use was a very important theme with over two thirds of participants talking about how apps boosted their self-esteem and wellbeing: 1) self-esteem is boosted when they match with attractive people or receive compliments on apps, 2) apps lead the real-life relationships (platonic, romantic and sexual) that helped shy introverted people and increase confidence in long-term.</p>	Partial agreement
<b>2.3 Apps provide friendship, social support and a way to enter the LGBTQ+ community</b>	✓	✓	<p><b>Survey:</b> Seeking a non-sexual outcome was a common reason for using apps; 58% men and 62% of women said one reason they used apps to find friends, however this was a primary motivator for only 9% of men and 7% of women. Those whose main reason was to find friends were the least “out” meaning they were more likely to hide their sexual orientation from their friends, families and colleagues.</p> <p><b>Interviews:</b> Although friendship was the primary motivating factor for a minority of participants – platonic friendship was a common by-product of app use. Many participants talked about using apps when coming out to connect to the local LGBTQ+ community, online support and friendship, finding community or friends when travelling or in new areas.</p>	Partial agreement
<b>2.4 Apps were used to kill time, for men boredom was associated with sexual desire</b>	✓	✓	<p><b>Survey:</b> Men were more likely than women to use apps when they are bored or want to kill time (75% of men and 51% women gave this as one reason for app use, 22% of men and 6% women main reason)</p> <p><b>Interview:</b> Apps commonly used when bored, to kill time, or for “window shopping”. However, men tended to link being bored and being horny together, whereas women talked about apps more in terms of entertainment or games and never related it to being horny.</p>	Partial agreement
<b>2.5 Sex/pleasure were an important positive outcome for men</b>	✓	✓	<p><b>Survey:</b> App use appears to be an effective way to meet sexual partners - those using apps to find sexual partners more likely to report they have more sexual partners now they use apps (no difference between men and women and not mentioned in the open text questions).</p> <p><b>Interview:</b> Sex and pleasure was mentioned as a positive outcome for half of men but not mentioned by many women or any non-binary participants. Half of men also used apps for sexting and exchanging photos and talked positively about this feature.</p>	Partial agreement
<b>2.6 GPS feature helps people find partners nearby</b>		✓	<p><b>Survey:</b> no mention of GPS features</p> <p><b>Interview:</b> GPS feature was discussed by two thirds of participants – allowed them to know how close potential partners were, this was important to those looking for quick casual connections, serious relationships and for younger people/students who could not travel.</p>	Silence

Both studies agreed that apps provided easy access to a larger pool of potential sexual and romantic partners locally. The research and discussion around the GPS element of apps often focuses on immediacy, enabling people to find casual sex more quickly (Blackwell et al., 2015; Licoppe et al., 2016). However, proximity was important to people seeking a variety of outcomes on apps; quick casual sex, serious relationships and younger people who could not easily travel. A bigger pool of potential partners also gave people more freedom to choose who they date or hook-up with and, potentially, lead to more satisfying relationships.

There was partial agreement across the two studies that apps improved mental health by increasing self-esteem and providing a way to make friends, reduce isolation and loneliness, provide access to a local or online LGBTQ+ community and find social support. All of which were linked to improving mental health. Social support, social cohesion and connection to the LGBTQ+ community improve mental and physical health (Berkman, 2000; Detrie and Lease, 2007; Doty et al., 2010; Ikeda and Kawachi, 2010; Gibbs and Rice, 2016) and may help ameliorate the impact of minority stress (Meyer, 2003; Hill and Gunderson, 2015). For young MSM, feelings of social isolation can be exacerbated by homophobia, limited opportunities for socialising and a primary focus on sex within relationships (LeGrand et al., 2014). LGB men and women have generally lower self-esteem than their heterosexual counterparts (Bridge et al., 2019), so apps may provide an opportunity to address this. The only partial agreement on this theme is because the survey did not focus on mental health outcomes but more on patterns of use. Asking questions about changes in confidence or loneliness is more suited to qualitative research rather than a survey; the cross-sectional survey would only be able to measure these attributes at one time point whereas the interviews allowed participants to reflect on their experiences.

The societal and public health discourse around GSN apps has tended to focus on negatives and judge or vilify users (Holloway et al., 2014a; Gabbat, 2015; Woo, 2015). Promoting the community cohesion benefits of apps and advertising to correct misunderstood social norms could change the sex-focus, reduce isolation and potentially improve the mental health of LGB app users. There is a disconnect between the way policy makers and the media discuss GSN apps and the actual experiences of those using apps. This highlights the needs for co-produced health interventions grounded in the experiences of those who use the technology.

Apps were entertaining and relieved boredom; people of all genders reported scrolling through app profiles as a fun and enjoyable activity. For men in the interviews, but not women, boredom and killing time on apps was often linked to feeling horny, masturbating and exchanging or explicit photos and message. Previous research has found two thirds of Grindr users gave boredom or killing time as one reason they used apps (Duncan et al., 2018b) but only a fifth list it as their main reason for using Grindr (Goedel and Duncan, 2015). The survey question (taken from these two studies) does not explore how boredom links to seeking sexual stimulation. The interviews were able to explore this issue further and found men linked boredom and feeling horny, whereas no women did. GSN apps are not just about arranging to meet people but have provided a new form of amateur porn for MSM through a gamified platform where people exchange photos (Phillips, 2015; Tziallas, 2015). There are potential security and privacy issues with exchanging explicit photographs of which men, especially younger men, may not be aware. Further research is needed into how men engage in such “cybersex” and manage their privacy.

Table 8.3: Themes from objective 2: Negative outcomes and risks of app use

Theme	Survey	Interviews	Findings	Convergence
<b>2.7 Fear of violence is common in people who meet/date men, but few have experienced it</b>	✓	✓	<p><b>Survey:</b> Open question about worries showed men were particularly concerned about violence and safety, however few reported having experienced it. A third of men worried about violence compared to a quarter of women.</p> <p><b>Interview:</b> 5 people (3M/2W) reported non-volitional sex with people they had met on apps – varying degree of severity and impact on participants. No one had experienced any physical violence; however half of men were concerned about physical violence from men they met through apps. The only women who talked about fear of violence were plurisexual and related it to meeting men, their only fear when meeting women was they might be catfished and actually be meeting a man.</p>	Agreement
<b>2.8 Offensive behaviour commonly experienced/ witnessed by men on GSN apps (inc. racism, discrimination &amp; body shaming)</b>	✓	✓	<p><b>Survey:</b> In the open text question more men provided information on negative experiences on apps. Though these tended to relate to deception and catfishing, one in ten mentioned rude and offensive behaviour or abusive messages.</p> <p><b>Interview:</b> Men reported widespread negative virtual interactions on apps that impacted on their wellbeing – the most common of these being witnessing racism, body shaming and discrimination against effeminate men (homonegative statements). It was common to see “no Asians” or “straight acting only” which made participants quite angry. Only offensive behaviour experienced by women related to threesome requests from man/woman couples.</p>	Partial agreement
<b>2.9 Fear of misrepresentation, deception, catfishing and scams common on apps</b>	✓	✓	<p><b>Survey:</b> The main worry and negative experience GSN apps reported in the open text boxes related to deception, dishonesty, catfishing, scams and misrepresentation on apps. One in five people who answered the question about worries used the word “catfishing”</p> <p><b>Interview:</b> Participants felt it was important for them and other app users to be honest and upfront about who they were and their intentions. Many participants felt they had been deceived or misled by someone on an app who had misrepresented themselves on their profile or not been fully truthful. Very few participants had actually been scammed or outright lied to, it was more that people were economical with the truth.</p>	Partial agreement
<b>2.10 Self-esteem is affected by rejection on apps</b>	✓	✓	<p><b>Survey:</b> In the open text question about negative experiences, rejection was an important issue: one in four women and one in seven men reported being rejected or ghosted on apps. However, few participants stated how this rejection had made them feel.</p> <p><b>Interview:</b> Interviews with all genders showed rejection has a negative impact on self-esteem. Two types of rejection mentioned: outright rejection with “ghosting” being the most painful and detrimental to wellbeing. Secondly, other app users ignoring their messages made participants question their worth and attractiveness. Half of participants discussed that apps had both a positive and a negative impact on their self-esteem.</p>	Partial agreement

<b>2.11 Focus on sexual appeal and body image on men's apps has a negative impact on self-esteem</b>		✓	<p><b>Survey:</b> no mention of body image, body shaming or physical appearance in questions or provided in any open text questions survey responses.</p> <p><b>Interview:</b> Over two thirds of men talked about how apps made them feel bad about their physical appearance or they experienced body shaming on apps. Discussed by fewer than a third of women. Men's apps were thought to be too focused on physical appearance. Many men had seen judgemental or "body-shaming" statements profiles (e.g. "no fat guys") and a minority had received spontaneous messages or rude rejections that referenced their looks. Men also compared their bodies to the perfect torso shots on apps such as Grindr. Half of men thought apps were too focused on casual sex and how people looked to the detriment of real connections between people.</p>	Silence
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Fear of deception, misrepresentation and scams were a big fear for people of all genders; for some this was also a fear of potential subsequent violence. This came up in both the open text survey questions and interviews – honesty on apps was a big issue for users. Many of the strategies discussed in objective 4 were developed to reduce risk of this kind of deception or threat (see section 8.3.4). Although many participants in both studies were concerned, very few had actually experienced any serious incidents of deception or violence, however, some interview participants did discuss friends who had been victims of crime after meeting someone from a GSN app. A small number of interview participants also reported non-volitional sex with people they met through apps, though most did not attribute this to app use. Fear of violence was particularly high for WSW who also dated men, to the point where some plurisexual women only used GSN apps to talk to or meet women (see objective 4, section 8.3.4). The apps themselves have some responsibility for ensuring the safety of their users though policies differ and apps may need to improve their security and verification systems.

Rejection and ghosting came up on the survey and interviews. It made people of all genders feel bad about themselves and had a negative impact on self-esteem. Understanding this relationship is important as lower self-esteem is linked to higher sexual risk-taking behaviour (Preston et al., 2007; Arsandaux et al., 2020). For men, GSN apps' focus on sex, physical attractiveness, judgement and comparison made men feel bad about themselves and affected their confidence. This confirms the recently developed *intraminority gay community stress theory* (Pachankis et al., 2020) which suggests that the focus on body image, sex and status within the gay community and rejection online impacts on the mental health of gay and bisexual men. There were no specific questions about rejection, body image and self-esteem in the survey as the cross-sectional nature made it difficult to explore how apps had affected this over time. However, the open text questions on the survey revealed experiences of rejection for men and women. Interventions that help people build resilience, deal with rejection and boost self-esteem could ameliorate the effects on the mental health of app users.

In interviews men reported widespread and varied experiences of discrimination and offensive behaviour from other men on apps; both aimed at them personally and written on profiles. It included overt and indirect racism, homonegative statements (e.g. "straight acting" or "no camp") and body shaming. This was rarely mentioned by women. Perceived discrimination has a significant negative effect on mental and physical health by heightening stress responses, increasing unhealthy behaviours and reducing healthy behaviour (Pascoe and Smart Richman, 2009). Previous research with MSM has identified body-shaming, harassment and insults are common on GSN apps (Lauckner et al., 2019; Numer et al., 2019). Sexual racial discrimination is also common on men's GSN apps (Callander et al., 2016; Shield, 2018; Lauckner et al., 2019; Numer et al., 2019; Thai, 2020), especially Grindr, and negatively affects the mental health of BAME MSM (Bhambhani et al., 2020; Thai, 2020). Universally, the men interviewed in this study viewed statements such as "prefer white guys" or "no Asians" as unacceptable, however such things are clearly still very prevalent on apps, especially Grindr. Grindr continues to allow premium users to filter by ethnicity, which may promote a social norm where users can state racial "preferences" on their profile. For women the main behaviour viewed as offensive was the regular requests they received for threesome from man-woman couples, especially on Tinder. Tinder's terms and conditions explicitly state couple profiles are not allowed (Tinder, 2020), however Tinder appear to be doing little to enforce



this. The WSW interviewed in this study reported the same experiences as previous research (Duguay et al., 2020; Ferris and Duguay, 2020) and popular media (Lindsay, 2018; Vetter, 2019) regarding the pervasiveness of such profiles.

There is only partial agreement on this theme; the open text question on the survey included few responses that related to offensive behaviour on apps but it came up in most interviews, even before participants were presented with mock profiles. It may be that this type of discrimination is so widespread and expected that users do not think about it until they are exploring their experiences in greater detail. Similar to issues with deception the apps themselves need to take responsibility for reducing offensive behaviour and harassment on apps, however without more user complaints or intervention they are unlikely to change their models (see reflection box 9.2).

### **8.3.3 Explore what influences how people behave whilst seeking sexual/romantic partners on GSN apps (Objective 3)**

This objective aimed to investigate what factors influence how people use GSN apps to find partners, including environmental influences, personal capacity and peers. When looking at factors through the lens of the socio-ecological model (McLeroy et al., 1988), across the two studies influences on health varied from the individual/intrapersonal to community level. *Intrapersonal and individual* factors included gender, sexual orientation, age, mental health, relationship breakdown, self-esteem and resilience, and alcohol use; *interpersonal* factors were friends, family and religion, social norms of friends and social norms/unwritten rules on apps; an *institutional* factor was the technology and functionality of apps, and; a *community* factor was health promotion on apps. No influences were discussed at the policy level; possibly because individual app users are unaware how local or national policies may actually affect their experiences. The key findings from the two studies are presented in table 8.4.

On an individual level gender was the main influence on how people talked about their use of apps, in both studies. Although men and women in the survey met similar proportions of sexual partners through apps, men had more sexual partners and had a higher frequency of app use. Types of sexual partners could not be appropriately explored on the survey (see section 4.2.2) so this theme mainly comes from interviews. In interviews, men and women talked about hook-ups or casual sex differently; men had more hook-ups and were more likely to arrange to go straight to someone's house for sex. In contrast, women usually went on a date or drink first, not going straight to another person's house just for sex. However, many WSW did talk about sex on first dates, casual sex and "hook-ups"; it's just their definition seemed to be different. This only emerged during thematic analysis so was not addressed directly in the interviews. It is important to understand definitions of terms such as "casual sex", "hook-up" and "fuck buddy" if research is to accurately measure behaviour and health promotion targeted appropriately (Bellhouse et al., 2018).

Table 8.4: Themes from objective 3: Influences on how people use apps

Theme	Survey	Interviews	Findings	Convergence
<b>3.1 App users are influenced by a variety of factors – from the individual to community level (McLeroy et al., 1988)</b>	✓	✓	<p><b>Survey:</b> The key <i>individual</i> factors influencing behaviour were gender, sexual orientation and age. Proportion of LGBTQ+ friends using apps (<i>interpersonal</i>) was also associated with behaviour.</p> <p><b>Interviews:</b> Various influences at different levels of the socio-ecological model of health: <i>individual</i> (mental health, relationship breakdown, self-esteem, resilience and alcohol); <i>interpersonal</i> (friends, family and religion, and social norms/unwritten rules on apps), <i>institutional</i> (technology and functionality of apps), and; <i>community</i> (availability of drugs on apps). No influences were discussed at the policy level.</p>	Partial agreement
<b>3.2 Gender influences how people approach hook-ups and casual sex</b>  (Individual factor)	✓	✓	<p><b>Survey:</b> Percentage of partners met through apps was similar for all genders and areas, but men had significantly more sexual partners in total and met through apps. When asked all reasons they used apps, the second most common combination for men was using apps for sex and to kill time when bored, however very rare for women to use this combination. No women used apps solely for sex.</p> <p><b>Interviews:</b> Although some men discussed always meeting for a drink or date before sex, women said they needed to vaguely know a woman before sex. No women had arranged to meet at someone's house purely for sex – even when sex was inevitable the most casual hook-ups had always involved a drink/date first.</p>	Partial agreement
<b>Mental health, relationship breakdown and resilience influence use of and relationship with apps</b> (Individual factor)		✓	<p><b>Survey:</b> no questions about mental health, resilience or relationship with apps</p> <p><b>Interviews:</b> Mental ill-health or feeling isolated and depressed post-relationship break down led people to try GSN apps, and for a minority, take more risks on apps. Opinions were mixed on if they had a "healthy relationship" with apps - women felt they were more likely to use apps to improve their self-esteem and confidence after a break-up, but could also use apps as an unhealthy psychological crutch. For men, those who felt they had an unhealthy relationship with apps worried GSN apps were addictive.</p>	Silence
<b>3.6 Alcohol influences behaviour on apps</b>  (Individual factor)		✓	<p><b>Survey:</b> no questions about drugs &amp; alcohol on survey</p> <p><b>Interviews:</b> both men and women reported consuming alcohol changed the way they used apps. For men alcohol was linked to being more horny; deciding to meet a hook-up more quickly; be more confident to message people on apps or meet for a hook-up. For women alcohol mainly gave them more confidence to send more messages or "like" more app profiles. Women reported often drinking on dates and meeting in a bar. Some men met in bars, but many also went to someone's house to hook-up and did not drink alcohol. Only one participant (a gay man in MS) felt alcohol made them more likely to take sexual risks.</p>	Silence

<b>3.3 App use and sexual behaviour associated with peers and social norms</b>  <b>(Interpersonal factor)</b>	✓	✓	<p><b>Survey:</b> Significant linear relationship between proportion of LGBTQ+ friends who use apps and number of sexual partners and proportion of LGBTQ+ friends who use apps and frequency of apps use. Proportion of LGBTQ+ friends who use apps was one of only two factors that was a significant predictor of having more sexual partners now they use apps (AOR=4). Gender is likely to be an influential factor here, however, as men more likely than women to say all or most of their LGBTQ+ friends also use GSN apps.</p> <p><b>Interviews:</b> Friends had encouraged participants to try apps, were a strong influencing factor when deciding which app to download first and friends gave guidance on how to navigate and use apps (how to make a good profile and picture, how to deal with rejection, when to message etc).</p>	Partial agreement
<b>3.4 Social norms about expected behaviour on apps has developed from the design of technology and users</b>  <b>(Interpersonal and institutional and factors)</b>	✓	✓	<p><b>Survey:</b> For men in survey there was a general understanding Grindr was the main GSN app for casual sex, and Tinder most likely to be the app for serious relationship. For women it was less clear cut.</p> <p><b>Interviews</b> Layout and functionality of apps led to them being used in different ways – apps that allowed explicit photos more likely used for casual sex (e.g. Grindr and Jack'd) and apps with long questionnaires used for serious relationships (e.g. OkCupid). The design, intended outcome and people who used the apps was reinforcing and self-perpetuating; the design informing users, who then use apps to look for that outcome, get it and use it again. There were also thought to be unwritten rules and expected behaviour that people had to learn when they used apps.</p>	Partial agreement
<b>3.7 Although men did not think health promotion on apps influences their behaviour personally, it will influence others</b> <b>(Community factor)</b>		✓	<p><b>Survey:</b> No questions about health promotion on apps</p> <p><b>Interviews:</b> Men were asked about health promotion adverts (such as condom use, PrEP, testing info, etc) on GSN apps. The majority had seen ads but rarely read them and believed themselves to be unaffected by advertising. However, most thought it was a good place to do such ads as it was an opportune moment to subconsciously remind people about condoms at the time they are arranging a hook-up. No apps for women have facility for such ads so women not asked.</p>	Silence

Mental health, responding to a relationship breakdown and personal resilience were also factors that appeared to influence how interview participants used apps. Again, these topics could not be covered on the cross-sectional survey. Resilience can ameliorate the impact of minority stress on LGBTQ+ individuals (Meyer, 2015) so interventions that are able to promote resilience could reduce health inequalities.

Alcohol use was also a factor at the individual level. Alcohol consumption was very common for a first date and apps were often used after people had been drinking. In the recently published large US study male and female app users who report same-gender sexual partners in the last year were more likely to report a hook-up involving drugs or alcohol than heterosexual app users (Rogge et al., 2020). Alcohol generally increased confidence on apps: for men alcohol encouraged them to hook-up with someone from an app; for women it made them more likely to match or message someone on an app. Alcohol is known as a “social lubricant” which reduces inhibitions (Monahan and Lannutti, 2006) and previous research with MSM has linked alcohol with increased sexual risk-taking (Colfax et al., 2004; Koblin et al., 2006; Heidinger et al., 2015). However, this study found little evidence of this; only one man discussed how he was less likely to use condoms when drunk. The cross-sectional survey included no questions on alcohol. Alcohol and drugs were only a minor part of the interview discussion guide and further research needs to fully explore how alcohol affects decision making on GSN apps.

