The Relations between ADHD Behaviours, Social and Communication Traits of Autism, Attachment Characteristics, Teacher Perception and Management of Student Behaviour and the Self-Concept in Adolescents

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Definition of Key Terms:

Key-Stages: Specific stages of the national curriculum that divides children into groups by age which then dictates the curriculum which will be taught to children and adolescents. There are currently four key stages; key stage one that covers 5-7-year-olds, key stage two which is 7-11-year-olds, key stage three is 11-14-year-olds and finally key stage four is 14-16-year-olds.

Attention Deficit Hyperactivity Disorder: Attention deficit hyperactivity disorder, or ADHD, as defined by the diagnostic and statistical manual of mental health disorders (DSM; American Psychiatric Association, 2013) is a neurodevelopmental condition that is characterised by symptoms of inattention, hyperactivity and impulsivity that must be inconsistent with an individuals' level of development.

ADHD Behaviours: Defined in this thesis as the behaviours associated with ADHD (inattention, impulsivity and hyperactivity) which includes those levels of behaviour that may fall below the clinical threshold at which ADHD would be diagnosed.

Autism Spectrum Disorder/Autism: Autism spectrum disorder (ASD) or Autism for short, is a neurodevelopmental condition that, according to the DSM (American Psychiatric Association, 2013), is characterised by symptoms of difficulty in communication and social interaction and stereotypic/rigidity of behaviour.

Autistic Traits: Identifying features of Autism, such as problems with social interaction, communication and stereotypic, rigid behaviour. As with ADHD behaviours, these may fall below the diagnostic threshold and be distributed in a "neurotypical" population.

Attachment: Attachment, as defined by Ainsworth (1969), is a reciprocal, emotional bond between two people that spans space and time. Early attachment experiences form a blueprint

for later relationships and inform developmental competencies, distress tolerance communication and other developmental behaviours.

Attachment Characteristics: Identifying characteristics of attachment patterns that, in this thesis, include latent feelings of anger and distress, perceived emotional availability of the attachment figure and the goal-corrected partnership between the attachment figure and child/adolescent.

The Self-Concept: The working definition of self-concept utilised and accepted in this doctoral thesis is taken from Marsh and Shavelson's (1985) seminal work on conceptualising and defining the self-concept. They define the self-concept as a responsive construct that is multifaceted, hierarchical, evaluative and descriptive.

General Self-Esteem: The definition of general self-esteem accepted and used in this thesis comes from the third Self-Description Questionnaire (Marsh & O'Neill, 1984) which defines general self-esteem as the individuals' ratings of their efficacy, capability and self-satisfaction.

The Academic Self-Concept: The academic self-concept is an individual's perception of their academic functioning (Trautwein et al., 2006). The definition of the academic self-concept comes from the third Self-Description Questionnaire (Marsh & O'Neill, 1984) that defines the academic self-concept as general/overall ratings of academic skill and ability.

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Abstract

This doctoral thesis aimed to explore how dimensional, co-occurring models of ADHD behaviours, Autistic traits and attachment characteristics relate to the academic self-concept and general self-esteem and how teachers' interviews on their perception and management of ADHD behaviours, Autistic traits and attachment characteristics may illuminate the relation. To evaluate the relations between ADHD behaviours, Autistic traits, attachment characteristics and the academic self-concept and general self-esteem, a three-phase, mixedmethods study was conducted. In the first phase, the Adult ADHD Self-Report Scale v.1.1 (ASRS; Kessler et al., 2005), the Autism Spectrum Quotient 10 (AQ-10; Allison et al., 2012) and the Adolescent Attachment Questionnaire (AAQ; West et al., 1998) were revised and validated through cognitive interviewing and confirmatory factor analyses. Validation of the AAQ was based on a sample of 303 adolescents aged 12-16 collected from one school whereas validation of the AQ-10 and ASRS took place concurrently using a sample of 296 adolescents collected from three schools and four sixth-form colleges in the UK. These measures were then used in the second phase of the study. This used latent-interaction structural equation modelling to assess the relations between ADHD behaviours, Autistic traits, attachment characteristics and the academic self-concept and general self-esteem of 564 sixth-form students aged 16-19. The sample came from five sixth-form colleges in the UK. Finally, the third phase of the study used snowball sampling to generate a group of 12 UK secondary school teachers who were interviewed on their perception and management of behaviours, associated with ADHD, autism and attachment disorders. Data collected from the interviews were analysed using inductive, semantic thematic analysis. The subsequent thematic analysis of the teacher interviews suggests that teachers' responses to and management of these behaviours were informed by their experiences and educational guidance. Seven themes were identified. They were resilience, enthusiasm, individual

adjustments, behavioural management, classroom dynamics, teacher support and time. Interviews highlighted that teachers approach and manage ADHD behaviours, Autistic traits and attachment characteristics through individual adjustments or behavioural management strategies. Teachers also appeared to consider all behaviours they were interviewed about to be indicative of SEND, despite this not being referenced in the interview questions. The findings of the thematic analysis were then applied to the findings of phase two of this PhD project through critical realist retroduction to determine how teacher responses may explain the relations demonstrated in phase two. Synthesis of the quantitative and qualitative results suggests that there is an unexpected, potentially adverse element to the positive adjustments made in line with statutory professional principles set out in the Teachers' Standards. As the self-concept is informed by feedback, this could be construed as highlighting differences and deficits or that the teachers have less confidence in the student's ability. This could explain why ADHD behaviours, social and communication traits of Autism and attachment characteristics were found to negatively predict both the academic self-concept and general self-esteem of students. However, further research is needed to test and confirm this hypothesis.