At the interpersonal level, real world friends and social norms influenced how people used apps, with partial agreement over the two studies. In the survey, there was an association between the proportion of LGBTQ+ friends who use apps and the number of sexual partners and having more partners now they use apps. Interview participants discussed how their friends had suggested initiating app use, managing app use and meeting people. People possibly adjust their behaviour to fit in with what they perceive to be the “norms” within their friendship groups. Further research investigating if people are incorrectly perceiving social norms about numbers of sexual partners or sex-seeking on apps could be used to design interventions. Lessons could be learnt from research with online drug forums that reveals users share many methods and strategies to stay safe and maximise positive outcomes of use (Boothroyd and Lewis, 2016; Hearne and Van Hout, 2016). These popular cultures of “best practice” are rooted in user experience and people’s own know-how (Boothroyd and Lewis, 2016) (Van Hout and Hearne, 2015). Understanding indigenous harm reduction practices can offer an alternative for public health interventions (Hearne and Van Hout, 2016). Co-production of guidance on how to stay happy and healthy on GSN apps could work with veteran app users to utilise this knowledge, ensuring it is grounded in real experience.

The functionality of GSN apps and the social norms appear to have developed in parallel, with the technology influencing behaviour at the institutional and community level, with partial agreement between survey and interviews. Behaviour differs between dating websites and apps (Jung et al., 2019) and the technology itself plays a key role in how people behave on GSN apps. There was a reinforcing relationship between the functionality and design of apps, type of people using an app and expected outcomes. Apps that promoted quick connections, focused on looks and allowed exchange of explicit photos were mainly used for casual sex; thus, men were confident that the normative behaviour on Grindr was sex-seeking. This confirms the existing

evidence which shows men associate Grindr with casual sex and those who do not use it solely for casual sex or hook-ups feel there is something wrong with them (Licoppe et al., 2016; Jaspal, 2017). The purpose of specific GSN apps was less clear for women, probably because there are fewer apps so less choice. Women played more of a numbers game choosing the apps that were most popular in their area or using multiple apps.

Health promotion on apps (i.e. pop up adverts for sexual health services, HIV testing or promoting condom use) were felt not to influence the behaviour of the men themselves who took part in interviews. However, most felt it would influence other people's behaviour and would likely encourage condom use at the time users were arranging to hook-up. Few men had seen outreach profiles. Although theoretically apps would be a good place for interventions (Bailey et al., 2010; Muessig et al., 2015) and MSM are open to such adverts (Kesten et al., 2019), there is still little evidence on the efficacy of health promotion adverts or profiles that offer outreach and health advice (Sun et al., 2015; Huang et al., 2016a; Rosengren et al., 2016). More research is needed to explore the efficacy, cost-effectiveness and accessibility of GSN app-based interventions. None of the GSN apps used by WSW allow any adverts or outreach profiles so women were not asked questions about this. Further research could explore the feasibility of this as advertising functions of women's apps may change.

Policy level influences were absent from the discussion with participants, most likely because they themselves did not think at this macro level. However, some other issues could be considered. A minority of participants who went to religious schools reported they had not had comprehensive sex and relationship education at a young age; the lack of state mandated comprehensive, inclusive education may have influenced their knowledge and behaviour about sexual identity and safer sex. This study was based in two areas with relatively liberal societal attitudes to homosexuality. In another area it is likely the wider legislation may have been more important to participants.

#### **8.3.4 Explore what, if any, strategies app users may employ to maximise positive outcomes, ensure their safety and reduce risk to health (Objective 4)**

The interviews explored what, if any, health-protecting behaviours people use to increase the benefits and reduce risks identified in objective 2. Due to the nuance of such behaviours, this objective was mainly addressed in the interviews rather than the survey. Study findings highlighted that participants already have strategies and rules in place for how they use GSN apps. These fell into four main approaches: avoiding certain types of profiles; taking breaks from apps; efforts to reduce sexual risk, and; plurisexual women being more cautious of men.

Table 8.5: Themes from objective 4: Strategies to balance risks and benefits

Theme	Survey	Interviews	Findings	Convergence
<b>4.1 “Faceless” profiles were a red flag and generally avoided</b>	✓	✓	<p><b>Survey:</b> Main worries in open text survey box was about dishonesty and catfishing. Half of men and women who responded to this question were worried people on apps were not who they said they were.</p> <p><b>Interviews:</b> Faceless profiles were common on men’s apps but rare on WSW apps. All participants said they would avoid them or at least want a face photo within a couple of messages. Concern for faceless profiles was mainly about catfishing, attraction, connection and knowing who they were talking to; for some it was a safety issue. For men, they also worried such app users were in the closet; this was rarely mentioned by women.</p>	Partial agreement
<b>4.2 Men avoid chemsex and users who mention chemsex</b>		✓	<p><b>Survey:</b> No questions about drugs &amp; alcohol on survey</p> <p><b>Interviews:</b> Most men, especially older men, had seen references to chemsex on dating profiles. None of them were interested in chemsex and most actively avoided profiles that mentioned it. Chems users were perceived to be higher risk as they had multiple partners and might not use condoms as consistently.</p>	Silence
<b>4.3 Stopping using/ deleting/ taking a break from some or all apps is common</b>	✓	✓	<p><b>Survey:</b> A third of men had previously had Grindr but deleted/stopped using it; 40% of women had used and then deleted Tinder. Participants were not asked why they had stopped using apps.</p> <p><b>Interviews:</b> A common theme was participants (all genders, both areas) deleting or uninstalling apps as a coping mechanism. A third of people had deleted an app or all apps after getting annoyed or frustrated with how apps made them feel or as a reaction to creepy or negative comments, harassment or just as a “mental health break”. Most people used apps in a cyclical way, having a break then re-downloading after a few weeks/months and having another similar experience on apps.</p>	Partial agreement
<b>4.4 Men do not necessarily trust info on Grindr profiles about HIV status/testing/PrEP</b>		✓	<p><b>Survey –</b> No questions</p> <p><b>Interviews:</b> Most men thought it a good thing that Grindr profiles could include info on HIV status and testing, however, most would not trust the information and would still insist on condoms. There were mixed opinions on whether PrEP users were a higher or lower risk sexual partner with some judgemental and uninformed attitudes displayed.</p>	Silence

<b>4.5 Men are concerned about their sexual health. Although condom use was inconsistent, they are using sexual health harm reduction strategies</b>	✓	✓	<p><b>Survey:</b> No questions on survey about safer sex. However in the open text box, men mentioned STIs and HIV as something they worry about when using apps</p> <p><b>Interviews:</b> Fear of contracting HIV was an underlying reason alluded to for condom use. Men avoided profiles that they judged to increase the risk of STIs and HIV, for example those that mention barebacking. However, these judgements were not always well-informed, for example some people said they would avoid PrEP users as they felt they were more high-risk sexual partners. Men confident to discuss condoms, either when arranging hook-up or just before sex. However, condom use was somewhat inconsistent for men, even for casual hook-ups, though most reported harm reduction behaviour such as asking partners about testing, avoiding HIV positive users, took PrEP or avoiding anal sex.</p>	Partial agreement
<b>4.6 STI/HIV screening more common in men, CT and those with more frequent sexual partners</b>	✓	✓	<p><b>Survey:</b> no significant differences between time since last STI or HIV test for men in CT compared to men in MS, or women in CT compared to women in MS. Those who have had HIV or STI test in last 12 months had a significantly higher number of overall and app partners in previous 12 months.</p> <p><b>Interviews:</b> Men reported more regular screening and this being part of their routine, women had less regular screening or had never had an STI test. Not all participants who were using apps for casual sex and hook-ups were testing regularly and minority of participants who discussed a high number of sexual partners had never had a sexual health screen. Although small number, all people who had never had a sexual health screen were from Merseyside (2M/3W).</p>	Partial agreement
<b>4.7 Women perceived sex between women to be very low risk &amp; reported little protective behaviour</b>		✓	<p><b>Survey:</b> no questions on survey about safer sex. No women mentioned anything sexual health related as a worry or negative experience of sex – however some men did.</p> <p><b>Interviews:</b> Most women discussed how they, and most other WSW they knew, regard sex between women as very low risk for STIs. Less than half discussed their own occasional safer sex behaviour (mainly condoms on shared sex toys), however the use of barrier methods for skin-to-skin contact was very rare.</p>	Silence
<b>4.8 Plurisexual women were generally more cautious with men (interacting on apps, meeting, dating and sex), compared to lesbian women and all men</b>		✓	<p><b>Survey:</b> A higher proportion of women (29%) than men (5%) used apps to also meet opposite-gender partners. However, no questions asked about differences between dating/meeting men compared to women.</p> <p><b>Interview:</b> Plurisexual women were more cautious when talking to men on apps and when arranging to meet up in real life; men were perceived as more forward, threatening and potentially violent (both on apps and when meeting up). Some OKCupid users set the app to filter out cis men and other plurisexual women did not use apps to meet men. Women who also had sex with men reported different attitudes to sex with men and women, they were more concerned about health consequences of sex with men (STIs, unplanned pregnancy) than with sex with women. All plurisexual women reported they would always use condoms with men but rarely any protection with women.</p>	Silence



Firstly, people avoided interacting with certain types of app user. Avoiding faceless profiles was a way to reduce the chance of deception and catfishing, which in turn reduces physical risk (e.g. violence) and emotional risk (e.g. being disappointed or hurt). The limited qualitative literature on GSN app use by MSM and WSW indicates these fears are common in app users and users protect against this by not giving out too much personal information on apps and will carefully examine photos before meeting (Albury and Byron, 2016; White Hughto et al., 2017; Lauckner et al., 2019; Numer et al., 2019). Some apps have stricter rules about anonymous profiles and some include options to link to other social media. However, none of these are mandatory and unlikely to ever become mandatory on LGBTQ+ GSN apps due to fears about safety, anonymity and homophobia. Participants in this study further reduced risk by Googling and searching other social media (Facebook and Instagram) before agreeing to meet up. Guidance and encouragement for GSN app users to do this as standard could increase this behaviour and reduce safety risks.

Previous evidence showed chemsex is common and often facilitated through apps such as Grindr (Schmidt et al., 2016; Curtis et al., 2020; Patten et al., 2020); however, men in both CT and MS actively avoided any profiles that referred to chemsex. This may have been due to the age group of the participants (generally younger) and chemsex is associated with older age groups (usually aged over 30; Maxwell et al., 2019; Blomquist et al., 2020). However not all participants, especially the younger ones, knew some of the coded language used to refer to drugs on apps. The strategy to avoid any profiles referring to, or even hinting at, chemsex is encouraging – health promotion could build on this by educating people about the terms used and subtle clues to watch out for.

Secondly, referred to as “mental health breaks” by one interview participant, it was common to delete or avoid apps for a period of time. Many interview participants cycled through using apps, finding they were negatively impacting on mental health, deleting them only to reinstall and use again a few weeks or months later. This finding has not been seen in the evidence so far, despite being common in both CT and MS. These breaks allowed people space from apps and the negative effects on their mental health, and opportunity to build up their resilience. Resilience helps people adapt and cope with stress and can be increased by social support (Hill and Gunderson, 2015; Meyer, 2015). Promoting having a break from GSN apps when the negative impacts outweigh the positives could reduce the effects on mental health and allow users opportunity to build up resilience again before using them.

Thirdly, men were generally concerned about their sexual health and took more measures than WSW to reduce harm including condom and PrEP use, STI/HIV screening, serosorting, and distrust of Grindr profile info about HIV/STI status/testing info. As with previous research on sexual health, lesbian women were the least concerned about STIs, used few barrier methods and were having the fewest STI screens/HIV tests (Bailey et al., 2003; Marrazzo et al., 2005; Richters et al., 2010; Gorgos and Marrazzo, 2011; Lindley et al., 2013). The sexual health protective behaviour of MSM in this study was very encouraging. Although men in the interviews did report some inconsistent condom use, all practiced harm reduction including only having oral sex, using PrEP, serosorting, only having CAI with a monogamous partner and making decisions about condom use based on their role in sex. Promotion on apps for MSM and elsewhere that reinforces these harm reduction behaviours, especially the promotion of condom use or PrEP, could reduce any risk by reminding men about condoms at

the point they arrange the hook-up. No apps promote or provide information on safer sex for WSW and they are often left out of all health promotion, government policy and general conversations about sex (Power et al., 2009; Formby, 2011). At this point, *any* sexual health promotion and information about safer sex for WSW would be better than the current situation.

Of concern were the five interview participants (2M, 3W, all MS) who had never had a sexual health screen; one of the men reported high numbers of sexual partners. Fear of attending a clinic was the main reason the two men had not been screened and perception of no risk the main reason for the women's non-attendance. Outreach on apps by local sexual health services could alleviate these fears. There are specific LGBTQ+ health services in CT and MS. Signposting to these local services and encouraging app users to ask questions about such services could encourage nervous users to attend local LGBTQ+ health services such as The Green Room in Liverpool<sup>42</sup>, sexual health clinics at the Hartford Gay & Lesbian Health Collective<sup>43</sup> or HIV testing at APNH in New Haven<sup>44</sup>. There have only been a few studies published on outreach on apps, but such outreach appears to increase uptake of local sexual health services (Sun et al., 2015; Lampkin et al., 2016).

Fourthly, plurisexual women were highly cautious of talking to men on apps, meeting them in person and safer sex, compared to lesbians and MSM. Lesbian women and women who only had sex/relationships with women were the least cautious about using apps, the main concern being the women they go to meet might turn out to be a man. These fears or negative experiences has led some plurisexual women interviewed to avoid meeting men through GSN apps. Plurisexual participants in the survey were the least "out" about their sexual orientation so may not have been as open about dating women, which may have safety implications if they are less cautious when meeting women and not telling anyone about these dates. The behaviour of plurisexual women on GSN needs further investigation, especially as bisexuals experience worse physical and mental health outcomes than their heterosexual or gay/lesbian counterparts (Dilley et al., 2010; Colledge et al., 2015; Booker et al., 2017).

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<sup>42</sup> Weekly MSM focused sexual health clinic at the Royal Liverpool University Hospital

[www.rlbuh.nhs.uk/departments/medical-specialisms/axess-sexual-health-clinic-testing-and-booking/the-green-house/](http://www.rlbuh.nhs.uk/departments/medical-specialisms/axess-sexual-health-clinic-testing-and-booking/the-green-house/)

<sup>43</sup> The HGLHC provides medical services, dental services, support groups, and health education for LGBTQ+ people in the CT state capital. [www.hglhc.org/](http://www.hglhc.org/)

<sup>44</sup> APNH provides services for those who face stigma or challenges in receiving culturally competent care, including HIV testing, support groups and education. <https://apnh.org/>

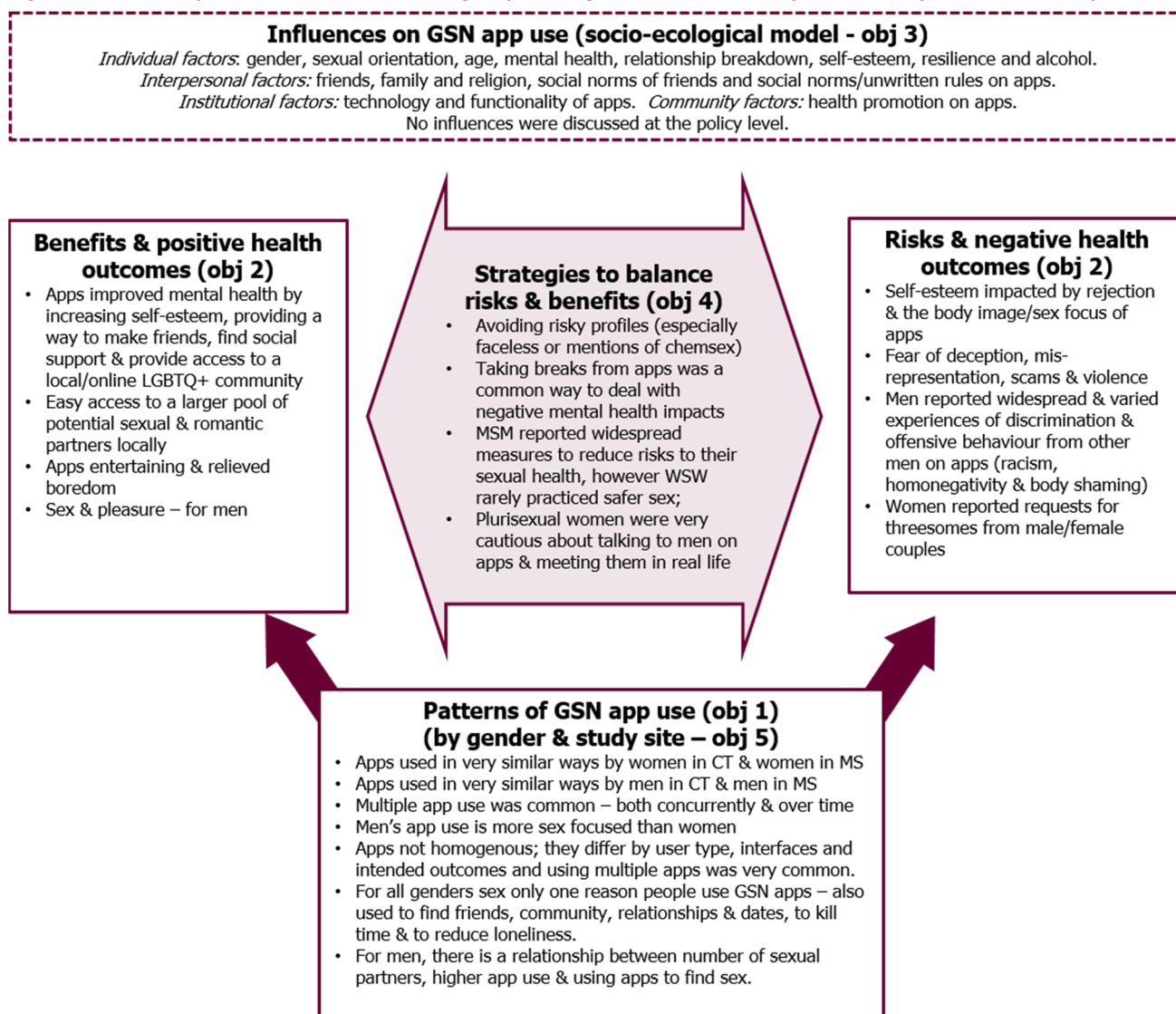
## Chapter Nine | Conclusions

This chapter will draw conclusions from the research and discuss the study's limitations. The chapter ends with recommendations for practice, app companies, app users and for research. This thesis was submitted in September 2020 whilst the UK was still in partial lockdown due to the global coronavirus pandemic – therefore the potential impact of this huge public health crisis is also briefly discussed in this chapter.

### 9.1 Revisiting the research objectives

To improve health of GSN app users we need a thorough understanding of the behaviours and factors that may influence their health outcomes. Understanding health behaviours is the first step in the process of developing health interventions and designing health improvement efforts that are most likely to be effective (Michie et al., 2011). This research aimed to gain a deeper understanding of how lesbian, gay and bisexual people behave on GSN apps, how app users perceive the impacts on their health and how people manage their health. The conceptual model presented at the end of chapter 2 has been revisited and updated with the findings from this research (figure 9.2).

Figure 9.2: Conceptual framework including key findings from this thesis (research objective numbers)



### 1. Understand patterns and motivations for using GSN apps by people seeking same-gender relationships/sexual partners in Merseyside and Connecticut. (Studies 1 and 2)

Men in CT and men in MS had similar patterns of use. Women in CT and women in MS had similar patterns of use. Apps should not be treated as homogenous; they differ by user type, functionality and intended outcomes and using multiple apps was very common. Having several motivations for using apps was also very common, over time and concurrently; these included looking for friends, community, relationships and dates, to kill time and to reduce loneliness. Sex was only one of the reasons people use GSN apps. There was an association between reasons for using apps, intensity of app use and risky behaviour for men, however cause and effect is unclear.

### 2. Investigate how people in Connecticut and Merseyside who use GSN apps view the benefits of apps and any potential health risks. (Studies 1 and 2)

There were many perceived benefits to GSN app use including boosts to mental health through positive online interactions, improving self-esteem and providing access to LGBTQ+ community and friends. Apps provided easy access to a bigger pool of sexual and romantic partners nearby, which may increase happiness or lead to more satisfying relationships. Apps were entertaining and often used to relieve boredom and loneliness – for men this linked in with sex (exchanging photos, masturbation etc) but not for women. For men pleasurable sexual experiences were also an important outcome of app use.

Negative health outcomes and risks people perceived were effectively the opposite of these benefits. Rejection and the sex-focus of apps was thought to negatively impact self-esteem and thus mental health - the focus on sex-seeking and physical attractiveness was a particular issue for men. All participants were concerned about deception, misrepresentation and dishonesty by other app users, for a minority this led to a fear of potential violence. However, few had experienced any violence or serious deception. Men reported witnessing and experiencing discrimination, racism and homonegativity on apps. The main offensive behaviour reported by WSW was requests for threesomes from male-female couples. The balance of these negative and positive health outcomes was a challenge for some participants; however, for the majority the benefits appeared to outweigh the risks as most continued to use GSN apps.

### 3. Explore what influences how people in Connecticut and Merseyside behave whilst seeking sexual/romantic partners on GSN apps. (Study 2)

The influences on health behaviour were examined through the lens of the socio-ecological model of health (McLeroy et al., 1988) and factors found across most levels of the model. The individual factors affecting behaviour were gender, sexual orientation, age, mental health, relationship breakdown, self-esteem, resilience and alcohol use. At an interpersonal level people were influenced by: friends, family and religion; social norms of friends; and social norms and unwritten rules on apps. At the institutional level the influencing factor was the technology and app functionality and at the community level health promotion on apps can influence behaviour. No influences were discussed at the policy level, possibly because participants may not be able to understand how local, state or national policies affect them personally.

4. Explore what, if any, strategies GSN app users in Connecticut and Merseyside may employ to maximise positive health outcomes, ensure their safety and reduce risk to health. (Study 2)

All participants had strategies and rules in place for themselves. They avoided certain profiles - specifically faceless profiles or any that mentioned chemsex. Men used harm reduction measures to protect their own sexual health, including condom use, PrEP and serosorting. WSW were least concerned about the sexual health risk involved in sex between women. Plurisexual women were the most cautious on apps and very sceptical of men, both on the app and when meeting in real life. For all participants deleting or avoiding apps, either permanently or temporarily, was a common tactic when the negatives outweighed the positives and users needed a break.

6. Examine any differences and similarities in behaviour between study sites in the UK and USA, gender groups and sexual orientation groups. (Studies 1 and 2)

Men in CT and men in MS use apps in very similar ways. Women in CT and women in MS use apps in very similar ways – therefore we can assume the US evidence from liberal states and metro areas may be applicable in similar areas in the UK. The large difference was between men and women, not surprisingly. Men used apps in a more sex focused way, had more casual sex and more sexual partners. Men were also less concerned about their physical safety. There were also differences between lesbian women and plurisexual women (lesbians less concerned about safety, negative health outcomes or violence) and between how plurisexual women interacted with men and how MSM interacted with men (MSM more sex focused, less concerned about violence or safety). However, the influences on health and strategies of use were very similar for men and women; the main differences related to sexual behaviour. The increasing North American evidence base about how MSM use GSN apps is likely to be relevant to MSM in the UK. However, there is still very little evidence about WSW, and none of it from the USA. This study presents the first study looking at these issues in depth for WSW.

## 9.2 Limitations

The limitations of the individual studies are discussed in detail in sections 5.10.8 and 7.4.7. This section will discuss the key limitations of this mixed methods study as a whole and how these may have influenced the overall findings.

The biggest challenge with this research was sampling and recruitment and how this has affected generalisability. As with much health research with LGBTQ+ populations, without a reliable sampling framework, this study had to rely on purposive sampling (Prah et al., 2016; Hickson et al., 2017a). It is very challenging to conduct population-based probability sampling amongst hard to reach groups like this one. This is less of a concern for qualitative research which is not aiming to be as generalisable or representative, however, it was a limitation of the survey. The recruitment through commercial Facebook advertising was intended to overcome some of this bias by researching a broad random sample, albeit only amongst Facebook users. However, due to the obstacles put in place by Facebook this recruitment method had to be abandoned and the secondary approach was purposive sampling through community advertising, much of it online (see reflection box 4.4). This is likely to have introduced bias to the results. The second drawback of Facebook ceasing to approve the recruitment ads was the small sample size, especially in Connecticut. This meant fewer conclusions could be drawn from the quantitative phase and it ended up being more “small quants, big quals” than originally intended

(Creswell and Plano Clark, 2011). The small sample size also reduced the reliability of the cross-cultural comparisons which undermines the objective to understand if behaviour in the two countries is similar enough for us to generalise findings from previous USA studies to the UK. However, the interviews revealed almost no difference between behaviour of men in CT and men in MS or between women in CT and women in MS – so we can be relatively confident much of the evidence is transferable.

Another important limitation of this research was that it was not able to represent the experience of minorities within the wider LGBTQ+ community; namely trans and non-binary people and people from BAME groups. This research did include one trans and two non-binary participants, however the focus was mainly on people who used GSN apps to meet “same-gender” partners. As discussed in section 3.3 this may, unintentionally, imply that gender is binary and may have excluded trans people. For the survey analysis those who identified as a gender other than man or woman could not be included in much of the analysis by gender. This was disappointing given the challenge in recruiting a large enough sample. Another issue was that to conduct thematic analysis, the two non-binary individuals had to be grouped with other participants; the one non-binary participant who used apps to meet men was analysed with men who used GSN apps, and the other non-binary participant who used apps to meet all genders was grouped with the participants who used apps to meet women or men and women. Whilst not ideal it was the best way to avoid this data being excluded. Trans men and trans women experience transphobia, ostracisation, fetishisation, prejudice and exclusion on Grindr (Lloyd and Finn, 2017; Shield, 2018). Trans users of GSN apps struggle to navigate the safety of disclosing their gender identities (Fernandez and Birnholtz, 2019) and there is a dearth of research into the other sexual health needs of trans people who use GSN apps (Albury et al., 2020). The experiences of trans persons on GSN apps are likely to be complicated by the intersection of sexual orientation and gender identity with a technology that often relies on binaries (e.g. like or dislike, male or female). The experiences and health outcomes of trans, gender diverse and non-binary GSN app users warrants further specific research.

Although participants in both studies came from a diverse range of ethnic groups, numbers were relatively small, and most analysis could not be broken down by ethnicity. In both the UK and USA, people from BAME groups experience health inequalities, including higher rates of STIs and HIV for MSM (Hickson et al., 2017b; Centers for Disease Control and Prevention, 2019; 2020), and in the USA black MSM appear to use different apps to white MSM (Duncan et al., 2018b). These inequalities are likely to be exacerbated by the widespread racialised sexual discrimination reported in this and other studies (Callander et al., 2016; Shield, 2018; Thai, 2020). Further research is needed to understand the health and experiences of LGBTQ+ app users from BAME groups, especially in the UK.

LGBTQ+ research has been criticised for the homogeneity of recruiting mainly white, middle-class, young, able bodied, well-educated and urban populations (Greene, 2003; Fish, 2008). The recruitment methods of this study did try to ensure as diverse a sample of participants as possible and the final qualitative research included trans and non-binary participants, those with physical disabilities and mental-illness, people from BAME groups and neuro-diverse individuals.

The CT respondents were generally clustered in the New Haven County area due to very limited public transport in CT – not having a car made things very hard for the researcher. The survey was publicised across the whole

of CT, including by an LGBTQ+ organisation in Hartford, the state capital, 40 miles north of New Haven. However, networks were mainly built up with LGBTQ+ organisations in New Haven as they were practical to visit. Most of the interviews were focused around the New Haven County area of Connecticut, many recruited through staff and student networks in universities. Only one online video interview was conducted. This may have biased results as New Haven is home to an Ivy League university which one participant described as a “a very queer college”.

### **Reflection box 9.1: What I would do differently next time?**

Some parts of this PhD process were extremely frustrating and challenging. The difficulty recruiting to the survey was the most soul-destroying experience. I put in so much effort but still ended up with a small sample in CT. If Facebook had not closed down my advertising options the CT sample size would have been larger, however I was unlikely to reach the target through Facebook alone as the CT cost per completion was so high.

Broader inclusion criteria for the survey would have increased response rate and would likely have bypassed some of the rules of Facebook advertising (e.g. not allowed to advertise to single people). For example, a PhD student in my department who promoted their survey through Facebook a couple of months after me got over 3,000 responses to their general sex and lifestyles survey with LGBTQ people across the whole of the UK (Hibbert et al., 2019b).

I did not want to compare app users against non-users so did not recruit all LGBTQ+ people. Recent use of GSN apps is very common amongst MSM (89% in Paris, 65% in Ireland and 76% in some young Black men in USA (Duncan et al., 2018b; O'Connor et al., 2018; Dangerfield et al., 2020)); the interesting question is not “do you use apps?” but “how do you use apps?”. However, by phrasing the recruitment ads to target only app users it may have made things too complicated to those reading the advert, as well as causing problems with Facebook’s frustrating and inconsistent rules. If GSN app use is so common, maybe an advert recruiting any LGBTQ+ people would have got a much larger sample size – and I could have just excluded those who did not use GSN apps. I chose to target app users to make it recruitment more cost-effective but this might have backfired.

If doing this again I would consider widening the recruitment area to the north west of England not just Merseyside – there are a number of LGBTQ+ organisations in Manchester that might have also helped with recruitment. However, comparing a county of the UK against one state in the USA felt more appropriate. Having a larger sample size would have allowed me to explore the data further, have greater power to examine relationships, and allowed me to further develop my quant skills.

## **9.3 Recommendations**

This section makes recommendations, derived from the findings of this thesis research. These are discussed in relation to three groups - health practitioners and public health organisations; GSN app companies and developers and app users themselves. These recommendations cut across multiple levels of the SEM, not just focusing on individuals’ behaviour, and aim to encourage systemic change (Golden and Earp, 2012). For example, educational interventions designed to change beliefs or skills (e.g. knowledge about PrEP or condom use) are likely to work better when environment and policies support these behaviour changes (Sallis, 2008). Recommendations for future research are also made.



### 9.3.1 Health practitioners and public health organisations

- GSN apps can provide an opportune moment for providing information about safer sex, just as users are organising to have sex. Further health promotion on apps is likely to be acceptable to MSM - both outreach profiles which interact with users and pop-up adverts. Co-production of these resources, building on existing strategies are likely to increase acceptability for app users:
  - Outreach profiles run by sexual health services or LGBTQ+ organisations can signpost to local sexual and mental health services. Outreach and sexual health workers on apps can answer questions, alleviate fears about testing and provide detailed information about local services. For example, many sexual health clinic websites already include a step-by-step guide to what happens when you attend and signposting to these on apps should reduce fear.
  - More targeted commercial pop-up adverts on apps could encourage condom use and PrEP uptake, inform users about free home STI/HIV testing and provide links to local health service information.
  - Presence of sexual health/LGBTQ+ organisations and relevant adverts on GSN apps can begin to change the normative culture on apps to ensure sexual health is talked about openly and positively alongside sex-seeking behaviour.
- Sexual health staff need education on GSN apps and may need to ask patients about their app use and where people meet partners. This would be an opportunity to discuss harm reduction strategies, based on the strategies participants already employ, and also provide advice about alcohol use when going to meet partners, safer sex, protecting mental health and reducing chance of violence/crime. Professionals would need to ensure any discussion of GSN app use is non-judgemental and sex positive.
- Promote resilience and coping skills within the LGBTQ+ community and to app users. This could help people navigate app use post-relationship breakdown, cope with rejection and deal with the sex-focus and objectification on GSN apps. Increasing resilience and reducing minority stress is likely to reduce health inequalities.
- Continue to raise awareness about PrEP and provide multiple referral pathways for MSM to access free PrEP. There are still misconceptions about PrEP and although some Grindr users state on their profile that they take PrEP, the stigma and ignorance mean this information is not always understood. Adverts on MSM apps could provide basic information and correct misinformation as well as signpost GSN users to PrEP providers. Many of the interview participants were university students and some had poor understanding of PrEP. Links between public health organisations, sexual health services and university LGBTQ+ societies could improve this knowledge and increase uptake of PrEP in younger groups.

### 9.3.2 GSN app companies and developers

- Some apps already offer reduced or free adverts to charities and community organisations to do health promotion, however not all apps do this. GSN apps should work with charities and services to encourage and promote local sexual health outreach profiles. This could improve the corporate image of the companies as well as improve health.
- Apps themselves need to take more responsibility to reduce racism and offensive behaviour on apps. Most apps have policies about hate speech, discrimination and couple profiles; however, this type of behaviour

is still widespread, so these policies do not appear to be strict enough or are not enforced. Apps already filter out and do not allow profiles with some specific terms relating to illicit drugs (e.g. certain emojis or words). This approach could be taken to stop terms relating to race/ethnicity, homonegativity or body shaming showing up on profiles - e.g. writing "no Asians" or "no fat guys" in your profile could flag up a warning saying this language is not allowed.

- Premium (paying) users of most GSN apps do not get any adverts – which means they will not see any health promotion adverts either. The approach needs to be examined by app companies to understand if this is something that users want and consider if premium subscribers may also want selected health promotion messages.

### 9.3.3 Users of GSN apps

- Take breaks from apps when you feel they are getting too frustrating, annoying or addictive. Learn the warning signs that the negatives are beginning to outweigh the positives and take some time away from the app – if you don't want to uninstall the app you can mute notifications and hide the app in a subfolder.
- Be aware how you behave on apps also affects other apps users' self-esteem and happiness. Be positive, talk about what you like, not what you do not like. Think about how you phrase your preferences, avoid reference to race or ethnicity and if someone is not your type respond in a kind and polite way.
- Talk to your friends about how you all use apps, help each other out, tell stories and share experiences. But be honest. If you are harassed or upset by another app user, advise your local friends who use the same app so they can consider avoiding that user. Remember friends might be looking for something else or might find it easier to brush off negative comments – don't compare yourself to your friends or other app users. There is no "right way" to use apps.
- Read the app's community guidelines and use the security features to report users who are offensive, racist or breaking these guidelines – even if it isn't directed specifically at you. People will continue to behave like this unless they are called out. If the app doesn't do anything make a complaint. The apps themselves are unlikely to crack down on systemic offensive or racist behaviour without pressure from their customers.
- Be careful when using apps after you have drunk alcohol. Alcohol lowers inhibitions and the decisions you make won't always be the same as you would sober. This is especially important when it comes to personal safety, potential violence and safer sex. If you are going to meet someone from an app when drunk tell someone you know where you are going.

### Reflection box 9.2: Will app companies change?

This programme of research has identified some harmful behaviour of app users; discrimination, harassment and offensive behaviour on MSM apps and requests for threesomes for WSW. All these behaviours are against the policies or community guidelines of the apps. Yet, the ubiquity of these experiences shows these rules are clearly not enforced.

This thesis has made recommendations for the companies that own and run the technology on which people are behaving in offensive, racist and aggressive manners. Apps themselves are commercial, profit-driven organisations. Although some may have social responsibility policies, within our capitalist system, these organisations are focused on making money. Most of their revenue comes from adverts and the more users they have the more profitable the advertising space. If this offensive behaviour is the norm on apps and driven by users, why would apps risk losing users by cracking down on it?

An example of commercial interest driving the agenda is Grindr. The Kindr Grindr (2018) and Grindr for Equality (2019) activities of the organisation claim to be inclusive, anti-racist and encourage users not to discriminate. However, Grindr users who pay for the premium service are still able to filter their search by ethnicity/race – they can choose to globally reject all Asian or black men if they want. This contradiction reminds us that although the apps may want people to be kind, they are likely to remain focused on what drives profit. I understand people have “preferences” and “types” and even in a bar may appraise potential partners based on ethnicity; however, somehow it feels worse to build a filter into technology to universally reject all people of a specific ethnicity. But then maybe I am just naive.

We have seen from the Public Health Responsibility Deal in the UK that it is ineffective to rely on businesses to voluntarily change products to promote health. The alcohol and food companies who were part of this government-industry partnership were self-regulating and only adopted voluntary agreements that would not risk negatively affecting sales or consumer behaviour (Knai et al., 2018).

Without wanting to sound pessimistic, in this capitalist society it is unrealistic to rely on the GSN apps to change their policies without bottom-up pressure from customers.

### 9.3.4 Recommendations for further research

- Longitudinal research is needed to examine the causal relationship between app use and sexual behaviour. Examining how behaviour may change over time will contribute further to our understanding of the relationship between intensity of sex-seeking and app use.
- Mapping the current practices and policies of health promotion on various apps to identify gaps and opportunities. This needs to be examined across large urban *and* rural areas as LGBTQ+/sexual health charities tend to be based in more populous areas and fund outreach and adverts locally. It is unclear if there is any outreach work with WSW on any GSN apps.
- Further evaluations are needed of the efficacy and cost effectiveness of app-based promotion, both outreach and paid for pop up adverts. Many small organisations (e.g. LGBT Foundation in Manchester, APNH in CT) are doing informal outreach on various apps but this is not published or robustly evaluated.
- Quantitative research into the social norms of app use and individual apps. There is evidence that social norms are misinterpreted (not everyone is seeking sex) so understanding the norms on specific apps could be used to design interventions to correct any myths.

- Specific research is needed on the experiences and health outcomes for trans, gender diverse and non-binary users of GSN apps. It is not clear how they navigate the binary nature of most apps or their experiences on apps, especially given the higher rates of discrimination, violence and mental ill-health already experienced by this group.
- Further research is needed to understand the health behaviour of British LGBTQ+ GSN app users from BAME groups. The intersection of ethnicity and sexual identity means this group experiences even worse health inequalities than their white counterparts. There is an increasing evidence base showing young black MSM in the USA use different apps and exhibit sexual risk-taking behaviour, but there is no research with this group in the UK.
- A better understanding is needed of the behaviour of plurisexual women on GSN apps as they are likely to be particularly vulnerable. Further research is needed to measure their health outcomes and understand the strategies they use to stay healthy and happy on apps.
- We need a better understanding of how WSW define hook-ups and casual sex between women as the terms used by MSM are unlikely to be relevant to WSW. This is especially important for plurisexual people as they might have a different definition depending on whom they are having sex with.

## 9.4 GSN apps, LGBTQ+ health and coronavirus

Given large sections of this thesis were written during the COVID-19 lockdown it is important to acknowledge the potential impact the pandemic and social distancing rules may have had on GSN app use, sexual behaviour and risk. In a population already at greater risk of mental ill-health and social isolation (King et al., 2008; Institute of Medicine, 2011; Mercer et al., 2016), self-isolation or government-imposed laws may have an even more detrimental effect on LGBTQ+ people. Media reports show use of GSN apps increased during the first month of COVID-19 (Brennan et al., 2020). However, for those abiding by government rules, meeting face-to-face would be impossible – which might have changed how people used and communicated on GSN apps. During the easing of lockdown one UK HIV charity released guidance on how to reduce risk of COVID-19 transmission during sex including: focusing on solo-, phone- or cam-sex; discussing risk with partners; only having sex with regular partners; washing hands; wearing masks and not kissing; using condoms and dental dams; and avoiding face-to-face sex positions (Brady, 2020).

In the UK and North America some sexual health clinics were classed as “non-essential” health services and shut or dramatically reduced services during the pandemic (BASHH, 2020a; Brennan et al., 2020). LGBTQ+ charities, which provide invaluable social support also had to reduce or close services and many are facing financial problems as a result of the pandemic (Consortium, 2020). Understanding the relationship between GSN app use, the pandemic and mental/sexual health in the LGBTQ+ population will help planning for future pandemics.

Just before submission of this thesis, whilst the UK was still in partial lockdown, the government announced that PHE would be restructured and replaced by a new National Institute for Health Protection. Leading sexual health and HIV organisations have responded with concern. It is unclear if or how the new institute, which

appears to focus on health protection and responding to pandemics, will continue to lead on HIV and sexual health prevention and policy work (BASHH, 2020b).

### **Reflection box 9.3: Gender and sex within this programme research**

The conflict between a focus on the gender or sex of participants has been an issue throughout this PhD research. Sex and gender are different concepts and should not be used interchangeably. Sex is defined as biological aspects of an individual as determined by their anatomy, which is produced by their chromosomes and hormones; sex is assigned at birth and usually refers to male or female. Whereas gender is a social construct that relates to behaviours, one's internal perception and how one sees oneself as a man, woman or another gender identity (Tollard and Evans).

In Chapter 3 and Reflection Box 3.2 I discussed the challenge of deciding who exactly this research was targeted at; this is something I still don't feel I fully resolved by the end of the whole process. However, I do not think there is actually a "right answer".

In both studies, approximately 10% of participants were not cisgender. Two interview participants were non-binary and one was a transwoman, and 22 survey respondents indicated their gender was different to the gender assigned at birth. This was particularly common in Connecticut, where 22% of survey respondents reported a trans history (compared to 5% in Merseyside).

In retrospect, it would have simplified things to include only cisgender people who were using apps to find same-gender partners. This would have made analysis simpler, focussed on issues of sexual orientation and allowed more survey questions that relied on risk and safer sex (because I could be more confident about genitalia). However, in a community where sexuality and gender lines are often blurred this would have caused some challenges with recruitment. Almost a quarter of CT survey participants were not cis, if they were excluded from analysis the sample would have been even smaller and uneven with MS. Alternatively, if I had worded the recruitment materials to only target cis participants it is likely it would have been more complicated to read and possibly confused some eligible participants. Targeting only cis participants may also have alienated potential participants by appearing like I was excluding large parts of the queer community.

I am very aware that research is not apolitical. Although research needs to be specific about population groups and cannot include everybody, in the queer community, especially in CT, it is often impossible to separate different identities within the LGBTQ+ community. Even if individuals themselves cis, they may date or have sex with trans or non-binary people. Research and public health discussion often focus on a wider LGBTQ+ community, and many individuals see themselves as part of a broad queer community. Narrowing research on only cisgender individuals could be seen as further discriminating against trans and non-binary individuals. Indeed, whilst I was promoting the online survey a non-binary intersex participant in CT sent me a message commenting on the wording of the survey explaining it made them feel excluded because they were unable to answer some questions. As a member of the LGBTQ+ community, the last thing I want to do is make anyone feel like they are being discriminated against.