Chapter 1 - Introduction

1.1 Background

Past research has demonstrated that conditions such as attention deficit hyperactivity disorder (ADHD), Autism spectrum disorder (ASD or Autism henceforth) and insecure attachment patterns are adversely related to both the academic self-concept and the general self-esteem of individuals (Bacro, 2012; Doyle et al., 2000; Foley-Nicpon et al., 2012; Hay & Ashman, 2003; Houck et al., 2011; McCauley et al., 2018; Nishikawa et al., 2010). Furthermore, ADHD, Autism and insecure attachment patterns are well documented to be cooccurring (Finzi-Dottan et al., 2006; Joshi et al., 2017; Rutgers et al., 2007; Storebø et al., 2016; Teague et al., 2020) and dimensional constructs (American Psychiatric Association, 2013; Coghill & Sonuga-Barke, 2012; Fraley & Spieker, 2003a; Frazier et al., 2007; Marcus & Barry, 2011), although this has not been adequately acknowledged in past research on both the academic self-concept and general self-esteem of individuals. Indeed, much of the past self-concept research has focused on the relations between ADHD, Autism and attachment with both the academic self-concept and general self-esteem as individual relations. Although this fails to acknowledge potentially co-occurring extraneous variables (such as co-occurring, unrecognised ADHD behaviours in an individual who has Autistic traits for example) that could also be implicated in the relations.

1.1.1 The Dimensional Nature of ADHD Behaviours, Autistic Traits and Attachment Characteristics

ADHD and Autism tend to be considered as examples of pathology. This is due to the adverse implications the presence of behaviours associated with each construct has for

individuals manifesting them and the atypical nature of the behaviours (see American Psychiatric Association, 2013). Attachment patterns, however, are not usually considered to be examples of pathology although certain attachment patterns are considered to be disorders (see reactive attachment disorder, for example, [American Psychiatric Association, 2013]). Attachment patterns are instead better thought of as a risk factor for later pathology (Mikulincer & Shaver, 2012). Despite the differences between these constructs, they all tend to be considered categorically. That is to say, Autism and ADHD are either diagnosed or not (present or absent) and attachment is conceptualised into specific styles. There is a movement away from this taxonomic approach, however, as research is beginning to show that ADHD, Autism and attachment are perhaps best thought of dimensionally as opposed to categorically. Indeed, the DSM-V currently requires Autism and ADHD as conditions to be rated in severity (American Psychiatric Association, 2013), although Autism has long been suggested to manifest as a spectrum (National Health Service [NHS], 2019). Research suggests that the symptoms of ADHD do not differ qualitatively from normal behaviour, only quantitatively (Coghill & Sonuga-Barke, 2012; Frazier et al., 2007; Marcus & Barry, 2011). This means that they are "atypical" because they present as extreme variations of relatively typical behaviour. This in turn suggests a dimensional model with ADHD behaviours present as a continuum of manifestation and a diagnosis being the most extreme form. Furthermore, attachment styles, as opposed to dimensions, have been criticised as failing to sufficiently capture the nuances of attachment behaviour (Fraley & Spieker, 2003a). Indeed, research now highlights dimensional constructs of avoidance and anxiety in attachment patterns that have already been integrated into the understanding of adult attachments. As of yet, however, a dimensional model of attachment has not been as closely integrated into child and adolescent attachments (Mikulincer & Shaver, 2007; Simpson & Rholes, 1998). Therefore,

these concepts are best considered as a continuum. The respective dimensionality of ADHD, ASD and attachment remain important however and will be discussed in more detail below.

1.1.2 The Co-Occurrence between ADHD Behaviours, Autistic Traits and Attachment Disruption

There is frequent documentation of co-occurrence between certain attachment patterns, ADHD and Autism. Research has shown that insecure attachment styles are closely related to ADHD diagnoses (Finzi-Dottan et al., 2006; Storebø et al., 2016) and Autism (Rutgers et al., 2007; Teague et al., 2020) and that Autism and ADHD are closely related (Joshi et al., 2017). The frequent nature of their co-occurrence has led to them being called "comorbid", which is the co-occurrence of two (or more) distinct clinical entities (Feinstein, 1970) and is generally common in mental health conditions (Van Loo et al., 2013). In addition to questions about the distinction between the entities, some have even questioned if they are different manifestations of the same entity (see Van der Meer et al., 2012). However, research has demonstrated that ADHD and Autism have distinct profiles that can be suitably differentiated, despite them being empirically related. A review by Johnson et al. (2015) argued that differential early pathways to the disorders rule out a common overarching disorder. Further evidence of the distinctions between the two can be seen in the work of Ronald et al. (2014), where component analysis and symptom domain clustering of over 17,000 twin pairs demonstrated that factors were found to split into three ASD and three ADHD symptom domains, with some symptom domains clustering together. A two-factor model of ASD and ADHD fit the data showing two latent "ASD" and "ADHD" factors with high genetic overlap. All subdomains showed significant genetic and environmental influences on aetiology. Finally, cognitive profiles between the two are differentiable with subjects with ASD or ADHD performing differently on verbal intelligence and performance intelligence tasks (Kanai et al., 2017).

Despite large evidence showing differences between the concepts, it is impossible to ignore that they do occur together remarkably frequently. Potential reasons for the co-occurrence of ADHD and Autism are debated. The most common suggestion is of shared risk factors, both genetic and environmental between the conditions. Indeed, research by Ronald et al. (2008) found genetic overlap between both ASD and ADHD to be r > .50 with the remainder of the genetic influences specific to each. Other research has found similar results highlighting an overlap of 50-72% in contributing genetic factors for both disorders (Leitner, 2014). Environmental aetiological factors have been suggested to act via epigenetic mechanisms, altering modifications of gene expression to induce ASD/ADHD traits in the individual (Grafodatskaya et al., 2010; Smith et al., 2009). Collectively, this research suggests a need to reject the notion of comorbidity between ADHD, Autism and attachment issues and instead to acknowledge co-occurrence due to shared risk factors between the conditions. This informs the approach taken in this doctoral thesis.

Regardless of whether we conceptualise the relations between ADHD, Autism and attachment patterns as comorbid or simple co-occurrence, research has suggested that the manifestation of ADHD, Autism and insecure attachment patterns together can lead to a more complex manifestation in the individual with a greater deficit experienced (Newcorn et al., 2007). For example, the presence of both ADHD and ASD is associated with greater academic disengagement and poorer psychological health in females specifically (Sturm & Kasari, 2019). Furthermore, the presence of both separation anxiety and additional comorbidity was associated with worse functional impairment than in those without any diagnosis or only separation anxiety (Mychailyszyn et al., 2010). The exact reason why this occurs is unknown, but may be due to an interaction between the constructs. For example, research has demonstrated that attachment difficulties are associated with greater severity of ADHD behaviours (Eyuboglu & Eyuboglu, 2020). In contrast, children with secure attachments have been shown to have a protective effect on attentional performance in continuous performance test tasks compared to insecure children (Pasco Fearon & Belsky, 2004). This suggests that, as attachment patterns move from secure to insecure, problems with ADHD behaviours may increase, indicating a potential moderating element between attachment and ADHD. Indeed, if Autism, ADHD and attachment are best considered to be dimensional constructs, each may have a moderating effect on the other that may help explain the apparent complexity that comes with co-occurrence.

Despite this co-occurrence between the concepts, self-concept research tends to have failed to look at ADHD behaviours, Autistic traits and attachment characteristics in tandem with the self-concept, or to explore the potential interaction between them. Failure to acknowledge multiple concepts present could lead to assumptions that relations are due to one particular construct, for example, ADHD behaviours, rather than a co-occurring factor. Indeed, Rutter (1997) argued that ignoring co-occurrence between conditions in research may lead to findings being assumed to be from one condition, which may instead be the consequence of another condition with which the original condition is frequently found.

1.1.3 The Link between ADHD Behaviours, Autistic Traits, Attachment Characteristics, Teacher Feedback and the Academic Self-Concept and General Self-Esteem

An individual's self-concept is associated with a range of important factors such as both their mental health and academic functioning (Bodkin-Andrews et al., 2010; Marsh et al., 2004; Pullmann & Allik, 2008; Suldo & Shaffer, 2008; Suldo et al., 2011) and is informed by the feedback received from others and social comparative processes (Bouchey & Harter, 2005; Buhs, 2005; Cole et al., 1997; Gniewosz, 2010; Gniewosz et al., 2012; Marsh & Hau, 2004). Given the importance of the self-concept in both academic and general functioning and the already established link between ADHD, Autism and attachment and the academic self-concept and general self-esteem in particular, it is important to understand further the roles that teachers play in the formation of the self-concept.