This complexity and breadth can be accommodated and discussed within a PhD thesis; it has been an interesting learning curve and it is likely there is no right answer. However, I am currently writing two papers using interview data and I anticipate I will only include the cisgender participants in these articles. I have a large sample of cis participants from which to draw robust conclusions, however, the three non-binary/trans participants are unlikely to be representative of the wider population. It will also be difficult to explore their experiences in relation to cis participants, within the briefer format of a paper.

## 9.5 Final conclusion

The findings of this PhD confirm the patterns of use, perceived risks and negative health outcomes of GSN app use previously reported by MSM in North America, Australia, and China are also experienced by MSM in the UK. Thus, much of the North American evidence may be relevant in the UK as well. This study further develops the evidence and shows that many of the risks to self-esteem and mental health, personal safety and fear of deception reported in previous research with MSM are also experienced by WSW who use GSN apps. The key differences between men and women relate to sex-seeking behaviour and the sex focus of MSM apps.

The findings also add to literature by demonstrating, for the first time, that GSN app users report many benefits and positive health outcomes from their use, especially related to mental health and social support, both of which can ameliorate the impact of minority stress (Meyer, 2015). Reducing minority stress is likely to decrease health inequalities for LGB people so interventions should be developed to promote the social support and possible mental health outcomes of apps. Focusing exclusively on risks of GSN apps may further stigmatise a community that already suffers from much discrimination and heterosexism (Institute of Medicine, 2011; Farvid, 2015).

Participants of all genders use similar strategies to balance the risks and benefits of their app use. Health improvement efforts could be built on these existing strategies. This study examined people's behaviour through the novel theoretical lens of the socio-ecological model of health (McLeroy et al., 1988), demonstrating factors across most levels of the model influence how LGB people use GSN apps. Previous interventions to reduce risk behaviour on GSN apps have tended to focus on an individual level, however, a systems approach (Golden and Earp, 2012) is likely to be needed to address health behaviour on GSN apps. There is a disconnect between the way policy makers and the media discuss GSN apps and the actual experiences of those using apps. This highlights the needs for co-produced health interventions grounded in the experiences of those who use the technology.

### Reflection box 9.4: Final thoughts

At the end of this thesis it feels appropriate to include a final reflection on the process of doing this PhD. I had been a public health researcher for 12 years when I started this full-time PhD. I thought I knew what I was doing; I was confident and probably naive about the process. The scale of the topic, background, theories, methodologies, literature and options were all overwhelming at times. Writing the literature review was particularly challenging, the topic was just so broad – all health issues for all LGB people and how they link with websites, GSN apps, and interventions - and then the evidence base about GSN apps doubled between starting and submitting! Being solely responsible for all parts of a mixed methods study across two countries was hard – I cannot wait to work as part of a research team again. The mental health impacts of this lone working really surprised me...and just when I thought I was at the end of my tether we went into lockdown for five months!

Every time I presented my research or chatted about it informally, I was greeted with enthusiasm, interest and “ooh that’s cool”. Grindr, Tinder, dating and sex are exciting topics. Having spent 7 years working on applied research and service evaluations, I chose a PhD topic I knew would be fun enough to keep me engaged for the three years. Yes, it is fascinating and taboo, but I worried really what were the implications of my research?

When I was in the final six months, trying to wrangle all of this into a coherent thesis, stuck in my house during lockdown away from public health colleagues and supervisors, I began to lose sight of the point of my research. Thinking about the public health implications left me despairing. I adored doing the interviews – they were incredibly interesting, hilarious and heart-breaking - but what did it mean? Was this whole thesis just me being really nosy?

However, once I got over my existential crisis, I remembered fundamentally it comes back to health inequalities. These apps are here to stay. The narrative that they are scary, dangerous and only for the sex obsessed is not helping anyone, and likely just increasing stigma and shame for people who already experience worse health. This study has highlighted various ways apps are actually benefiting health, how they can be used more safely, what is important to app users and how public health can embrace this technology. GSN apps aren’t a passing fad, we need ways to recommend using them in a healthier and safer way.

I have spent a lot of time reflecting on my biases, expectations and ideas about GSN apps, but I don’t really feel they have changed too much through this research. I suspected before I started that some people played this game, sometimes struggling to balance the positives and negatives but I was pleased by how many already had rules and strategies in place. I was encouraged how many people mentioned advice and support from their friends. The old-fashioned view is that technology is making people rude and isolated, but, whilst people still rely on their friends, apps are also creating new communities.



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## **Appendices**

Appendix A: Overview of each app

Appendix B: Introduction to Facebook advertising

Appendix C: Defining sex between two women

Appendix D: Additional recruitment info

Appendix E: Additional tables from Chapter 5 (survey analysis)

Appendix F: Interview consent form

Appendix G: Interview participant information sheet

Appendix H: Interview discussion guide

Appendix I: Thematic analysis coding table

Appendix J: Outness Inventory (Mohr and Fassinger, 2000)

Appendix K: Literature review search criteria

Appendix L: Papers examining GSN apps and health in LGB populations, included in literature review

Appendix M: Questionnaire (including participant information sheet)

## Appendix A: Overview of each app

Info taken from the *About* or *Press* page of each app's website (links in table)

App Name	Main audience	Focus of app	Format/function	Messaging/ contacting options	Launch year	Number of users/ downloads <sup>45</sup>
<b>Tinder</b>	All (various gender options and up to 9 sexual orientations)	<i>"Tinder was introduced on a college campus in 2012 and is the world's most popular app for meeting new people."</i> <a href="https://www.tinderpressroom.com/about">https://www.tinderpressroom.com/about</a>	Profiles (picture and brief text) presented one at a time. User must choose ×/swipe left/dislike or ♥/swipe right/like.	Only if both users choose like/♥ can they communicate. Can't go back to profiles you disliked unless paying premium.	2012	<i>"Downloaded more than 340 million times and is available in 190 countries and 40+ languages. Tinder has 6.2 million subscribers"</i>
<b>Bumble</b>	All	<i>"Bumble empowers users to connect with confidence whether dating, networking, or meeting friends online. We've made it not only necessary but acceptable for women to make the first move, shaking up outdated gender norms. We prioritise kindness and respect, providing a safe online community for users to build new relationships."</i> <a href="https://bumble.com/en/">https://bumble.com/en/</a>	Profiles (picture and brief text) presented one at a time. User must choose ×/swipe left/dislike or ♥/swipe right/like.	Same gender couples anyone can send a message. Opposite genders only women can send the first message. You have 24 hrs to respond to first message or match is lost.	2014	<i>"Over 100 million users across six continents. We've celebrated 1.5 billion first moves".</i>
<b>OKCupid</b>	All (22 gender and 13 orientation options)	<i>At OkCupid, we're dedicated to helping people find love and happiness through meaningful connections. Our one-of-a-kind algorithm matches you on what actually matters.</i> <a href="https://www.okcupid.com/about">https://www.okcupid.com/about</a>	Long profile information and questionnaires. Able to filter and sort results. More like "traditional" online dating website. Uses algorithms to suggest profiles users may like	Anyone can send a message to anyone else	2012 (Website version started in 2004)	<i>"Over 91 million connections made every year"</i> <i>"50K dates made evert week"</i>
<b>HER</b>	WSW	<i>"Award-winning app for dating, chatting and browsing. Use it to meet womxn nearby, stay up-to-date with local LGBT+ events, and read queer news"</i> <a href="https://weareher.com/about/">https://weareher.com/about/</a>	Similar format to Tinder with swiping right to like and left to dislike.  Users can also join "communities"	Similar to Tinder, users can only message if there is a match	Launched as Dattch in 2013	<i>"Meet over 4 million queer womxn"</i>

<sup>45</sup> Each app website seems to report their number of users/matches/profiles/downloads in different ways so it is difficult to compare

<b>Grindr</b>	MSM	<p><i>"Since launching in 2009, Grindr has grown into the largest social networking app for gay, bi, trans, and queer people. We have millions of daily users who use our location-based technology in almost every country in every corner of the planet"</i></p> <p><a href="https://www.grindr.com/about/">https://www.grindr.com/about/</a></p>	Grid of photos, arranged in proximity, closest first. You click on a photo to see associated profile text.	Can message anyone	2009	<i>"millions of daily users"</i>
<b>Scruff</b>	MSM	<p><i>"SCRUFF is the top-rated, safest and most reliable app for gay, bi, trans and queer guys to connect. Founded in 2010, SCRUFF is an independently owned and operated GBTQ business, headquartered in New York City.</i></p> <p><i>Our team connects more than 15M guys worldwide to friends, dates, hookups, events, travel advice, and more."</i></p> <p><a href="https://www.scruff.com/en/about">https://www.scruff.com/en/about</a></p>	Grid of photos, arranged in proximity, closest first. You click on a photo to see associated profile text.	Can message users or "Woof" (express interest in someone)	2010	<i>"Our team connects more than 15 million guys worldwide"</i>
<b>Jack'd</b>	MSM	<p><i>"Join the most diverse community for gay, bi, trans, and queer people around the globe. Inclusivity is at the core of Jack'd, and we believe that everyone should be proud of who they are and where they come from. We all have different backgrounds, body types, experiences, and preferences, and on Jack'd, those differences make us stronger."</i></p> <p><a href="https://www.jackd.com/">https://www.jackd.com/</a></p>	<p>Profiles presented in order of proximity. Users rate each other.</p> <p>Also has a travel feature where users can browse other destinations and around to meet up, RSVP local events, etc.</p>	Anyone can message each other.	2010	<i>"5 million members spanning 2,000 cities in 180 countries"</i>



## Appendix B: Introduction to Facebook advertising

*This document was submitted with the ethics application for study 1*

### Creating a Facebook Page for the study

A “page” was made for the study from which to share adverts. The page included information on the purpose and aims of the study as well as contact details for the researcher. The researcher’s LGBTQ+ and research contacts in the US and UK were invited to “like” the page. The page was mainly used to share posts and adverts related to recruitment. News stories about dating apps were also shared on the page to keep followers interested. When a Facebook user first opened the page, the header showed the main purpose of the page as to direct to the survey and pointed to a button that opened the Bristol Online Surveys page with the PIS (appendix M).

The page was “liked” by 42 people – most of whom were known to the researcher. However, some likes came from people around the world who had found the page by searching in Facebook. Facebook also provides “insights” for each page. However, these are of limited worth to a researcher as the details about their calculations is obscure. One useful insight provided by Facebook is the “reach” for each post; reach is the number of individuals who see that specific post. However, the page owner does not know who these people are, which country they reside or whether they read the item or just scrolled past it. The (unfunded) post with the most engagement was the information shared about the appearance on the CT podcast. The two posts (one advising people about the upcoming podcast and one linking to the podcast website after the recording) reached 162 people, generated 9 likes, one comment, one share and 6 people clicked the link to the podcast website.

*Figure B1: Screen shot of the studies Facebook page (captured 01/02/19)*



### Targeting Facebook Adverts

When designing Facebook adverts, organisations are able to choose very specific types of people who will see the advert. The examples of adverts shown in figure B2 are based on the researcher’s previous Facebook activity and interactions related to food blogs, books, galleries, design, as well as interactions with specific organisations (such as music venues and universities).

When registering on Facebook users are asked some basic demographic details including gender, date of birth and postcode/zip code of residence. No one under-13 is allowed to register a Facebook account. When creating an advert you can set the geographic area where you want the advert to show - a city and a kilometre radius or a specific state (figure B3). Facebook will only show the advert to users who registered their account with that post/zip code. You can also choose to show you advert to specific genders or age groups.

Facebook also provides many options of how to target your advert by interest of the users and uses algorithms to optimise delivery. These algorithms mark Facebook accounts as interested in topics if users do certain activities on Facebook associated with these topics. These activities include:

- Being a member of a Facebook group
- Clicking on links shown on Facebook
- "Sharing" specific stories or links
- "Following" or "liking" groups or pages related to a topic
- "Liking" content related to a topic.

Figure B2: Six examples of Facebook adverts (first four are desktop, final two are mobile)

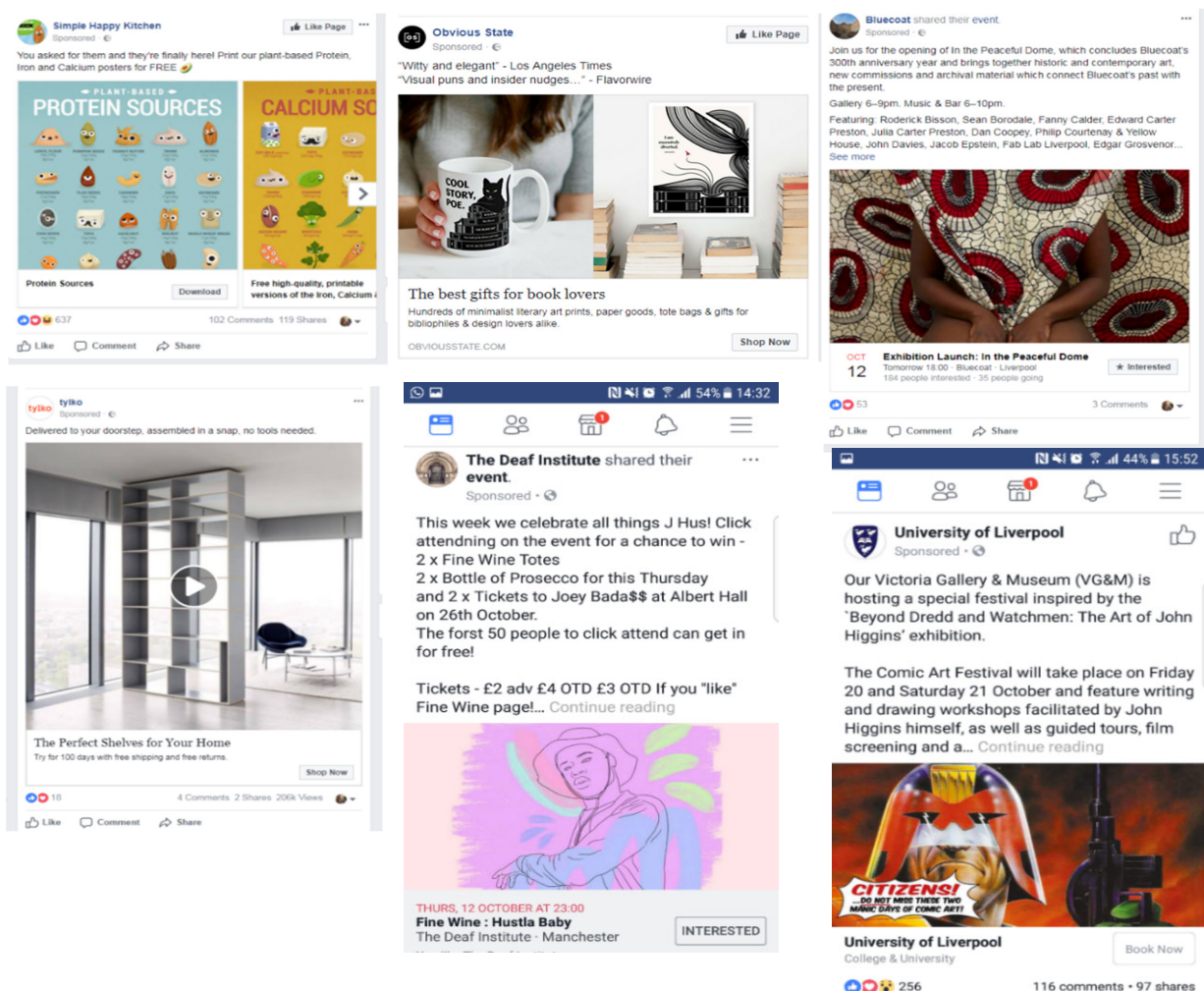
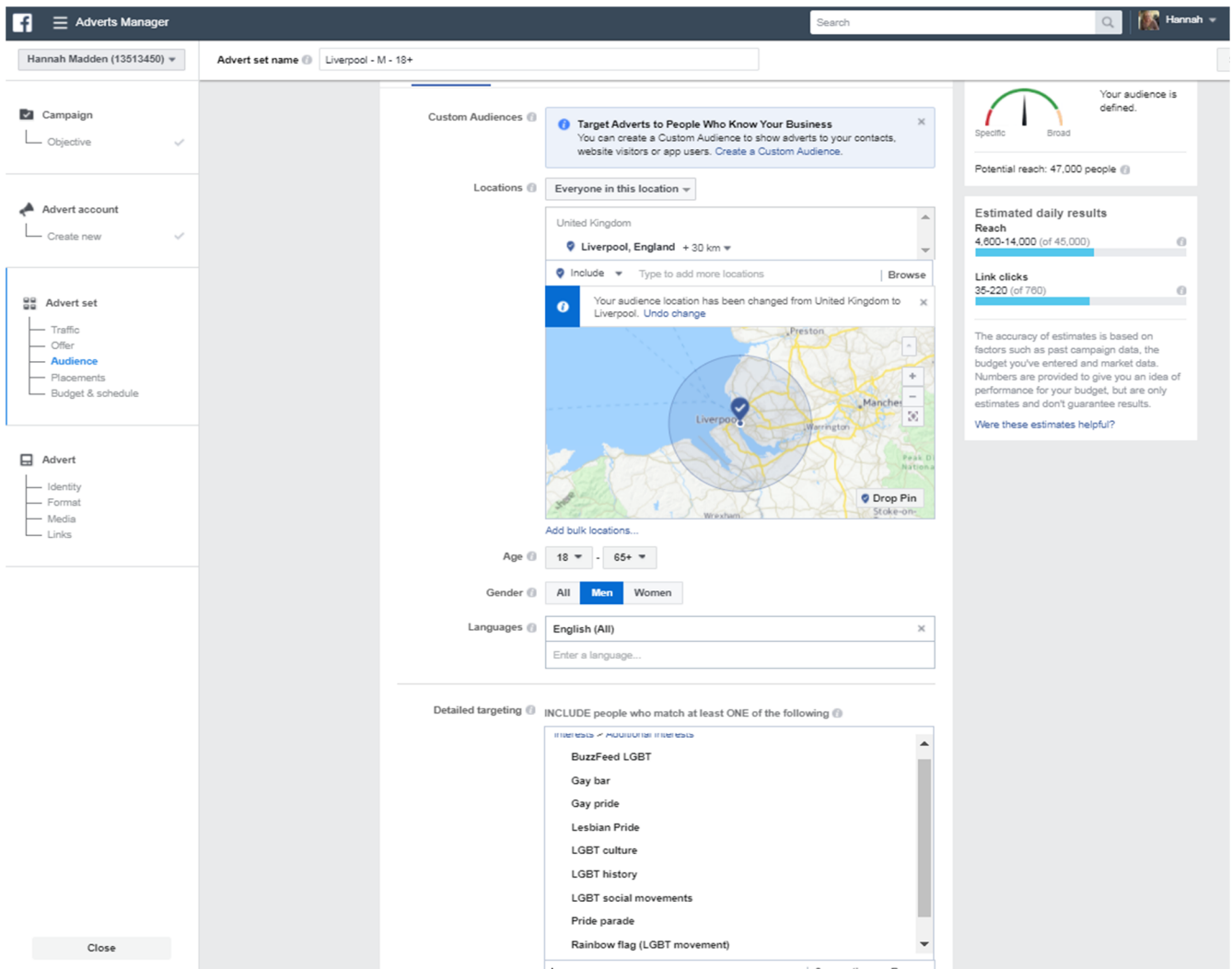


Figure B3 shows an example of the settings for this project aiming the advert at male users within 30km of Liverpool, aged 18 and over, who speak English and have matched on a variety of interests including *Buzzfeed LGBT* (a popular LGBT media source) *gay bar*, *gay pride*, *lesbian pride*, etc. The top right hand corner shows that there are potentially approximately 47,000 people who fit this criteria and may be shown the advert. This potential reach is an estimate and may be inflated by the marketing department at Facebook. The final list of 57 "interests" were used in the UK and USA targeted adverts is shown in box B1.

Figure B3: Facebook Adverts Manager showing how to target advertising.