The interpretation of student behaviour in the classroom is achieved through reference to both social and societal expectations and cues. For example, hyperactive or aggressive behaviour in the classroom is considered abnormal as it breaks the behavioural norms and assumptions of student behaviour and is objectively different to the presented behaviour of other students. Atypical behaviour in the classroom such as hyperactivity or aggression, for example, is potentially disruptive to the child and other students' learning (Hinshaw, 1992) and can present as a barrier to appropriate functioning in the classroom and academic success. Due to this, it is often interpreted as "pathological" (Singh, 2008). Teachers must therefore intervene to appropriately manage this behaviour and support the child exhibiting it. Behaviours such as hyperactivity are also often considered to be indicative of a special educational need or disability (SEND). This is because the behaviour is atypical, disruptive and contrary to academic functioning, which conflates with how SEND is defined in education and the way teachers are taught and consider student behaviour. Indeed, teachers consider misbehaviour as any behaviour that negatively affects a child's learning, other children's learning or responses, or the teacher's ability to operate (Giallo & Little, 2003; Merrett & Wheldall, 1984), and the SEND Code of Practice (Department for Education & Department for Health, 2015) defines a special educational need as a "greater difficulty in learning than the majority of others of the same age" (p. 16). Thus, any behaviour that interferes with a child's learning can be interpreted as both misbehaviour and/or SEND. In cases such as this, teachers must follow the guidance to adapt their teaching and support those students with atypical behaviours and difficulties.

However, adapting teaching for a student considered to be "SEND" creates a form of feedback different from the usual one found in a class. Adjustments and even categorisation

of a child as SEND can implicitly send a message that the teacher thinks the student may be low ability, or unable to perform without adjustments. This could be interpreted by students as negative feedback which would adjust the self-concept adversely, affirming a belief that they are incapable of success without adjustments. However, it is not only the adjustments to perceived SEND students and those interactions which alter a student's self-concept. It is all interactions, even with other pupils. Students will see praise and sanctions delivered to students for performance, behaviour and other such stimuli which then influences their academic self-concept and general self-esteem (see Marsh, 1986a; Marsh, 1987; Marsh, 1990a; Marsh et al., 1999; Marsh et al., 2018; Marsh & Craven, 2006; Marsh & Hau, 2003; Marsh & O'Mara, 2008; Marsh & Yeung, 2001). Therefore, given the myriad of students in a classroom and the number of unique interactions between student and teacher, there is a need to gain greater insight into how these interactions may influence the student's academic selfconcept and general self-esteem.

1.2 Problem Statement and Research Purpose

This doctoral thesis aims to explore how co-occurring ADHD behaviour, Autistic traits, attachment characteristics and teacher interpretation and management of these concepts relate to the academic self-concept and general self-esteem of sixth-form college students. Past research has focused heavily on the relations between categorical, individual models of ADHD, Autism and attachment with the academic self-concept and general self-esteem. Due to this limited focus it has consequently failed to acknowledge the dimensional nature of these concepts and the co-occurrence between them in relation to the academic self-concept and general self-esteem. Furthermore, there is little understanding of how teacher interpretation and management of atypical student behaviours, such as ADHD behaviours, Autistic traits or certain attachment characteristics may be implicated in the formation of the academic self-concept and general self-esteem.

To address these gaps in understanding, this research sought to explore the relations between ADHD behaviours, Autistic traits, attachment characteristics and the academic selfconcept and general self-esteem. In addition to this, this research sought to explore teacher interpretation and management of ADHD behaviours, Autistic traits and attachment characteristics in the classroom and the implications of this for the academic self-concept and general self-esteem of students. This was explored through a sequential, three-phase, mixedmethods design which will be presented in the chronological order in which the research was conducted. The first phase involved preliminary studies to change and validate existing measures of ADHD, Autism and attachment through the use of construct validations in order to make them more suitable for use in this research. The findings of these construct validations will be both presented and discussed in Section 4.

The second phase aimed to explore exactly how ADHD behaviours, Autistic traits and attachment characteristics relate to the academic self-concept and general self-esteem of students through structural equation modelling (SEM) and the creation of a latent interaction structural equation model (LI-SEM). This aimed to determine whether co-occurring ADHD behaviours, Autistic traits and attachment characteristics interact in their relation to the academic self-concept and general self-esteem. The findings of this phase of the doctoral thesis are reported in Section 5 and discussed in Section 6.

Next, the third and final phase of this thesis aimed to qualitatively explore teachers' perception and management of ADHD behaviours, Autistic traits and certain student attachment characteristics will be conducted to provide further additional insight into why these concepts may relate to the academic self-concept and general self-esteem of students. The findings of this phase of the doctoral thesis are reported in Section 7 and discussed in Section 8. Following the completion of both the second and third (quantitative and qualitative respectively) phases, the findings will be synthesised to form conclusions and outline future

recommendations as reported in Section 9. The discussion elements of the three phases of this doctoral thesis have been separated to be more easily accessible for the reader and to allow independent analysis before being considered in tandem to ascertain conclusions and suggestions for future research.

1.3 Research Questions

1) What are the relations between attachment characteristics, Autistic traits, ADHD behaviours and the academic self-concept and general self-esteem of adolescents in sixth form colleges in the UK?

2) Is there evidence of an interactive or summative effect in the relation between attachment characteristics, Autistic traits and ADHD behaviours to the academic selfconcept and general self-esteem of adolescents in sixth form colleges in the UK?

3) What are teachers' perceptions and reported management styles of ADHD behaviours, social and communication difficulties of Autism and attachment characteristics exhibited by students in the classroom?

1.4 Theoretical/Conceptual Framework

This study will approach the self-concept as a multidimensional construct and utilise Shavelson et al's (1976) and Marsh and Shavelson's (1985) widely accepted multidimensional, hierarchical model of the self-concept. Marsh and Shavelson's (1985) model posits the overall self-concept sits at the apex of the self-concept construct and is relatively stable, whereas domain-specific factors of the self-concept fall below this such as the academic and non-academic self-concepts as lower-order factors. The academic selfconcept is the construction of one's self in an educational or school-based context and forms part of the overall self-concept. The non-academic self-concept is the constructions of one's self in other settings such as peer-relationships or their general self-esteem. The self-concept is formed through feedback and social comparative effects (Bouchey & Harter, 2005; Buhs, 2005; Cole et al., 1997; Marsh & Hau, 2004) and outlines three specific routes in which selfconcept can be influenced. These are the "Big-Fish-Little-Pond Effect" (Marsh, 1987), the reciprocal effects model (Marsh & Martin, 2011) and the frames of reference models (Marsh, 1986a; Marsh & Yeung, 2001), all of which have implications for the role of ADHD behaviours, Autistic traits and attachment characteristics in the classroom and the formation of the academic self-concept and general self-esteem.

The "Big-Fish-Little-Pond Effect" (Marsh, 1987) demonstrated that students in betterperforming schools had a worse academic self-concept than a student of comparable ability in a lower-performing school. Marsh explains that this was due to social comparative effects whereby students evaluated their performance and ability with reference to those around them. In a better performing school students are more likely to see better-performing peers, which would adversely impact their academic self-concept as they believe they are among the "weakest" in the class/school. The inverse relation holds for worse performing schools. This means that students in a worse performing school are exposed to worse-performing peers which presents as feedback showing that among their peers they (on average) perform better which positively adjusts the academic self-concept.

The reciprocal effects model (Marsh & Martin, 2011) demonstrates that there is mutual feedback between academic success and the academic self-concept whereby success or failure informs the academic self-concept and general self-esteem which in turn informs later performance and so on. This presents a potential relation where students who demonstrate atypical behaviours perform worse in school due to these behaviours, this poor performance may be fed back by adjustments and poor grades and potentially adjusts the academic self-concept and general self-esteem accordingly and feeds into future academic performance and so on. The frames of reference model suggested by Marsh (1986a) and Marsh and Yeung (2001) specifies that students' construction of their academic self-concept is carried out through internal or external frames of reference. Internal frames of reference involve internal processes, with students comparing their ability in one lesson to their ability in another. External frames of reference, in contrast, involve students assessing their capability against the performance of others based on feedback. So, for example, students seeing better grades or more positive feedback from teachers in English classes than mathematics for example would be an internal frame of reference for the construction of the academic self-concept. However, students observing other pupils receiving more positive feedback in English would be an external frame of reference for the construction of the academic self-concept.

Application of the assumptions from the findings of the "Big-Fish-Little-Pond" (Marsh, 1987), frames of reference (Marsh, 1986a; Marsh & Yeung, 2001) and reciprocal effects (Marsh & Martin, 201) research to the scope of this doctoral research requires us to consider how differential student behaviours and classroom contexts tie into this. Different classes present as different contexts upon which behaviours can be judged, and even unique differences, transient factors (such as mood) and tolerances of teachers influence the interpretation of student behaviour and therefore subsequent feedback given to students. This means that each scenario of student behaviour teacher response interactions could all influence the academic self-concept and general self-esteem in some way, perhaps unintentionally in some situations.

1.5 Scope of the Study

This research will cover five important key areas that are fundamentally related to this mixed-methods thesis. These are ADHD, attachment, Autism, the academic self-concept, general self-esteem and educational practice and (school) context. Educational practice and

school context will touch on various subjects, including common management techniques for supporting ADHD, Autism and attachment disturbances in the classroom, current government legislation and teacher training on the consideration and management of student behaviours, and the special educational needs and disabilities (SEND) pathway.

1.6 Significance of the Research

This doctoral research is significant as it is the first project of its kind (to the researcher's awareness) to explore dimensional co-occurring models of ADHD behaviours, Autistic traits and attachment characteristics in relation to the academic self-concept and general self-esteem. Past research has focused heavily on categorical models of these concepts and has applied the medical model and current SEND perspective on consideration of student behaviours. Furthermore, this research is novel in its exploration of teacher perceptions of specific student behaviours as opposed to diagnoses including their approach to the management of these behaviours and the application of this to self-concept theory and the formation of the academic self-concept and general self-esteem. This means that this doctoral research is the first to critically appraise and consider how teacher responses to student behaviours may factor in the academic self-concept and general self-esteem development in students.