**Box B1: Facebook targeted  
"interests"**

- |  |   |  |
|--|---|--|
| 1. Attitude (magazine)                                     | 20. Gender-specific and gender-neutral pronouns | 42. Lizzy the Lezzy  |
| 2. Bisexual community                                      | 21. Genderqueer                                 | 43. National Center for Lesbian Rights                           |
| 3. BuzzFeed LGBT   | 22. GLAAD                                       | 44. National Center for Transgender Equality                     |
| 4. Diva (magazine)   | 23. Grindr                                      | 45. National Coming Out Day                                      |
| 5. Gay bar   | 24. Homosexuality                               | 46. New York Lesbian, Gay, Bisexual, & Transgender Film Festival |
| 6. Gay Life  | 25. It Gets Better Project                      | 47. Out (magazine)   |
| 7. Gay Love  | 26. Lesbian Connection                          | 48. Pink (LGBT magazine)   |
| 8. Gay News  | 27. Lesbian Pride                               | 49. Pride  |
| 9. Gay pride   | 28. Lesbian Romance                             | 50. Pride parade   |
| 10. Gay rights   | 29. LGBT adoption                               | 51. Queer studies  |
| 11. Gay Rights Media                                       | 30. LGBT community                              | 52. Rainbow flag (LGBT movement)                                 |
| 12. Gay Star News  | 31. LGBT culture                                | 53. Same-sex marriage  |
| 13. Gay Times  | 32. LGBT Equality World Wide                    | 54. Same-sex marriage in the United States                       |
| 14. Gay Travel   | 33. LGBT history                                | 55. Same-sex relationship  |
| 15. Gay-friendly   | 34. LGBT History Month                          | 56. Scruff   |
| 16. Gay-Straight Alliances                                 | 35. LGBT in the United States                   | 57. The L Word   |
| 17. Gay, Lesbian, Bisexual, Transgender, Straight Alliance | 36. LGBT music                                  |  |
| 18. GAYSTAR  | 37. LGBT parenting                              |  |
| 19. Gender studies   | 38. LGBT rights in the United States            |  |
|  | 39. LGBT social movements                       |  |
|  | 40. LGBT tourism                                |  |
|  | 41. LGBTQ Nation                                |  |

### Boosting adverts

After a few trial runs using boosted adverts were tried to see if they were any more cost effective than ads generated in Ads Manager. Boosted ads work slightly differently and are launched from the Facebook page itself. With these you post to your page (or example a picture and text promoting recruitment) and at this point this post will only show up in the newsfeed of users who like the page. Then you are given the option to pay to “boost” the post. This launches a similar interface as Ads Manager where you can choose the same geographical areas, gender and detailed targeting as above (figure B3). This proved to be more cost effective and generate a higher number of clicks and survey completions for less money. The majority of ads were promoted using the Boost function. An example of a boosted post is shown in figure B4.

In both the standard ads and boosted ads Facebook allowed very little text in the picture. This made advertising particularly challenging as the logo included three words.

*Figure B4: Examples of approved boosted Facebook adverts (mobile and desktop)*



### Paying for adverts

Facebook charges per person who clicks on your advert, costs are lower if your advert directs to an internal Facebook page and more if the link takes people off Facebook to an external site. The exact price of adverts varies and depends upon demand and competition that day. Facebook has a variety of ways of setting prices and maximising revenue and previous research has shown it takes trial and error on the payment settings to find the most effective strategy for study recruitment (Ramo et al., 2014; Yuan et al., 2014). The advertiser sets a maximum daily budget for their advertising campaign. For example, a campaign over two weeks with a maximum budget of £210 would have a cap of £15 per day. Facebook will show the advert to eligible users until enough of them click the link to reach the maximum budget for the day. You only pay when someone clicks on the advert; if it is ignored you would not be charged.

### Maintaining confidentiality within Facebook advertising

Facebook does not tell the advertiser who will be shown the adverts and the advertiser is not able to see which users have seen it. The only information given to the advertiser is the total number being shown the advert (*reach/impressions*) and the number clicking on the advert (*engagements*). The advertiser also has no way of contacting users unless they follow the link and complete the survey, or interact with the study’s “page” (by “liking” the study’s “page” or messaging through the study “page”). The page owner cannot see a list of who “likes” their page, unless they are already Facebook friends with the likers.

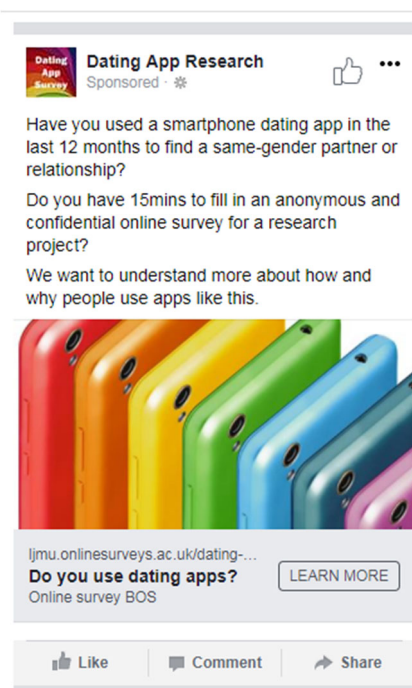


If a user decides to “like” or “follow” the study’s “page” this is like any of the many pages the user will follow. The general principle of Facebook is that if a user “likes” or comments on an item it is possible their friends will see this. This is a general community norm on Facebook and users make decisions about what to “like” or comment on every day. The study page had a statement the top reminding users if they click “like” or “follow” it may be visible to their other Facebook friends.

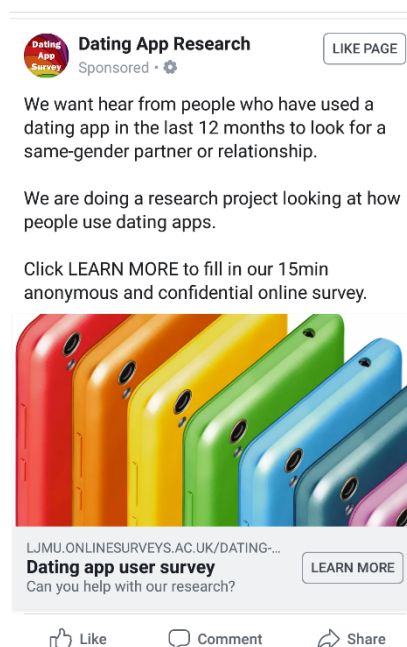
### Facebook advert approval

The first advert that was submitted was rejected by Facebook. It appears their algorithm judged the ad to be selling dating services. When the ad is not approved, you are given the option to appeal. The appeal message sent through the Facebook appeal service was never answered or acknowledged, despite sending further messages. After a week had passed with no response from Facebook another advert was submitted with slightly different wording – this was approved.

*Figure B5: First Facebook advert submitted and rejected (06/02/18)*



*Figure B6: Second, slightly amended, advert which was approved (13/02/18)*



In total 28 adverts (both Ads Manager and boosted ads) were submitted; 14 were approved and 12 were not approved. Three of the approved ads had problems (including a truncated link and the survey being shut). Therefore, eleven adverts yielded responses and cost effectiveness is calculated on these eleven adverts. Examples of the boosted posts that went live are included in figure B4.

In early May 2018 Facebook started “disapproving” the adverts. A further nine adverts were submitted in May and June 2018, until it was decided to abandon Facebook advertising. The notifications rejecting the adverts read:

*"Your advert wasn't approved because it doesn't follow our Advertising Policies by addressing the ages and/or relationship status of people on Facebook (e.g. "single and Lonely?", or "40 and single"). **How to fix:** We recommend focusing on your product or service, rather than the audience, with our advert".*

When adverts were not approved, the wording was changed and amended to try to ensure it did not relate to relationship status or reference sexual orientation. Examples of rejected ads are included in figure B7. An appeal was submitted each time an advert was rejected but no response was ever received from Facebook.

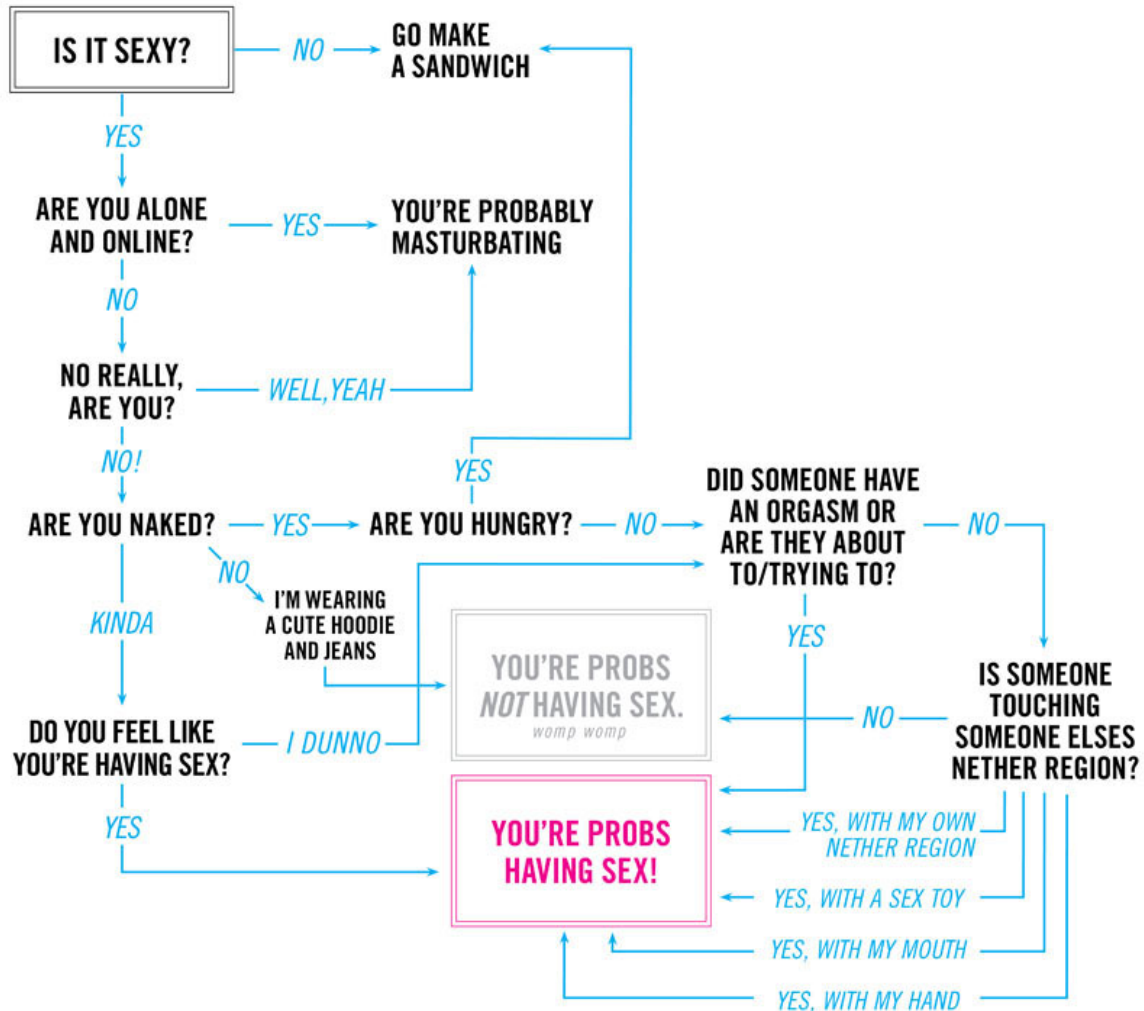
Eventually the adverts were being rejected instantly and it appeared that the Page may have been “blacklisted” or ads had been rejected so many times that Facebook was now automatically rejecting the ads.

*Figure B7: Examples of ads rejected by Facebook in May and June 2018*



## Appendix C: Defining sex between two women

### THE “IS IT SEX” FLOWCHART:



AUTOSTRADDLE.COM

Source: Autostraddle (2010)



## Appendix D: Additional recruitment info

Table D1: Study 1 information shared on Facebook groups and pages of community organisations

	Organisation/Group	Date posted/ shared	Where shared	Approx. likes of group/ page
Connecticut	Hartford Capital City Pride	07/06/2018	Request ignored	
	Modern Gay Connecticut	26/09/2018	Shared on page by admin	1,800
	APNH (New Haven)	26/09/2018	Shared on page by admin	1,200
	Lesbian Circuit in CT	04/11/2018	Shared on page by admin	3,000
	Hartford Lesbian & Gay Health Collective	17/12/2018	Shared on page by admin	8,400
	Queer Exchange New Haven	10/01/2019	Posted in group	575
	New Haven Pride Center	11/01/2019	Shared on page by admin	2,100
	Queer Exchange Connecticut	11/01/2019	Posted in group	110
	PRIDE New Haven	11/01/2019	Shared on page by admin	1,700
	Connecticut PRIDE	15/01/2019	Posted in group	1,100
	CT's Gay News	22/01/2019	Posted in group	440
Merseyside	Liverpool Pride	07/06/2018	Shared on page by admin	6,000
	Liverpool LGBT Choir	07/06/2018	Shared on page by admin	450
	Liverpool LGBT Women's Book Group	07/06/2018	Posted in group by admin	300
	Liverpool LGBT Network	11/06/2018	Shared on page by admin	1,000

Table D2: Other channels sharing the recruitment materials

Group/Organisation	Date posted/shared	Other info
Hartford Lesbian & Gay Health Collective (CT)	17/12/18	Shared on the HLGHC website
Sage Center, SCSU (CT)	27/10/19	Shared on the Sage Center website
Instagram	26/11/18 (CT) 14/01/19 (CT) 02/02/19 (CT) 08/02/19 (MS)	Shared on personal Instagram account

## Appendix E: Additional tables from Chapter 5 (survey analysis)

*Table E1: Post-hoc test differences between gender/area groups on numbers of times logging on to apps per day<sup>M</sup>*

	<b>Women CT (Mdn=2)</b>	<b>Men MS (Mdn=5)</b>	<b>Women MS (Mdn=3)</b>
<b>Men CT</b> (Mdn=4)	p=0.047	p=0.132	p=0.204
<b>Women CT</b> (Mdn=2)		p<0.001	p=0.334
<b>Men MS</b> (Mdn=5)			p<0.005

Table E1 shows men in MS logged onto apps significantly more times a day than women in CT ( $U=570$ ,  $p=0.001$ ) and more times than women in MS ( $U=1124.5$ ,  $p=0.001$ ). The differences between the other four groups were not significant ( $p>0.0083$ ).

*Table E2: Post-hoc test differences between gender/area groups on minutes spent on app per day<sup>M</sup>*

	<b>Women CT (Mdn=12.5)</b>	<b>Men MS (Mdn=30)</b>	<b>Women MS (Mdn=20)</b>
<b>Men CT</b> (Mdn=30)	p=0.018	p=0.646	p=0.061
<b>Women CT</b> (Mdn=12.5)		p<0.001	p=0.335
<b>Men MS</b> (Mdn=30)			p<0.001

Table E2 shows two significant differences in median minutes spent on apps per day between the four area/gender groups. Men in MS spent significantly longer on apps than women in CT ( $U=601.5$ ,  $p<0.001$ ) and than women in MS ( $U=1117.5$ ,  $p=0.001$ ).

*Table E3: Post-hoc test differences between gender/area groups on messages sent on app per day<sup>M</sup>*

	<b>Women CT (Mdn=1)</b>	<b>Men MS (Mdn=5)</b>	<b>Women MS (Mdn=2)</b>
<b>Men CT</b> (Mdn=8)	p<0.001	P=0.375	p<0.005
<b>Women CT</b> (Mdn=1)		p<0.001	p=0.2
<b>Men MS</b> (Mdn=5)			p<0.001

Table E3 shows four significant differences in median messages sent on apps per day between the four area/gender groups. Men in CT sent significantly fewer messages than men in MS ( $U=466$ ,  $p=0.000$ ) and than men in CT ( $U=180$ ,  $p=0.000$ ). In both areas, men sent more messages than the women in that area; CT men sent a median 8 messages (IQR=2-25) compared to CT women who sent 1 message (IQR=0-2.25,  $U=1124.5$ ,  $p=0.001$ ). In Merseyside men sent more than twice as many messages (Mdn=5, IQR=2-12) than MS women (Mdn=2, IQR=0-5,  $U=395$ ,  $p=0.002$ ).

<sup>M</sup> Mann-Whitney tests. To reduce the chance of a Type 1 error the Bonferroni correction was used, the critical value was  $p=0.0083$  (0.05 divided by the number of Mann-Whitney tests, 6)

*Table E4: Median number of sexual partners, partners met on apps and percent of sexual partners met on apps, by number of apps used.*

		<b>No. overall partners</b>	<b>No. app partners</b>	<b>Percent of sexual partners met on apps</b>
<b>3 apps or fewer ever used</b>	Mdn (IQR)	1 (0.75-3)	1 (0-2)	66.7% (20-100)
	n	106	101	75
<b>4 of more apps ever used</b>	Mdn (IQR)	4.5 (2-10)	3 (1-9)	81.2% (60-100)
	n	94	91	82
<b>P-value</b>		<b>&lt;0.001</b>	<b>&lt;0.001</b>	P=0.96

Table E4 shows the number of overall sexual partners, app partners and percent of partners met on apps by number of apps used. Those who have used four or more GSN apps had a significantly higher median number of overall sexual partners and sexual partners from apps, than those who had used 3 apps or fewer. This is likely to be linked to gender as women use fewer apps and report fewer partners.

## Appendix F: Interview consent form



### LIVERPOOL JOHN MOORES UNIVERSITY

#### **An exploration of smartphone dating app use by people seeking same-gender partners; a cross-cultural comparison of the UK and USA**

Liverpool John Moores University REC no. 18/PHI/030  
Southern Connecticut State University IRB no. 18-146

*Hannah Madden, PhD Candidate, Public Health Institute, Liverpool John Moores University (UK) & Public Health Department, Southern Connecticut State University (USA)*

1. I confirm that I have read and understand the information provided for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily ☐
2. I understand that my participation is voluntary and that I am free to withdraw at any time, without giving a reason and that this will not affect my legal rights. ☐
3. I understand that any personal information collected during the study will be anonymised and remain confidential ☐
4. I agree to take part in the above study ☐
5. I understand that the interview will be audio recorded and I am happy to proceed ☐
6. I understand that parts of our conversation may be used verbatim in future publications or presentations, but that such quotes will be anonymised. ☐

Name or initials of participant:

Date:

Signature:

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Name of Researcher:

Date:

Signature:

\_\_\_\_Hannah Madden\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

*Note: When completed, 1 copy for participant and 1 copy for researcher*

## Appendix G: Interview participant information sheet

### LIVERPOOL JOHN MOORES UNIVERSITY

### PARTICIPANT INFORMATION SHEET



**Title of Project:** An exploration of smartphone dating app use by men seeking same-gender partners; a cross-cultural comparison of the UK and USA.

**Hannah Madden – PhD Student.**

**Public Health Institute, Liverpool John Moores University, UK.**

You are being invited to take part in a research study. Please read the following information and take time to decide if you want to take part or not. If you have any questions, you can message Hannah via the Facebook page ([fb.me/datingappresearch](https://fb.me/datingappresearch)) or email her: [H.C.Madden@ljmu.ac.uk](mailto:H.C.Madden@ljmu.ac.uk).

#### 1. What is the purpose of the study?

This study is part of a PhD research degree. The aim of the study is to understand how people use smartphone dating apps (e.g. Tinder, Grindr, Jack'd, Her etc.) to find same-gender partners, relationships and friendships. The study is comparing the UK and the USA and is trying to understand how people view any benefits or risks of these apps. This stage of the research is face-to-face or Skype interviews with men who use apps.

We are inviting men in Merseyside (UK) and Connecticut (USA) who have used a smart-phone dating app in the last 18 months to find a sexual partner, friendship or relationship with someone of the same gender. If you live outside of these areas, you do not identify as male, you do not use dating apps or you only use apps to meet partners of the opposite gender, you are not eligible for this study.

#### 2. Why have I been invited to participate?

You have been invited to take part because you may fit the criteria for our study and have either taken part in an earlier phase of the research or you saw the advert on social media and asked for more information. To be included in this study participants need to: identify as male, have used a dating app in the last 18 months to find a same gender partner and live in either Merseyside (UK) or Connecticut (USA).

#### 3. Do I have to take part?

No. It is up to you to decide whether you want to take part. If you do want to take part, you will be asked to sign a consent form. You can stop the interview at any time, for any reason and we will not include your results in our findings. However, after we type up the interview you will have 28 days to withdraw – after this your comments will be combined with others so we will not be able to remove your comments. If there are any questions you do not want to answer, you can just skip them. If you do decide to stop the interview at any time, you will still get the Amazon gift card.

#### 4. What will happen to me if I take part?

If you decide to take part, you be interviewed by the researcher, Hannah. You can choose to do a face-face or Skype interview. The interview will be arranged for a time and place that suits you. The interview will take approximately one hour and will be audio-recorded. The interview questions ask about how you use apps, what you use them for and about some of your experiences if you have met people on the apps.

The second section of the interview will involve discussion of your apps. We can do this in one of two ways, it is up to you to choose:

- a) by discussing some pretend profiles we have made. I will ask you questions about how you might respond to these profiles, or
- b) by you showing me the apps you have on your phone and talking me through the dashboard/homepage. I will not ask to view your profile and I don't want to look at any messages you may have sent/received

We are interested in the positives and health benefits of these apps, not just the health risks, so all experiences would be very interesting. To say thank you for your time and reimburse you for any travel costs we will give you a £10 Amazon gift card.

**5. Will the interview be recorded and how will the recorded media be used?**

The interviews will be audio recorded on a password protected audio recording device. As soon as possible, the recording will be transferred to the secure university computer network and deleted from the Dictaphone. The recording will then be transcribed and the copy on the computer will also be deleted. We will not keep your name or identifying information linked to the recording or write up of the interview.

**6. What are the possible disadvantages and risks of taking part?**

Some of the questions are quite personal and ask about sexual behaviour which you may find uncomfortable. However, you do not have to answer any questions you do not like or do not have any experience of - just say to the interviewer to skip to the next question. There are links to organisations that can provide information and support below.

**7. What are the possible benefits of taking part?**

There aren't any direct benefits to you. However, the information we gather will be used to improve health promotion and may help services for people who have same-gender partners.

**8. What will happen to the data provided and how will my taking part in this project be kept confidential?**

The information you provide as part of the study is the **research study data**. Any research study data from which you can be identified (e.g. name or audio recording), is known as **personal data**. This may include more sensitive categories of personal data (**sensitive data**) such as your race/ethnic origin, health; sex life; or sexual orientation. Personal data does not include data that cannot be identified to an individual (e.g. data collected anonymously or where identifiers have been removed).

All information you give us in the interviews will be anonymous and confidential. The interview contains no questions that we could use to identify you and if you mention any things that make you identifiable (e.g. a college name or street) these will not be typed up.

We will use pseudonyms in transcripts and reports to help protect the identity of individuals and organisations unless you tell us that you would like to be attributed to any direct quotes.

After the interview you have the option to give us your email address for us to send you a copy of the findings of this research. This email address will not be linked with any of your answers and it will only be used for contacting you about this research. Only the lead researcher will have access to your email address. We will automatically delete your contact details once they are no longer required to administrate the research but we will delete them earlier if you ask us to.

**9. Limits to confidentiality**

The Investigator will keep confidential anything they learn or observe related to illegal activity unless related to the abuse of children or vulnerable adults, money laundering or acts of terrorism.

In certain exceptional circumstances where you or others may be at significant risk of harm, the investigator may need to report this to an appropriate authority. This would usually be discussed with you first. Examples of those exceptional circumstances when confidential information may have to be disclosed are:

- The investigator believes you are at serious risk of harm, either from yourself or others
- The investigator suspects a child may be at risk of harm
- You pose a serious risk of harm to, or threaten or abuse others
- As a statutory requirement e.g. reporting certain infectious diseases
- Under a court order requiring the University to divulge information
- We are passed information relating to an act of terrorism

#### **10. What will happen to the results of the research project?**

The investigator intends to publish the findings in a PhD thesis in 2020. The findings may also be written up in scientific journals or discussed at research conferences. All participants will be anonymous. If you want to receive a summary of the findings, you can give the researcher your email address at the end of the interview.

#### **11. Who is organising and funding the study?**

This study is organised and funded by the Faculty of Health, Education and Community at Liverpool John Moores University, UK.

#### **12. Who has reviewed this study?**

This study has been reviewed by, and received ethics approval from, the Liverpool John Moores University Research Ethics Committee (Reference number: 18/PHI/030) and received IRB approval from Southern Connecticut State University (IRB no: 18-146).

#### **13. What if something goes wrong?**

If you have a concern about any aspect of this study, please contact the relevant investigator who will do their best to answer your query. The researcher should acknowledge your concern within 10 working days and give you an indication of how they intend to deal with it. If you wish to make a complaint, please contact the chair of the Liverpool John Moores University Research Ethics Committee ([researchethics@ljmu.ac.uk](mailto:researchethics@ljmu.ac.uk)) and your communication will be re-directed to an independent person as appropriate.

#### **14. Data Protection Notice**

The data controller for this study will be Liverpool John Moores University (LJMU). The LJMU Data Protection Office provides oversight of LJMU activities involving the processing of personal data, and can be contacted at [secretariat@ljmu.ac.uk](mailto:secretariat@ljmu.ac.uk). This means that we are responsible for looking after your information and using it properly. LJMU's Data Protection Officer can also be contacted at [secretariat@ljmu.ac.uk](mailto:secretariat@ljmu.ac.uk). The University will process your personal data for the purpose of research. Research is a task that we perform in the public interest.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will keep the information about you that we have already obtained. You can find out more about how we use your information by contacting [secretariat@ljmu.ac.uk](mailto:secretariat@ljmu.ac.uk).

If you are concerned about how your personal data is being processed, please contact LJMU in the first instance at [secretariat@ljmu.ac.uk](mailto:secretariat@ljmu.ac.uk). If you remain unsatisfied, you may wish to contact the Information Commissioner's Office (ICO). Contact details, and details of data subject rights, are available on the ICO website at: <https://ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/individuals-rights/>



**Contact Details of Researcher:**

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Dr Jean Breny, Professor and Chair  
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T: (+1) 203-392-7008. e: [brenyj1@southernct.edu](mailto:brenyj1@southernct.edu)

**Further support and information:**

If you want any more information or support for your physical, sexual or mental health you can contact these organisations:

**UK:**

NHS Choices - LGBT health webpage [www.nhs.uk/livewell/lgbhealth/Pages/Gayandlesbianhealth.aspx](http://www.nhs.uk/livewell/lgbhealth/Pages/Gayandlesbianhealth.aspx)  
Armistead Project (Liverpool) [www.merseycare.nhs.uk/our-services/physical-health-services/armistead/](http://www.merseycare.nhs.uk/our-services/physical-health-services/armistead/)

**USA:**

Center for Disease Control and Prevention - LGBT health webpage: [www.cdc.gov/lgbthealth/index.htm](http://www.cdc.gov/lgbthealth/index.htm)  
Fenway Health: [fenwayhealth.org/](http://fenwayhealth.org/)

## Appendix H: Interview discussion guide

### **An exploration of smartphone dating app use by people seeking same-gender partners; a cross-cultural comparison of the UK and USA**

Hannah Madden, PhD Researcher, Public Health Institute, Liverpool John Moores University, UK

*First of all, thank you for agreeing to meet with me; I really appreciate the time you have given.*

*I am interested in how and why people use apps and how app use influences health. I am thinking about health in a really general way – so health includes positive things like happiness, having fun and community connections as well as negative things like sexually transmitted infections, mental distress, violence etc.*

*When I am talking about dating-apps I mean apps like Grindr, Scruff etc. Those apps that use your phone's GPS to find other men nearby. Some people use these apps to find casual sex, some want friends and some want serious relationships – or a mix of all three!*

*Remember if there are any questions you cannot or don't want to answer just say "skip" and we can skip onto the next one. I will not come back to this topic or ask any questions about why you skipped. If you would like to stop the interview at any point, this is okay, you are free to withdraw at any time. You will still get the Amazon voucher if you stop the interview.*

*Everything that you say in the interview will be anonymised, and we will not use any of your names or anything that could identify you personally. The only time we would break confidentiality is when you tell us you have, or intend to harm yourself or another person, where children may be at direct risk or if you tell us a terrorist act may be committed.*

*If it is okay, I would like to tape record the conversation so I can give you my full attention. These recordings will only be heard by myself and will be deleted after they have been written up. The recordings will be stored digitally on a secure computer. After this I will delete the original recording from this Dictaphone.*

*After the interview, I will type up our conversation, this will also be saved on a secure university computer, and no-one but the research team will have access to it. I may use the occasional quote from our conversation in the report but your name will not appear next to it.*

*If you are all happy to proceed please could I ask you to read and sign a consent form (face-to-face) verbally consent (Skype).*

<b>Main question:</b>	<b>Possible prompts</b>
Can you just tell me a bit about yourself and where you're from	How old are you? Where do you live (just city/town/county) How would you describe your ethnicity/race? Is this a rural or urban area? Have you always lived in Connecticut/Merseyside
How "out" would you say you are?	Do most, or all, of your family know about your sexual orientation? What about friends? Work colleagues? What is the reason for being out/people not knowing?
Talk me through how long you've been using apps	Why did you start using dating apps to meet same gender partners? When did you start? Have you used them constantly all this time? Did you take any breaks?
Which apps do you use?	Which apps do you use now? How many do you have on your phone now? Are there others you have used in the past? If you have used other apps, why did you stop/change? Do you use any apps to meet people of the opposite gender? Do you use the same apps as your peers?
Can you talk me through what you tend to be looking for on apps?	Are you currently in a relationship? Is this "monogamous"? Is it more casual, hook ups or sex? Are you looking for a serious relationship? Do you use different apps for different purposes? How? Why? Do you use apps to find women too? Do you think this is what most people tend to be looking for?
Why do you use apps as opposed to other ways of meeting people?	Are they better than bars/social spaces? Has this changed over time? Do you think this is the same for other people/peers?
Can you talk me through some of the positives of using apps?	What do you get out of it? Does it have any benefits or positive impacts on your health? Mental health? Happiness? Love? Sexual pleasure? Community or reduces isolation?
Are there any negatives about using apps or any things that worry you about using them?	Have you had any negative experiences? Do you think or worry about any risk of using the apps? Are there any health consequences you worry about? Sexual health, safety, mental health etc?
If you wanted to change the way you use apps or the kind of partners you met – do you think this would be easy or hard?	Do you think you have the control over how things turn out when you do meet/chat to someone?? How much power/freedom do you think you have to change these positives? How much power/freedom do you think you have to change these positives?

Health services and support	Do you access any health services regularly? LGBT health services or sexual health services? Have you ever been tested for STD/STIs or HIV? How often do you get tested or what prompts you to get tested?
<b>Two options now for you to decide how we proceed:</b>  <i>Options 1 is to open the apps on your phone and talk me through them. I'll then ask a few questions about your dashboard and the things that pop up.</i>  <i>I do not want to look at your chats and you do not have to show me anything you don't want. Just going to use it as a prompt for the next section.</i>  <i>Option 2 – if you don't want to show me your apps I've got some print outs of pretend, mock-up profiles. We'll have a look at these and I will use them to kind of prompt the discussion</i>  <i>Which would you prefer?</i>	
<b>Option 1: Talking through apps on phone</b>	
So looking at this grid of nearby men – do you recognise any?	Have you talked to many of these people? Have you met any of them in person? What happened when you met them?
Any of these pictures look like someone you'd be interested in or contact?	Do you tend to open conversations? Can you give me an example of the kind of things you say to open the conversation? How direct are you about what you want?
Would you avoid any of these men?	Any warning signs or red flags that put you off? Mental health? Safety? Sexual health?
Do you have any methods or strategies you use on apps?	Are there any rules you have for yourself? Or systems you have in place to reduce any risk? What about ways to get the best out of it?
Sexual health	Do you normally have any discussions about safer sex before you meet someone? Do you see many profiles that mention bare backing? How do you feel about this? Do you see many profiles that mention PrEP? Is this important? Do you remember seeing any adverts on the apps for safe sex/condoms/PrEP etc? Do you think apps are a good place to advertise?
<b>Option 2 – talking through mock-ups</b>	
So looking at these mock ups what is your first impression of the guys?	Are any of these of people you might be interested in or contact? Do you tend to open conversations? Can you give me an example of the kind of things you say to open the conversation? How direct are you about what you want? What might your intentions be when you see these?
Would you avoid any of these men?	Any warning signs or red flags that put you off?
Do you have any methods or strategies you use on apps?	What might your intentions be when you see these? Are there any rules you have for yourself? Or systems you have in place to reduce any risk? What about ways to get the best out of it?

Sexual health	<p>Do you normally have any discussions about safer sex before you meet someone?</p> <p>Do you see many profiles that mention bare backing? How do you feel about this?</p> <p>Do you see many profiles that mention PrEP or HIV status? Is this important to you?</p> <p>Do you remember seeing any adverts on the apps for safe sex/condoms/PrEP etc? Do you think apps are a good place to advertise?</p>
<p>Thank you for talking me through this information.</p> <p>Is there anything else you want to tell me about your experience of using apps? Anything else I haven't asked but you think is important?</p> <p>If I use quotes in the write up I would like to use a <b>fake name</b> so you stay anonymous. Do you want to choose a name you would like to be known as?</p> <p>Do you want me to send you information about the findings of this research? If so, can I take your <b>email</b> address? This will only be used to send you the summary of our findings. The address will not be linked with anything you have said today and we will not share this with anyone else. After the study is completed, we will delete your email address.</p>	

*Thank you and voucher handover*

## Appendix I: Thematic analysis coding table

Key themes	Sub-themes	NVivo codes
1. Patterns of app use	Reasons for using apps	Dating or casual relationship Kill time, bored, game Looking for casual sex or horny Looking for relationships on apps Misc. reasons for using apps Networking, community and friends Travelling, away from home, new place
	Differences between apps	Grindr Her Other apps Tinder
	Meeting on apps compared to meeting other ways	Compared to meeting other ways Comparing to straight people
2. Influences on GSN app use behaviour	Friends & social norms	Social norms and friends Comparing use to friends Don't have friends to ask Friends experiences Friends keep them safe Friends suggested apps
	Technology & design of the apps	Text and info on profiles App norms & rules Design & audience of apps Numbers on apps & crossover
	Mental wellbeing	Resilience Hope When started apps Post-breakup app use
	Resilience & their relationship with apps	Healthy Relationship with app Addictive unhealthy relationship with apps
	Family & religion	School & college Small city compared to big cities Religion Family
	Drugs & alcohol	Chemsex Alcohol Cannabis Other drugs
3. Positives and benefits of using GSN apps	Non-sexual social connections	Travelling & away from home & new place Networking community & friends Isolation loneliness Friendships gaining Kill time or bored game
	Access to romantic & sexual partners	Distance, nearby, & people close Know people defo gay Looking for relationships on apps New people increases the pool Numbers on apps, crossover & critical mass - latent Quick easy take less effort Emotionally less risky to use apps Casual turned into serious Found love on apps
	Apps boost self esteem	Ego boost Emotionally less risky to use apps
	Sex & pleasure	Sexing & online sex Hooking up Sex as positive outcome or aim Group sex

<b>4. Negative impacts and risks of GSN apps</b>	Self-esteem, rejection and body image	Body image & body shaming Ego bashed - self esteem Rejection & ghosting
	Racism, discrimination & offensive behaviour	Catfishing Race & Racism Dick pics Rejection & ghosting Other people closeted or discreet Snapchat filters High risk sex, fetishes, weird requests Internalised homophobia, no camp & straight acting Crazy & intense people Being polite, bad manners & inconsiderate
	Oversexualised focus of apps	Apps encourage promiscuity Old fashioned lost art of seduction Demanding negative statements on apps - latent Apps make you shallow judgemental & dehumanising - latent Oversexualised content on apps
	"Magic unicorn hunters"	Threesomes or requests from couples
<b>5. Strategies for staying happy and healthy</b>	Managing interactions on apps	Age Opening conversations Rule when using apps Faceless profiles Honesty on apps - latent
	Safety when meeting people from GSN apps	How quickly they meet app partners Need emotional connection for sex When they sleep with app partner - latent Rules for meeting IRL Meeting public place Personal safety Sensing and trusting gut
	Uninstalling or stopping using apps	Erasing & deleting apps
	Meeting men vs meeting women	Meeting & dating men vs women
<b>6. Sexual health</b>	Safer sex	Bareback Dental dams High risk sex, fetishes, weird requests Lesbian sex not risky - latent Safer sex - men with men Safer sex - women with men Safer sex - women with women STIs
	HIV & PrEP	PrEP HIV
	Sexual health services and screening	Sexual health services & screening
	Health promotion on apps	Health promotion on apps



## Appendix J: Outness Inventory (Mohr and Fassinger, 2000)

December 11, 2011

Dear Researcher,

Thank you for your interest in the Outness Inventory. The scale was published in a scientific journal for use in the public domain. You do not need to contact any of the authors for permission to use this scale in noncommercial research. You may *not* use the scale for commercial purposes without permission. The following pages contain the scale itself, as well as basic information about the scale. If you have questions or concerns about the scale that are not addressed in these pages, then feel free to contact me using the contact information below. Best wishes with your research!

Sincerely,  
Jonathan Mohr

Assistant Professor Counseling Psychology Program Department of Psychology 2145K Biology-Psychology Building University of Maryland College Park, MD 20742-4411 E-mail: [jmohr@umd.edu](mailto:jmohr@umd.edu)  
Office phone: 301-405-5907 Office fax: 301-314-5966

### INFORMATION SHEET: *OUTNESS INVENTORY*

#### What is the Outness Inventory?

The Outness Inventory (OI) is an 11-item scale designed to assess the degree to which lesbian, gay, and bisexual (LGB) individuals are open about their sexual orientation. Responses on OI items indicate the degree to which the respondent's sexual orientation is known by and openly discussed with various types of individuals (e.g., mother, work peers).

#### How can OI data be used?

Our analyses suggested that individuals can use the OI in three different ways. First, data from individual items can be used if the researcher is interested in outness to specific figures or types of figures (e.g., mother, work peers). Second, factor analyses indicated that the OI can be used to provide information about levels of outness in three different life domains: family, everyday life, and religion. Finally, analyses suggested that the OI can also be used to provide an index of overall outness.

#### How is the OI scored?

*Out to Family* = average of items 1, 2, 3, and 4

*Out to World* = average of items 5, 6, 7, and 10

*Out to Religion* = average of items 8 and 9

*Overall Outness* = average of the above three subscales

#### Why is Overall Outness scored by averaging subscales rather than items?

The factor analyses used to develop the scale suggested that outness has a hierarchical factor structure, where overall outness is represented by lower level domains of outness (e.g., outness to family, outness in one's religious institution). Thus, from a conceptual and measurement perspective, it makes the most sense to average the subscales rather than the individual items. There is also a practical reason to score Overall Outness in this manner. If Overall Outness were calculated by averaging together individual items, then one would end up with a score that gives less weight to domains associated with fewer items (in this case, Outness to Religion).

**Why don't the subscales include item 11 (old heterosexual friends)?**

In the exploratory factor analysis used to develop the scale, this item had strong loadings on both Out to Family and Out to World. This finding likely reflects the reality that relationships with old heterosexual friends are like family relationships in some ways, and like everyday friendships in other ways. Because this item did not cleanly load on a single subscale, we did not include it in subscales. However, researchers are free to use respondent ratings on this item in whatever way suits their purposes. In particular, if you are using only a single subscale in your research (e.g., Out to World), then you might consider adding in the item. Similarly, if you are using the measure of overall outness, then it may make sense to include the item.

**How are participants supposed to respond to items that represent classes of people (e.g., siblings, work peers)?**

Instructions ask respondents to indicate how “generally out” they are to the class of people. Such items do not allow participants to indicate their outness levels to specific people. Thus, in its published form, the measure does not allow researchers to differentiate a participant’s outness levels to different siblings. If you wish to make such distinctions in your research, then, as indicated below, we encourage you to consider adding items to the measure. For example, a researcher might consider allowing respondents to indicate outness levels to each of her siblings.

**What should be done if participants do not respond to all items?**

It is not unusual for participants to leave an item blank because the item is not applicable. For example, some individuals will not be able to provide a rating for “father” because their father died by the time they were aware of their sexual orientation. Similarly, nonreligious individuals will not be able to provide meaningful responses for the religion items. Such situations can be dealt with by simply taking the average of all available information. For example, if a respondent has no response for “father” but has responses for all other Out to Family items, then you can calculate an Out to Family score for this person by averaging the three other relevant items. To calculate person’s score for Overall Outness, you can simply calculate the average of all items for which ratings are available. Finally, it is worth noting that unanswered OI items could be handled with advanced methods developed for dealing with missing data, such as multiple imputation and full information maximum likelihood approaches (see Schafer & Graham, 2002 in *Psychological Methods*).

**Can I add items?**

Adding items (or even removing items) may be advisable depending on the population you are surveying. For example, if you know that your population includes many individuals from blended families, then you may want to include stepparent items. Decisions about which subscale such items should go in can be made using common sense (e.g., “stepmother” should probably go into Out to Family) or statistical analyses (e.g., factor analyses, examination of item-total correlations).

**Can I change the rating scale?**

The rating scale is, in part, what makes the OI a unique and sensitive measure of outness. We discourage users from making any substantive changes to the rating scale. With that said, we have received feedback suggesting that it might be worth changing the “RARELY” on rating point 5 to “NEVER or RARELY.”

**What are the psychometric properties of the OI?**

Data from a large sample of partnered LGB adults provided good initial support for the reliability and validity of the OI. Exploratory and confirmatory factor analyses (conducted separately for women and men) were used to derive the subscales. Before using the OI, we suggest that you read about the instrument development process in the following article:

Mohr, J. J., & Fassinger, R. E. (2000). Measuring dimensions of lesbian and gay male experience. *Measurement and Evaluation in Counseling and Development*, 33, 66-90.

## OUTNESS INVENTORY

Use the following rating scale to indicate how open you are about your sexual orientation to the people listed below. Try to respond to all of the items, but leave items blank if they do not apply to you. If an item refers to a group of people (e.g., work peers), then indicate how out you generally are to that group.