1.7 Summary

To summarise, this doctoral thesis will explore the relations between ADHD behaviours, Autistic traits, attachment characteristics and the academic self-concept and general self-esteem of sixth-form college students. It will also provide a qualitative exploration of teacher interpretation and management of ADHD behaviours, Autistic traits and attachment characteristics in the classroom. This qualitative research was conducted to further inform the understanding of how ADHD behaviours, Autistic traits, attachment characteristics relate to the academic self-concept and general self-esteem and the role teachers may play in this relation.

Chapter 2 - Literature Review

2.1 Orientation

The current literature review will cover three key topics that form the theoretical basis for this doctoral research. As the present thesis explores the relations between ADHD behaviours, Autistic traits, attachment characteristics and the academic self-concept and general self-esteem with reference to teacher management and perception of these behaviours there is a need to understand the education system in greater detail, the nuances of Autism, ADHD and attachment and the academic self-concept and general self-esteem. Therefore, to begin there will be a focus on the English education system (Section 2.2) and the conceptualisation and management of student behaviour in the classroom regarding inclusion, neurodiversity and special educational need. The introductory focus on the English education system and practice will orient the reader to the context that underpins the relations between ADHD behaviours, autistic traits, attachment characteristics and the academic self-concept and general self-esteem. Secondly, focus will move to the diversity of student behaviour in the classroom (Section 2.3) explicitly focusing on ADHD behaviours, Autistic traits and attachment characteristics. The ways in which these concepts are understood in the thesis will be outlined in greater detail, in addition to the ways they may impact academic functioning and common interventions teachers can utilise to manage these behaviours. Thirdly, the selfconcept will be introduced (Section 2.4) which will outline the structure of the self-concept, its formation, the implications the academic self-concept and general self-esteem has for both academic functioning and the role teachers have in the student self-concept.

2.2 The English Education System and the Conceptualisation and Management of Student Behaviour

The concept behind the current education system in England was developed in the 19th century as universal education for all children, free at the point of use. The English

education system is relatively standardised, assessment-focused and spans 14 years of an individual's life from the age of 4 to 18. That is to say, students learn roughly the same topics at the same time and sit the same exams at the same periods. For example, all children will study English from 4 to 16 and will study the same topics during this period and be examined on those topics at key points, such as at age 16. However, despite education in the UK being fairly standardised in delivery, it takes place across numerous institutions such as primary and secondary schools and sixth-form colleges. The change between institutions does not amount to drastic changes in the method in which education is delivered. For example, despite certain ages of students being educated in primary schools and other ages educated in secondary schools all students will be educated in a classroom with a teacher and some form of visual aid or whiteboard, simultaneously completing tasks relevant to the topic.

The actual method in which the education system is implemented in society, such as classrooms and schools, has changed little from its initial conception and demonstrates little deviation across multiple countries and cultures. Indeed, Watkins (2012) outlined that in images of classrooms from the past there is a recurrence of similar room layouts, uniformity of student treatment, perceptions of disruptive student behaviour and a view of teaching as instruction and learning as listening and response to name but a few. Furthermore, research by Cuban (1993), Nunley (2011) and Hiebert et al. (2003) also demonstrated that the classroom is consistent throughout time and across cultures with Nunley (2011) even comparing the classroom to a "historical museum". The aims of the English education system, and indeed possibly all education systems, has been debated but can generally be conceptualised as having one of five objectives. These objectives range from the education of specific academic subjects such as mathematics, nurturing of the child's best interests, instilling previous knowledge, developing prosocial traits and the creation of a future workforce (Bennett, 2017). To meet these goals lessons are delivered in schools according to

the requirements of the national curriculum such as the education of subjects such as English and mathematics with assessments occurring from reception upwards (Department for Education, 2014).

Despite the criticisms of the English education system as relatively antiquated in structure, it is extremely efficient. Indeed, millions of children progress through the system every year leaving with necessary qualifications and life skills for the future. In 2019 there were approximately 12 million individuals aged 5-19 in the UK (Statista, 2020); of those 12 million individuals, those under the age of 18 were in education, and those who were under 16 were required to be educated according to the requirements of the national curriculum. For example, the teaching of specific subjects such as mathematics or English, with key topics covered and assessed later. It would be difficult to argue that a more efficient way of educating these individuals exists than through the school and classroom-based approach.