- 1 = person definitely does NOT know about your sexual orientation status  
 2 = person might know about your sexual orientation status, but it is NEVER talked about  
 3 = person probably knows about your sexual orientation status, but it is NEVER talked about  
 4 = person probably knows about your sexual orientation status, but it is RARELY talked about  
 5 = person definitely knows about your sexual orientation status, but it is RARELY talked about  
 6 = person definitely knows about your sexual orientation status, and it is SOMETIMES talked about  
 7 = person definitely knows about your sexual orientation status, and it is OPENLY talked about  
 0 = not applicable to your situation; there is no such person or group of people in your life

1. mother	1	2	3	4	5	6	7	0
2. father	1	2	3	4	5	6	7	0
3. siblings (sisters, brothers)	1	2	3	4	5	6	7	0
4. extended family/relatives	1	2	3	4	5	6	7	0
5. my <u>new</u> straight friends	1	2	3	4	5	6	7	0
6. my work peers	1	2	3	4	5	6	7	0
7. my work supervisor(s)	1	2	3	4	5	6	7	0
8. members of my religious community (e.g., church, temple)	1	2	3	4	5	6	7	0
9. leaders of my religious community (e.g., church, temple)	1	2	3	4	5	6	7	0
10. strangers, new acquaintances	1	2	3	4	5	6	7	0
11. my <u>old</u> heterosexual friends	1	2	3	4	5	6	7	0

## Appendix K: Literature review search criteria

Search terms were grouped into three categories; "GSN apps", "health outcomes" and "LGBT population" and combined using AND and OR. Searches were updated in July 2020.

**Title/Abstract:** Bisexual\* OR gay OR Homosexual OR Lesbian\* OR LGB\* OR "men who have sex with men" OR MSM OR pansexual\* OR queer OR "sexual minorit\*" OR "sexual orientation" OR sexuality OR transgender\* OR Transsex\*

**AND**

**Title/Abstract:** "cell phone" OR "Cellular phone" OR "Dating app" OR Geosocial OR "Geo-social" OR "Geospatial networking" OR Grindr OR GSN OR Hornet OR Jack'd OR Manhunt OR "mobile phone" OR Scruff OR Smartphone\* OR "Social networking" OR Tinder

**AND**

**Title/Abstract:** AIDS OR "Acquired immune deficiency syndrome" OR Alcohol OR "Anal sex" OR assault OR "Binge drinking" OR Chlamydia OR community OR Condom OR "dental dam" OR depression OR drinking OR "drug abuse" OR "Drug use" OR friend\* OR Gonorrhoea OR health OR Herpes\* OR heteronormat\* OR HIV OR "Human papillomavirus" OR HPV OR illness OR ill-health OR isolation OR love OR "mental health" OR "oral sex" OR orgasm OR pleasure OR rape OR rejection OR relationship OR resilience OR risk OR romance OR esteem OR "Sexual abuse" OR "Sexual behav\*" OR "Sexual intercourse" OR "Sexual risk" OR shame OR "social norm" OR stigma OR stress OR Syphilis OR "Unsafe sex\*" OR VD OR "Venereal disease" OR violence OR wellbeing

## Appendix L: Papers examining GSN apps and health in LGB populations, included in literature review

Author and year	Type of study	No. participants/ studies included in sys reviews	Population group	Country	Which GSN apps included/discussed/ recruited from
Albury, et al. (2016)	Qualitative	Unclear	Young WSW & MSM	Australia - New South Wales	Any
Blackwell, et al (2015)	Qualitative	36	MSM	USA & Puerto Rico	Grindr
Bonner-Thompson (2017)	Qualitative	33	MSM	UK - Newcastle	Grindr
Brubaker, et al. (2016)	Qualitative	16	MSM	USA	Grindr
Chan, et al. (2016)	Qualitative	70	MSM	USA - Rhode Island	GSN apps and sociosexual websites
Davis, et al. (2016)	Qualitative	24	MSM	UK - Lanarkshire, Scotland	Any
Ferris and Duguay (2020)	Qualitative	27 (Australia n=8, Canada n=2, UK n=17)	WSW	Australia, Canada & UK	Tinder
Filice, et al. (2019)	Qualitative	13	MSM	Canada - Toronto	Grindr
Jaspal (2017)	Qualitative	18	MSM	UK - London & Midlands	Grindr
Lauckner, et al. (2019)	Qualitative	20	MSM	USA - rural areas	Any
Licoppe and Morel (2016)	Qualitative	23	MSM	France	Grindr
Mackee (2016)	Qualitative	400 online interactions. 80 interviews (41 were first dates from apps)	MSM	UK - London	Tinder
Miles (2017)	Qualitative	36	MSM	UK - London	Any - but Grindr dominated the interviews
Numer, et al. (2019)	Qualitative	16	MSM	Canada - Nova Scotia	Grindr
Phillips (2015)	Qualitative	Unclear - ethnography	MSM	n/a	Grindr

Pond and Farvid (2017)	Qualitative	8	Bisexual women	New Zealand	Tinder
Ryan (2016)	Qualitative	18	Males sex workers	Dublin - -all South American sex workers	Any
Schipani-McLaughlin (2017)	Qualitative	20	MSM	USA - Rural areas	Any
Shield (2018)	Qualitative	12	MSM	Denmark & Sweden	Grindr
Smiley, et al. (2020)	Qualitative	23	Young black MSM	USA - Washington DC	Jack'd
White Hughto, et al. (2017)	Qualitative	29	MSM	USA - Hartford & New Haven, Connecticut	Social media, inc. GSN apps
Yeo and Fung (2016)	Qualitative	74	Young MSM	China - Hong Kong	Grindr & Jack'd
Allen, et al . (2017)	Quantitative	studies	MSM	USA - Chicago, Illinois, Kansas City, Missouri, & Fort Lauderdale, Florida	Any
Badal, et al. (2018)	Quantitative	3105	MSM	USA & Puerto Rico	GSN apps and sociosexual websites
Beymer, et al. (2014)	Quantitative	7184	MSM	USA - Los Angeles	Any
Beymer, et al. (2016)	Quantitative	148	MSM	USA	Any
Bien, et al. (2015)	Quantitative	1342	MSM	China	Any
Blomquist et al (2020)	Quantitative	3933	MSM	UK - England	Any
Boonchutima (2017)	Quantitative	350	MSM	Thailand	Any
Burrell, et al. (2012)	Quantitative	105	MSM	USA - Los Angeles	Grindr
Chan (2016)	Quantitative	408	MSM	USA & China (inc. Hong Kong & Taiwan)	Jack'd
Chan (2017)	Quantitative	401	MSM	USA & Canada	Grindr, Jack'd, or SCRUFF.
Chan, et al. (2018)	Quantitative	415	MSM	USA - Rhode Island	Any
Chan, et al. (2018)	Quantitative	1672	MSM	Australia - Melbourne	Any
Chu, et al. (2019)	Quantitative	2744 Grindr profiles	MSM	USA - 50 biggest metro areas	Grindr
Corriero and Tong (2015)	Quantitative	Study 1 = 62 Study 2 = 326	MSM	USA	Grindr
Dangerfield, et al. (2020)	Quantitative	580	MSM	France - Paris	Unclear which app they recruited through
Devost, et al. (2018)	Quantitative	9499	MSM	USA - Los Angeles	Social media, inc. GSN apps

Duncan, et al. (2018)	Quantitative	175	MSM	USA - New York City	Grindr
Duncan, et al. (2018)	Quantitative	75	Young black MSM	USA - Gulfport, Mississippi; Jackson, Mississippi; & New Orleans, Louisiana	Any
Fitzpatrick, et al. (2015)	Quantitative	25,365 Grindr profiles	MSM	USA & Canada (6 cities & 6 college towns)	Grindr
Gibbs and Rice (2016)	Quantitative	195	MSM	USA - West Hollywood, California	Grindr
Goedel, et al. (2016a)	Quantitative	152	MSM	USA - New York City	Unclear which app they recruited through
Goedel, et al. (2016b)	Quantitative	84	MSM	USA -Atlanta, Georgia	Unclear which app they recruited through
Goedel, et al. (2017a)	Quantitative	179	MSM	UK - London	Unclear which app they recruited through
Goedel, et al. (2017b)	Quantitative	92	MSM	USA -Atlanta, Georgia	Grindr
Goedel, et al. (2017c)	Quantitative	92	MSM	USA -Atlanta, Georgia	Unclear which app they recruited through
Goedel, et al. (2019)	Quantitative	179	MSM	UK - London	Unclear which app they recruited through
Goedel and Duncan (2015)	Quantitative	92	MSM	USA -Atlanta, Georgia	Grindr
Goedel and Duncan (2016)	Quantitative	174	MSM	USA - New York City	Grindr
Griffiths, et al. (2018)	Quantitative	2733	MSM	Australia & New Zealand	Unclear which app they recruited through
Groskopf, et al. (2014)	Quantitative	126	MSM	USA - New York City	Any
Hahn, et al. (2018)	Quantitative	64	Study 1 - MSM Study 2 - young people of all genders	USA	Any
Holloway, et al. (2014)	Quantitative	195	Young MSM	USA - Southern California	Grindr
Holloway, et al. (2015)	Quantitative	295	MSM	USA - California	Unclear which app they recruited through
Hong, et al. (2019)	Quantitative	403	MSM	China - Ningbo	any
Hull, et al. (2016)	Quantitative	36428	MSM	Australia - large cities	Any



Landovitz, et al. (2013)	Quantitative	375	MSM	USA - Los Angeles	Grindr
Lee, et al. (2012)	Quantitative	299	MSM	China - Hong Kong	Any
Lehmiller and Iorger (2014)	Quantitative	110	MSM	USA	Any
Lorimer, et al. (2016)	Quantitative	702	MSM	UK - Scotland, Wales, Northern Ireland & Republic of Ireland	Social media, inc. GSN apps
Luo, et al. (2019)	Quantitative	9280	MSM	China - Beijing	Blued
Macapagal, et al. (2016)	Quantitative	323	MSM	USA	Unclear which app they recruited through
Macapagal, et al. (2018)	Quantitative	200	Young MSM	USA	Any
Macapagal, et al. (2019)	Quantitative	219	Young MSM	USA	Any
O'Connor, et al. (2018)	Quantitative	1158	MSM	Ireland	Any
Phillips, et al. (2015)	Quantitative	1997	MSM	USA	Unclear which app they recruited through
Phillips, et al. (2014)	Quantitative	379	MSM	USA - Washington DC	Any
Queiroz, et al. (2019)	Quantitative	412	Older MSM	Brazil	Grindr, Hornet, Scruff, DaddyHunter
Quieroz, et al. (2019)	Quantitative	2250	MSM	Brazil	Grindr, Scruff, Hornet, Tinder
Rendina, et al. (2014)	Quantitative	1351	MSM	USA - New York City	Grindr
Rhoton, et al. (2016)	Quantitative	449	MSM	India - Maharashtra region	GSN apps and sociosexual websites
Rice, et al. (2012)	Quantitative	195	MSM	USA - Los Angeles	Grindr
Rogge, et al. (2020)	Quantitative	3180	General sample	USA	Any
Salamanca, et al. (2019)	Quantitative	372	Young MSM	USA - Chicago	Any
Sun, et al. (2018)	Quantitative	457	MSM and trans women	USA - North Carolina	Any
Tang, et al. (2016)	Quantitative	1424	MSM	China	Unclear, recruited through websites
Thai (2019)	Quantitative	1039	MSM	Australia	Grindr

Van De Wiele and Tong (2014)	Quantitative	63	MSM	USA (mainly, didn't exclude international respondents)	Grindr
Watchirs Smith, et al. (2018)	Quantitative	20091	General sample	Australia	All GSN apps and internet grouped together
Wei, et al. (2019)	Quantitative	4935	MSM	China - Shenzhen	Any
Wei, et al. (2019)	Quantitative	4935	MSM	China - Shenzhen	Any
Whitfield, et al. (2017)	Quantitative	546	MSM	USA - Denver	Any
Wintrobe, et al. (2014)	Quantitative	146	Young MSM	USA - Long Beach & West Hollywood, California	Grindr
Yeo and Ng (2016)	Quantitative	213	Young MSM	China - Hong Kong	Grindr and Jack'd
Miller (2015)	Analysis of open text boxes in a survey	143	MSM	USA & Canada	Any
Wang, et al. (2018)	Systematic review & meta analysis	25 studies	MSM	Global	Any
Zou and Fan (2016)	Systematic review & meta analysis	17 articles from 14 studies	MSM	Global	Any
Choi, et al. (2017)	Systematic review	13 articles from 11 studies	Search criteria was "LGBT", but only identified studies with MSM	Global	Any
Quieroz, et al. (2017)	Literature review	14 studies	MSM	Global	Any
Holloway, et al. (2014)	Literature review	37 studies	Young people & "populations most at risk"	All studies discussed are from the USA	Social media, inc. GSN apps
Cserni (2019)	Discussion/Commentary	N/A	MSM	Discussed studies from the USA, UK & Brazil	
Race (2015)	Discussion/Commentary	N/A	MSM	Unclear	Any
Roth (2016)	Discussion/Commentary	N/A	MSM	Discussed from USA perspective	Any
Tziallas (2015)	Discussion/Commentary	N/A	<u>MSM</u>	Unclear	Scruff and Grindr
Woo (2015)	Discussion/Commentary	N/A	MSM	Global	Grindr
Thomas et al. (2016)	Epidemiology report	N/A	MSM	UK - Wales	Any



## Dating App Research

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### Information for participants

**Title of Project:** An exploration of smartphone dating app use by people seeking same-gender partners; a cross-cultural comparison of the USA and UK.

**Hannah Madden – PhD Candidate, Public Health Department, Southern Connecticut State University (USA) & Public Health Institute, Liverpool John Moores University (UK)**

You are being invited to take part in a research study. Please read this information and take time to decide if you want to take part or not. If you have any questions, you can message the researcher via the Facebook page (<http://www.fb.me/DatingAppResearch>) or email: [H.C.Madden@LJMU.ac.uk](mailto:H.C.Madden@LJMU.ac.uk). There is no payment for taking part in this survey.

**1. What is the purpose of the study?** This study is part of a PhD research degree. The study aims to understand how people use smartphone dating apps (e.g. Tinder, Grindr, Jack'd, Her etc.) to find same-gender partners, relationships and friendships. We are comparing the USA and the UK and want to understand how people view any benefits or risks of these apps. This stage of the research is an online survey. The information you provide will not be used for any marketing purposes.

We are inviting people in **Connecticut** (USA) and **Merseyside** (UK) who have used a smart-phone dating app in the last 12 months to find a sexual partner, friendship or relationship with someone of the same gender. If you live outside these areas or you do not use dating apps to meet same gender partners, you are not eligible for this study.

**2. Do I have to take part?** No, you decide whether you want to take part. If you do want to take part, you will be asked to click NEXT at the bottom of this page. You can stop the survey at any time; we will delete incomplete surveys from the analysis. However, after you finish the survey we would not be able to remove you from the analysis, as we do not ask for any information we could use to find your responses in the full data. Most of the questions allow you to tick a "prefer not to say" option.

**3. What will happen to me if I take part?** If you decide to take part, you will be taken to an anonymous questionnaire hosted by the Bristol Online Survey tool. The questionnaire asks some basic questions

about you, how “out” you are, and how and why you use apps. We also ask some questions about sexual relationships and what you see as the benefits or risks of the apps. Some of the questions are personal or about your sexual behaviour, but you are free to skip these questions.

The survey will take approximately 15 minutes to complete and can be done on a smartphone, tablet or computer.

This is the first part of a bigger project and the researcher is planning to do interviews to explore the issues further. These are likely to happen towards the end of 2018 either online or face-to-face in Connecticut and Merseyside. If you would like to receive more information about these interviews there is a space at the end of the survey for your email address to get more information. Your email address will not be linked to your answers.

**4. Are there any risks / benefits to being involved?** The information we gather will be used to improve health promotion and may help services for people who have same-gender partners. It will not be used for any marketing purposes. There is no payment for taking part in our online survey.

Some of the questions are quite personal and ask about sexual behaviour - you may want to think where you are when you complete the survey. There are links to organisations that can provide information and support below. This information will be provided again at the end of the survey and on the Facebook page.

**5. Will my taking part in the study be kept confidential?** All the survey answers you give us will be anonymous and confidential. The survey contains no questions that we could use to identify you and you will not be asked for your name or address. After the survey is complete, you have the option to go to another page to enter your email address for us to contact you. If you do provide an email address we cannot link this to any of your answers as it is held in a separate database and it will only be used for contacting you about this research. Only the lead researcher will have access to your email address.

**This participant information sheet is available on our Facebook page and you can also download a copy to keep**

**here:** [https://static.onlinesurveys.ac.uk/media/account/292/survey/329103/question/pis\\_v6.pdf](https://static.onlinesurveys.ac.uk/media/account/292/survey/329103/question/pis_v6.pdf)

**This study has received ethical approval from LJMU’s Research Ethics Committee:** Approval reference 17/PHI/001, 3<sup>rd</sup> Oct 2017.

This study has also received IRB approval from Southern Connecticut State University (IRB number: 18-146)

#### **Contact Details of Researcher:**

Hannah Madden, PhD Student, Public Health Institute, Liverpool John Moores University, Henry Cotton

Building, 15-21 Webster Street, Liverpool, L3 2ET. UK. t: (+44) 0151 231 4088 e: [h.c.madden@2017.ljmu.ac.uk](mailto:h.c.madden@2017.ljmu.ac.uk)

### **Contact Details of Academic Supervisors:**

**USA:** Dr Jean Breny, Department of Public Health, Southern Connecticut State University, Orlando House, 144 Farnham Avenue, New Haven, CT 06515, USA. t: (+1) 203-392-7008 e: [brenyj1@southernct.edu](mailto:brenyj1@southernct.edu)

**UK:** Dr Lorna Porcellato, Public Health Institute, Liverpool John Moores University, Henry Cotton Building, 15-21 Webster Street, Liverpool, L3 2ET, UK. t: (+44) 0151 231 4201 e: [L.A.Porcellato@ljmu.ac.uk](mailto:L.A.Porcellato@ljmu.ac.uk)

### **Further support and information**

If you want any more information or support for your physical, sexual or mental health you can contact these organisations:

#### **USA:**

CDC LGBT health webpage: [www.cdc.gov/lgbthealth/index.htm](http://www.cdc.gov/lgbthealth/index.htm)

Fenway Health: [fenwayhealth.org/](http://fenwayhealth.org/)

#### **UK:**

NHS Choices LGBT health webpage [www.nhs.uk/livewell/lgbhealth/Pages/Gayandlesbianhealth.aspx](http://www.nhs.uk/livewell/lgbhealth/Pages/Gayandlesbianhealth.aspx)

Armistead Project (Liverpool) [www.liverpoolcommunityhealth.nhs.uk/health-services/sexual-health/armistead.htm](http://www.liverpoolcommunityhealth.nhs.uk/health-services/sexual-health/armistead.htm)

**I have read the information provided above and I am happy to participate. I understand that by completing this questionnaire I am consenting to be part of this research study and for my data to be used as described above.**

# Suitability

*This survey asks about smartphone applications where you create a profile and it shows you pictures and brief information about the other users near to you (e.g. Grindr, Tinder, Scruff, Her etc.) People use these apps for different reasons – they can be used to find sex, relationships, friendships and other reasons. We are not talking about general social media apps like Facebook, Instagram or Snapchat.*

*When writing this survey we have tried our best to use inclusive and non-discriminatory language. The main researcher is from the LGBTQ+ community so understands the importance and power of language. To make sure that we can compare findings from the two countries we have to use the same survey in the USA and the UK. We really hope you will forgive us if any of the language sounds insensitive or inappropriate; we have tried very hard to get it right across both countries.*

*In this survey, we use "sex" to mean physical contact to orgasm (or close to orgasm) for one or both partners.*

For this research we are seeking participants who currently, or have recently used, dating apps to find a sexual partner, romantic partner or a friend.

1. Have you used a cell phone/mobile phone dating app in the last 12 months to find someone of the same gender as you? \* Required

- ☐ Yes
- ☐ No
- ☐ Not sure

## Where you live

2. Where do you live? \* *Required*

- ☐ Merseyside, UK (including Knowsley, Halton, Liverpool, Sefton, St Helens and Wirral)
- ☐ Connecticut, USA
- ☐ Other



## Thank you

3. Thank you for your interest in the survey. However, this research is about people who use apps and live in Merseyside (UK) and Connecticut (USA). You are very welcome to read and complete the rest of the survey, however, we will be unable to use your data. What would you like to do? \* *Required*

- ☐ Exit the survey now
- ☐ Continue with the survey

## Area

4. In what kind of area do you live? \* *Required*

- ☐ Urban or city area
- ☐ Suburban area
- ☐ Small town
- ☐ Rural or countryside area
- ☐ Unsure
- ☐ Prefer not to say
- ☐ Other

4.a. If you selected Other, please specify:

## Sexual orientation

5. Which of the following options best describes how you think of yourself? \* Required

- ☐ Gay, lesbian or homosexual
- ☐ Bisexual
- ☐ Straight or heterosexual
- ☐ I don't usually use a term
- ☐ Prefer not to say
- ☐ Other, please state

5.a. If you selected Other, please specify:

*In this survey, we use "sex" to mean physical contact to orgasm (or close to orgasm) for one or both partners.*

6. During the past 12 months, have you had sex with people who are \* Required

- ☐ No one
- ☐ Only men
- ☐ Only women
- ☐ Only people who do not identify with a single gender/non-binary people
- ☐ Men and women
- ☐ Men, women and people who do not identify with a single gender
- ☐ Prefer not to say
- ☐ Other

6.a. If you selected Other, please specify:

7. Thinking about who you are sexually attracted to, which best describes your feelings? I am ... \* Required

- ☐ Attracted to no one
- ☐ Only attracted to the opposite gender
- ☐ Mostly attracted to the opposite gender
- ☐ Equally attracted to all genders
- ☐ Mostly attracted to the same gender
- ☐ Only attracted to the same gender
- ☐ Not sure or uncertain
- ☐ Prefer not to say
- ☐ Other

7.a. If you selected Other, please specify:

## About you

8. How would you describe your gender? \* *Required*

- ☐ Woman (including trans woman)
- ☐ Man (including trans man)
- ☐ Non-binary/genderqueer
- ☐ Prefer not to say
- ☐ Other way, please state:

8.a. If you selected Other, please specify:

8.b. Is this the gender you were assigned at birth? \* *Required*

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

9. What is your age? (in years) *Optional*

10. What is your relationship status? \* *Required*

- ☐ Single
- ☐ In a steady or long-term relationship
- ☐ Co-habiting or living together with partner
- ☐ Married
- ☐ In a civil partnership (UK only)
- ☐ Prefer not to say
- ☐ Other

10.a. If you selected Other, please specify:

## Your relationship

11. If you are in a relationship, is this with: \* *Required*

- ☐ A man (including transmen)
- ☐ A women (including transwomen)
- ☐ A non-binary person
- ☐ Prefer not to say
- ☐ Other, please state

11.a. If you selected Other, please specify:

12. Is your relationship sexually monogamous and exclusive? \* *Required*

- ☐ No – we have an open relationship where I and/or they can have other sexual partners
- ☐ Yes - neither of us have other sexual partners
- ☐ Unsure
- ☐ Prefer not to say
- ☐ Other, please state

12.a. If you selected Other, please specify:



## Your health

Now we want to ask a few questions about your health. If you do not want to answer these you can choose the "prefer not to say" option.

**13.** At what age did you first have sex with a person of the same gender as you? *(Answer in whole years or leave blank. If you aren't sure please estimate)*

*In this survey, we use "sex" to mean physical contact to orgasm (or close to orgasm) for one or both partners.*

**14.** What is your HIV status? \* *Required*

- ☐ Positive
- ☐ Negative
- ☐ Unsure
- ☐ Prefer not to answer

**15.** When was your last HIV test? \* *Required*

- ☐ Never
- ☐ In the last 6 months
- ☐ 6-12 months ago
- ☐ 1-2 years ago
- ☐ Over 2 years ago
- ☐ Unsure
- ☐ Prefer not to answer

**16.** When was your last STI/STD test? \* *Required*

- ☐ Never
- ☐ In the last 6 months
- ☐ 6-12 months ago
- ☐ 1-2 years ago
- ☐ Over 2 years ago
- ☐ Unsure
- ☐ Prefer not to answer

## Your social circle

**17.** Use the following rating scale to indicate how open you are about your sexual orientation to the people listed below. Try to respond to all of the items, but choose "not relevant" if they do not apply to you. If an item refers to a group of people (e.g., work peers), then indicate how out you generally are to that group.

	How open you are about your sexual orientation status... * <i>Required</i>							
	1 - person definitely does NOT know	2 - person might know, but it is NEVER talked about	3 - person probably knows, but it is NEVER talked about	4 - person probably knows, but it is RARELY talked about	5 - person definitely knows, but it is RARELY talked about	6 - person definitely knows, and it is SOMETIMES talked about	7 - person definitely knows, and it is OPENLY talked about	N/A - not relevant to me
1. Mother	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
2. Father	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
3. Siblings (sisters, brothers)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
4. Extended family/relatives	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
5. My new straight friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
6. My work peers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1 = person definitely does NOT know about your sexual orientation status

2 = person might know about your sexual orientation status, but it is NEVER talked about .

3 = person probably knows about your sexual orientation status, but it is NEVER talked about

4 = person probably knows about your sexual orientation status, but it is RARELY talked about

5 = person definitely knows about your sexual orientation status, but it is RARELY talked about

6 = person definitely knows about your sexual orientation status, and it is SOMETIMES talked about

7 = person definitely knows about your sexual orientation status, and it is OPENLY talked about

**18.** Use the following rating scale to indicate how open you are about your sexual orientation to the people listed below. Try to respond to all of the items, but choose "not relevant" if they do not apply to you. If an item refers to a group of people (e.g., work peers), then indicate how out you generally are to that group.

	How open you are about your sexual orientation status... * Required							
	1 - person definitely does NOT know	2 - person might know, but it is NEVER talked about	3 - person probably knows, but it is NEVER talked about	4 - person probably knows, but it is RARELY talked about	5 - person definitely knows, but it is RARELY talked about	6 - person definitely knows, and it is SOMETIMES talked about	7 - person definitely knows, and it is OPENLY talked about	N/A - not relevant to me
7. My work supervisor(s)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
8. Members of my religious community (e.g., church, temple)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
9. Leaders of my religious community (e.g., church, temple)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
10. Strangers, new acquaintances	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
11. My old heterosexual friends	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

1 = person definitely does NOT know about your sexual orientation status

2 = person might know about your sexual orientation status, but it is NEVER talked about .

3 = person probably knows about your sexual orientation status, but it is NEVER talked about

4 = person probably knows about your sexual orientation status, but it is RARELY talked about

5 = person definitely knows about your sexual orientation status, but it is RARELY talked about

6 = person definitely knows about your sexual orientation status, and it is SOMETIMES talked about

7 = person definitely knows about your sexual orientation status, and it is OPENLY talked about

19. What proportion of your friends are LGBTQ+? \* Required

- ☐ All of them
- ☐ Almost all of them
- ☐ More than half of them

- ☐ Approximately half of them
- ☐ Less than half of them
- ☐ Almost none of them
- ☐ None of them
- ☐ Unsure
- ☐ Prefer not to answer

## Discrimination

20. Would you describe yourself as being a member of a group that is discriminated against in your country? \* *Required*

- ☐ Yes
- ☐ No
- ☐ Unsure
- ☐ Prefer not to say

## Discrimination, contin...

21. If yes, on what grounds is your group discriminated against? (Tick as many as apply) \* *Required*

Please select at least 1 answer(s).

- ☐ Colour or race
- ☐ Nationality
- ☐ Religion
- ☐ Language
- ☐ Ethnic group
- ☐ Age
- ☐ Sex (being male or female)
- ☐ Gender (being masculine or feminine)
- ☐ Sexuality/sexual orientation
- ☐ Disability
- ☐ Prefer not to answer
- ☐ Other, please describe your answer

21.a. If you selected Other, please specify:



## More about you

22. We want to ask a few more questions about your income, education and ethnicity/race but how we ask the questions depends on your country. Please remind us where you live so we can show you the appropriate questions. \* *Required*

- ☐ I live in the USA
- ☐ I live in the UK
- ☐ I do not live in either of these places

# USA

We want to understand a bit more about you and see how different people use these kind of apps.

If you do not want to answer these questions you can choose "prefer not to say".

23. In which area of Connecticut do you live?

- ☐ Fairfield County
- ☐ Hartford County
- ☐ Litchfield County
- ☐ Middlesex County
- ☐ New Haven County
- ☐ New London County
- ☐ Tolland County
- ☐ Windham County
- ☐ Prefer not to say
- ☐ Other

23.a. If you selected Other, please specify:

24. What was your personal income last year from all sources, before taxes? \* Required

- ☐ under \$10,000
- ☐ \$10,000 to \$24,999
- ☐ \$25,000 to \$39,999
- ☐ \$40,000 to \$54,999
- ☐ \$55,000 to \$69,999
- ☐ \$70,000 to \$84,999
- ☐ Over \$85,000
- ☐ Prefer not to answer

25. What is the highest level of education you completed? \* Required

- ☐ Never attended school
- ☐ Grades 1 through 8
- ☐ Grades 9 through 11
- ☐ Grade 12 or GED
- ☐ Some college, Associate's Degree, or Technical Degree
- ☐ Bachelor's Degree
- ☐ Any post graduate studies
- ☐ Prefer not to say

26. Which of the following best describes your race? \* Required

- ☐ White
- ☐ Black or African American
- ☐ Hispanic or Latino
- ☐ Asian/Pacific Islander
- ☐ Multiracial
- ☐ Prefer not to say
- ☐ Other, please state

26.a. If you selected Other, please specify:

We want to understand a bit more about you and see how different people use these kind of apps.

If you do not want to answer these questions you can choose "prefer not to say".

**27.** In which local authority area do you live? (If you are not sure, think about who collects your bins?)

*\* Required*

- ☐ Halton
- ☐ Liverpool
- ☐ Knowsley
- ☐ Sefton
- ☐ St Helens
- ☐ Wirral
- ☐ Prefer not to say
- ☐ Other

**27.a.** If you selected Other, please specify:

**28.** What was your personal income last year from all sources, before tax? *\* Required*

- ☐ under £10,000
- ☐ £10,000 to £24,999
- ☐ £25,000 to £39,999
- ☐ £40,000 to £54,999
- ☐ £55,000 to £69,999
- ☐ £70,000 to £84,999
- ☐ Over £85,000
- ☐ Prefer not to say

29. What is the highest level of education you have completed? \* *Required*

- ☐ None
- ☐ Qualifications at 16 (GCSE, NVQ, O-Levels)
- ☐ Qualifications at 18 (A levels, AS Levels, high school diploma, BTEC Level 3)
- ☐ Further education college/HND/HNC/City & Guilds or equivalent
- ☐ Undergraduate degree
- ☐ Postgraduate degree or higher
- ☐ Prefer not to say

30. Which of these best describes your ethnicity? \* *Required*

- ☐ White or white British
- ☐ Mixed
- ☐ Asian or Asian British
- ☐ Black or black British
- ☐ Prefer not to say
- ☐ Other, please state

30.a. If you selected Other, please specify:

## Using dating apps

**31.** If you were looking for a sexual partner or relationship with someone of the same gender – where would you look? (Tick all that apply)? \* *Required*

Please select at least 1 answer(s).

- ☐ A LGBT/gay bar, disco or nightclub
- ☐ A straight/non-gay bar, disco or nightclub
- ☐ A LGBT community centre, café, gay organisation or gay social group
- ☐ A straight/non-gay organisation or social group
- ☐ Through one of your friends or family
- ☐ On a smart-phone dating app
- ☐ A backroom/darkroom of a bar, gay sex club, a public gay sex party
- ☐ A gay sex party in a private home
- ☐ On social media (i.e. Facebook, Instagram, etc)
- ☐ A gay sauna/bathhouse
- ☐ A cruising location (street, roadside service area, park, beach, baths, lavatory)
- ☐ A website for LGBT people
- ☐ Prefer not to say
- ☐ Somewhere else, please state

**31.a.** If you selected Other, please specify:

**32.** Thinking about the last person of the same gender who you had sex with, where did you first meet that person? \* *Required*

- ☐ A LGBT/gay bar, disco or nightclub
- ☐ A straight/non-gay bar, disco or nightclub
- ☐ A LGBT community centre, café, gay organisation or gay social group
- ☐ A straight/non-gay organisation or social group
- ☐ Through one of your friends or family
- ☐ On a smart-phone app dating app
- ☐ A backroom/darkroom of a bar, gay sex club, a public gay sex party
- ☐ A gay sex party in a private home

- ☐ On social media (i.e. Facebook, Instagram, etc)
- ☐ A gay sauna/bathhouse
- ☐ A cruising location (street, roadside service area, park, beach, baths, lavatory)
- ☐ A website for LGBT people
- ☐ Unsure/cannot remember
- ☐ Prefer not to say
- ☐ Other

32.a. If you selected Other, please specify:

33. At what age did you first start using dating apps to find relationships or sexual partners of the same gender? (We mean cell/mobile phone apps, not dating websites). \* *Required*

*In years - if you are unsure please estimate.*



# Use of dating apps

34. For each of these apps please tell us which you use or have used. *Some of these apps are aimed at particular groups or communities so may not be relevant to you.*

	For each of the apps below, please tell us which you use * Required			
	I have a current profile	I did have a profile but it is now deleted/deactivated	I have never had a profile	Prefer not to say
Bender	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Blued	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Bumble	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Grindr	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
GROWLr	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Happn	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
HER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hornet	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Jack'd	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
POF/Plenty of Fish	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Planet Romeo	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Scruff	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tinder	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other apps - please state below	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

35. This list could not include all the possible dating apps. If you currently use any other dating apps to meet people please state here:

## Your use of apps

36. Which of these describe your reasons for using these apps? (Tick all that apply) \*

Required

Please select at least 1 answer(s).

- ☐ I want to 'kill time' when bored
- ☐ I want to make friends with other gay and bisexual people
- ☐ I want to meet other gay and bisexual people to date
- ☐ I want to find a boyfriend/girlfriend or other romantic partner
- ☐ I want to meet other gay and bisexual people to have sex with
- ☐ Prefer not to say
- ☐ Other, please tell us more

36.a. If you selected Other, please specify:

37. Which of these would you say is the **main reason** you use these apps? (Tick one) \* Required

- ☐ I want to 'kill time' when bored
- ☐ I want to make friends with other gay and bisexual people
- ☐ I want to meet other gay and bisexual people to date
- ☐ I want to find a boyfriend/girlfriend or other romantic partner
- ☐ I want to meet other gay and bisexual people to have sex with
- ☐ Other, please tell us more
- ☐ Prefer not to say

37.a. If you selected Other, please specify:

Some people use more than one app and will use different apps for different purposes.

38. If you were looking for casual sex/hook up with someone of the same gender which app are you most likely to use?

- ☐ Bender
- ☐ Blued
- ☐ Bumble
- ☐ Grindr
- ☐ GROWLr
- ☐ Happn
- ☐ HER
- ☐ Hornet
- ☐ Jack'd
- ☐ POF/Plenty of Fish
- ☐ Planet Romeo
- ☐ Scruff
- ☐ Tinder
- ☐ Unsure
- ☐ None of these
- ☐ Prefer not to say
- ☐ Other, please state

38.a. If you selected Other, please specify:

39. If you were looking for a serious relationship or a boyfriend/girlfriend which app are you most likely to use?

- ☐ Bender
- ☐ Blued
- ☐ Bumble

- ☐ Grindr
- ☐ GROWLr
- ☐ Happn
- ☐ HER
- ☐ Hornet
- ☐ Jack'd
- ☐ POF/Plenty of Fish
- ☐ Planet Romeo
- ☐ Scruff
- ☐ Tinder
- ☐ Unsure
- ☐ None of these
- ☐ Prefer not to say
- ☐ Other, please state

39.a. If you selected Other, please specify:

## How you use apps

For this section we are interested in how you currently use dating apps. If you no longer use apps please estimate the answers from when you last used apps

40. On average, how many times do you open or log on to these apps each day? *(Answer in whole numbers or leave blank, if you aren't sure please estimate)* *Optional*

Please enter a whole number (integer).

Please make sure the number is between 0 and 150.

41. On average, how many minutes do you spend on these apps each day? *(Answer in whole numbers or leave blank, if you aren't sure please estimate)*

Please enter a whole number (integer).

Please make sure the number is between 0 and 500.

42. On average, how many messages do you send on these apps each day? *(Answer in whole numbers or leave blank, if you aren't sure please estimate)*

Please enter a whole number (integer).

Please make sure the number is between 0 and 500.

43. How many of your LGBTQ+ friends use apps to find sexual partners and/or relationships? \*  
*Required*

- ☐ All
- ☐ Most but not all
- ☐ Many
- ☐ Some

- ☐ A few
- ☐ None
- ☐ Unsure
- ☐ Prefer not to say

44. Do you currently use smartphone dating apps to find sexual partners/relationships with people of the **opposite** sex? \* *Required*

- ☐ Yes
- ☐ No
- ☐ Prefer not to say

45. If these kind of apps had not been invented, what other ways would you use to find sexual partners or relationships with people of the same gender?

## Your sexual partners

Now we would like you to think about the people you have met on these apps and had sex with – these may be people who you were in a steady relationship with or people who you just met for casual sex.

46. Are the sexual partners you meet on the apps any different from partners you met before using apps? (tick all that apply) \* *Required*

- ☐ App partners are no different
- ☐ App partners are “more like me”
- ☐ I have more partners now I use apps
- ☐ App partners are closer to my age
- ☐ App partners live closer to me
- ☐ App partners are more “my type”
- ☐ App partners are easier to meet
- ☐ I didn’t meet same gender partners before using apps
- ☐ Prefer not to say
- ☐ Other, please tell us more

46.a. If you selected Other, please specify:

47. In the last 12 months, approximately how many people of your own gender have you had sex with? (Answer in whole numbers or leave blank, if you aren’t sure please estimate)

*In this survey, we use “sex” to mean physical contact to orgasm (or close to orgasm) for one or both partners.*

47.a. In the last 12 months, approximately how many of these people did **you meet on a smartphone dating app?** (Answer in whole numbers or leave blank, if you aren’t sure please estimate)



*In this survey, we use "sex" to mean physical contact to orgasm (or close to orgasm) for one or both partners.*

48. Over the last 12 months how often have you had sex with a same gender partner you met on an app? \* *Required*

- ☐ At least once a day
- ☐ More than once a week, but not every day
- ☐ Once a week
- ☐ Less often than once a week
- ☐ Less than once a month
- ☐ Once every 2-3 months
- ☐ Less often
- ☐ Have not had sex with someone I met on an app
- ☐ Prefer not to say

*In this survey, we use "sex" to mean physical contact to orgasm (or close to orgasm) for one or both partners.*

## Risks and benefits of apps

49. What do you think are the benefits of using these types of apps and of meeting people through these apps?

*Remember the apps we are talking about are smartphone applications where you create a profile and it shows you pictures and brief information about the other users near to you (e.g. Grindr, Tinder, Scruff, Her etc.)*

*People use these apps for different reasons – they can be used to find sex, relationships, friendships and other reasons. We are not talking about general social media apps like Facebook, Instagram or Snapchat.*

50. Is there anything you worry about when using the apps and meeting people through these apps?

51. Have you had any negative experiences when using these apps that you would like to tell us about?

52. Is there anything else you want to tell us about how or why you use these apps?

This is the end of the questions. Once you press the FINISH button below you will not be able to go back and amend you answers.

# End

Thank you for answering the questions. That is the end of the survey.

If you would like to receive information about the findings of this research or receive information about the next phase of the research, please click the link below.

The link takes you to a separate page so that your email address is held in a different database. This ensures your answers to the questions above remain totally anonymous.

**To receive information about our findings or about the next phase of the research please click here:** <https://ljmu.onlinesurveys.ac.uk/for-further-information>

**If you want any more information about this research, you can contact the researcher at:**

Hannah Madden. Public Health Institute, Liverpool John Moores University. Henry Cotton Building, 15-21 Webster Street, Liverpool, L3 2ET. United Kingdom. t: (+44) 0151 231 4088 e: [h.c.madden@2017.ljmu.ac.uk](mailto:h.c.madden@2017.ljmu.ac.uk)

**This participant information sheet is available on our Facebook page and you can also download a copy to keep**

**here:** [https://static.onlinesurveys.ac.uk/media/account/292/survey/329103/question/pis\\_v5.pdf](https://static.onlinesurveys.ac.uk/media/account/292/survey/329103/question/pis_v5.pdf)

## **Contact Details of Academic Supervisors:**

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**If you want any more information or support for your physical, sexual or mental health you can access these organisations:**

## **UK:**

NHS Choices LGBT health webpage [www.nhs.uk/livewell/lgbhealth/Pages/Gayandlesbianhealth.aspx](http://www.nhs.uk/livewell/lgbhealth/Pages/Gayandlesbianhealth.aspx)

Armistead Project (Liverpool) [www.liverpoolcommunityhealth.nhs.uk/health-services/sexual-health/armistead.htm](http://www.liverpoolcommunityhealth.nhs.uk/health-services/sexual-health/armistead.htm)

## **USA:**

CDC LGBT health webpage: [www.cdc.gov/lgbthealth/index.htm](http://www.cdc.gov/lgbthealth/index.htm)

Fenway Health: <http://fenwayhealth.org/>