However, school and classroom-based approaches have their limitations. One such limitation is the relative inflexibility the school and classroom-based approach to the understanding and management of student diversity on a behavioural and psychological level. Indeed, in order to successfully educate large classes of children and adolescents, teachers need relative order and compliant, non-disruptive behaviour. Bennett (2017) extols the virtues of good, compliant behaviour in the classroom linking this to a better realisation of the outcomes of education, in addition to increased staff well-being and retention. However, in a classroom of up to 30 children in primary schools and potentially more in secondary (Department for Education, 2011; The Teachers Union; NASUWT, n.d.), this can be difficult, indeed research has even suggested that "poor" behaviour is endemic in UK classrooms. Poor behaviour in classrooms has been defined as externalised and/or disruptive behaviour (Hinshaw, 1992; Infantino & Little, 2005) which poses a threat to classroom order. Indeed, Bennett (2017) also cites externalised and disruptive behaviour as examples "of poor behaviour". A report by the Office for Standards in Education, Children's Services and Skills (OFSTED, 2014) posited that low-level disruption and therefore, poor behaviour, was far too prevalent in classrooms. The Below the Radar report (OFSTED, 2014) found that in surveys of teachers and parents, low-level disruption was categorised as talking, calling out, fiddling with things, not listening, shouting out and using mobiles to name but a few examples. However, this notion of "good" and "bad" behaviour needs to be questioned further, as Bennett (2017) also pointed out. Good behaviour is not simply just the absence of bad behaviour, but it is also more desirable behaviours such as good study skills (Bennett, 2017). However, Bennett (2017) failed to acknowledge that the concepts of these behaviours and the notion of their "positivity" or "negativity" is informed by the context and implicit cues and expectations of that context, therefore leading to a failure to question the education system. Indeed, it is difficult not to behave in a potentially bad way when there are only so many behaviours that are considered "good". Despite this, Bennett (2017) did acknowledge the question of whether directing students to behave in a certain way is oppressive, explaining that in his opinion it was not and the direction of behaviour by teachers helped develop selfregulation strategies and other necessary skills. While there is a need to instil positive and compliant behaviours and characteristics in children and adolescents, this does still implicitly send a message of adjusting students to fit contexts rather than adjusting contexts to meet the behavioural and psychological diversity present in a student population.

This reliance on students meeting the assumptions and expectations of the classroom, however, can result in an insensitivity to neurodiversity in pupil cohorts (Griffin & Pollak, 2009; Kauffman & Badar, 2018). Neurodiversity is a term that has its origins in a reframing of Autism (Singer, 1999). Then expanded to incorporate a range of learning difficulties and finally is now suggested to include everyone (Armstrong, 2012; Griffiths, 2020). The principles of the neurodiversity movement posit that there are neurological or physiological differences among and between the human population that contribute to differences in functioning, both positive and negative, leading to individuals being unique and "differentlyabled" (Austin & Pisano, 2017). These differences are evidence of natural variation in the human species and should be accommodated and celebrated (Austin & Pisano, 2017; Jaarsma & Wellin, 2011). It is unrealistic to assume that all students will engage, behave and perform in the same way; although simultaneously it is not feasible to educate every student on a oneto-one, personalised basis. Therefore, in practice, schools tend to group students that are relatively similar together, such as in ability groups (Robinson, 2010) or age. However, this may also include students with neurodiverse needs who struggle to function in the classroom context. Indeed, it is commonplace for students with special educational needs (SEN) or disabilities to be present in mainstream education, in line with the principles of inclusive education (Department for Education & Department for Health, 2015). Inclusion principles posit that education should be accessible by both disabled and non-disabled individuals with adaptations and support from the system to include these individuals until such a point that it is not feasible to include individuals in mainstream education (Polat, 2011; Qvortrup & Qvortrup, 2018). For example, when the level of disability or difficulty is to such an extent that it is not possible to meet the individual's needs in mainstream education, even with adjustments and support. Inclusive education is underpinned throughout teaching and educational legislation; indeed, teachers have an obligation to support students to succeed in class as stipulated in the Teachers' Standards (Department for Education, 2013). The initial teacher training (ITT) core content framework (Department for Education, 2019) lays out eight standards that must be met during teacher training to take forward into professional practice. These include setting high expectations, promoting good progress and outcomes, demonstrating good subject and curriculum knowledge, planning and teaching effectively, adaptive teaching, accurate and productive assessments, effective behaviour management and
fulfilling wider responsibilities. Of these eight standards, Teachers' Standard five, which is adaptive teaching, is explicitly defined as the appropriate differentiation in teaching, overcoming barriers to students' learning and finally supporting students' needs at different stages of development with and without additional needs.

Naturally, due to the close relationship between adaptive teaching and inclusive education principles, there is a heavy emphasis (although not exclusive) on adapting learning for students with special educational needs and/or disabilities (SEND). Thereby insinuating that adaptive teaching is only needed for those who are SEND despite adaptive teaching being potentially beneficial to all students regardless of disability or need. Indeed, the ITT core content framework (Department for Education, 2019) explicitly states that adaptive teaching can be done through collaborative working with Special Educational Needs Coordinators (SENCOs) in schools and consultation of the Special Educational Needs and Disabilities (SEND) Code of Practice (Department for Education & Department for Health, 2015). Reference to collaborative working with SENCOs seems to implicitly suggest that if adaptive teaching is required it is because the child has some form of SEND consideration. The SEND Code of Practice (Department for Education & Department for Health, 2015) states that a child or young person has a special educational need "if they have a learning difficulty or disability which calls for special educational provision to be made..." (p. 15) and stipulates that for the conceptualisation of a special educational need a learning difficulty or disability is "a significantly greater difficulty in learning than the majority of others of the same age" (p. 16) or "a disability which prevents or hinders him or her from making use of facilities of a kind generally provided for others of the same age in mainstream schools" (p. 16). Adaptive teaching, however, does seem to work in improving academic outcomes for children. A systematic review of 299 studies from 2007-2017 spanning Australia, the United States and Europe demonstrated that student-centred instruction has a moderate, positive

effect on achievement. Furthermore, special education students perform significantly better with adaptive teaching than the general population (Bernard et al., 2019). Adjustments made by teachers adapting teaching can be formal or informal in nature, with informal adjustments being routine changes a teacher might make to the delivery of a lesson, for example, reducing activity times to maintain focus. Formal adjustments in provision are documented in either an individualised educational plan (IEP) or an education, health and care plan (EHCP). Formal adjustments made in an IEP or EHCP may include dedicated time to develop language skills or specific times with learning support assistants during the day.

The EHCP is organised by the local authority and is much more comprehensive than an IEP, with an EHCP involving elements of health and social care and, if appropriate, a personal budget (Department for Education & Department for Health, 2015). An IEP is created and managed by school staff and is focused purely on academic functioning, therefore an IEP does not usually come with a budget for student support unless the school explicitly sets aside funding for the plan. Anyone experiencing difficulties in education can receive an IEP, whereas an EHCP usually requires objective evidence of disability such as a diagnosis of a recognised SEN. The use of IEPs and EHCPs are mechanisms to support students through tailoring of learning in the classroom. Past research has presented conflicting findings both supporting and rejecting IEPs and EHCPs in supporting students. For example, research by Barnard-Brak and Lechtenberger (2010) found that disabled student participation in IEPs was positively associated with increased positive academic achievement in reading and math. Furthermore, a review of research on IEPs by Blackwell and Rossetti (2014) complimented the findings of Barnard-Brak and Lechtenberger's (2010) research finding that participation of students in the IEP process was an effective strategy for improving selfdetermination skills such as increased engagement in academia and the development of their IEPs. Therefore, IEPs seem to be useful methods of supporting students with disabilities.

However, EHCPs have been critiqued and evaluated much more recently due to their more recent introduction into the education system in the 2015 SEND Code of Practice (Department for Education & Department for Health, 2015) in which "Statements of Special Educational Need (SEN)" were changed to EHCPs. The change from Statements to EHCPs was designed to address criticisms of the Statement process which included age limitations, lack of emphasis on multi-agency working and lack of consistency in legislation interpretation across local authorities leading to inconsistent care (Sales & Vincent, 2018). However, research has shown that EHCPs have not successfully addressed all of these limitations, namely issues regarding consistency of care and accessibility of support for students. Indeed, interviews conducted by Sales and Vincent (2018) on families and education professionals have identified that in their experiences the outcomes of the EHCP referral process did not necessarily reflect the needs of the child but were also influenced by other factors such as the funding of provision and the ability of the parent to advocate for the child. Other research has also highlighted the lack of funding and resources as a clear barrier to the implementation of EHCPs to support children in school. Indeed, in interviews with SENCOs carried out by Boesley and Crane (2018) a major theme identified was that of decreased funding for SEN which led to local authorities reducing the number of applications for EHCPs with an emphasis on alternative support. Nevertheless, although there still appears to be issues with provision for students with additional considerations even with a movement away from Statements, it is important to also emphasise the positive aspects of EHCPs. In the interviews conducted by Sales and Vincent (2018) all of the interviewees found the specified outcomes in the EHCPs made for better documents and the involvement of parental and child opinion and views were extremely valuable. The research by Boesley and Crane (2018) concurred with this, with the SENCOs interviewed expressing support for the principles behind the system and noting that the EHCP system had potential. Thus, the introduction of

EHCPs as an alternative to Statements of SEN seems to have addressed some of the criticisms of the former Statement process. Overall, the IEP and EHCP system appear to be positive strategies for supporting students with additional considerations in education, though these are not without their criticisms.

Although the EHCP and IEP processes seem to present suitable ways of supporting students in education, these elements of adaptive teaching are not always easily implemented or systemically supported. In research by Woodcock and Woolfson (2019) using data from multiple countries, they found that the consistent major barriers to appropriately supporting students in the classroom were budget limitations and the constraints of attempting to support many students at once. These findings echo similar results shown in research across the Commonwealth with the work of Round et al. (2016) demonstrating that Australian teachers believed that schools were inappropriately and inadequately resourced to allow inclusion. This perception was also echoed in the work of Boesley and Crane (2018) in the UK education system where themes found in interviews of SENCOs were of decreased funding for SEN to support children in education. Furthermore, the difficulties of catering for all students in the class has also been previously referenced in research by Anderson et al. (2007) where it was suggested that teachers are essentially spinning plates, trying to cater for the needs of many diverse individuals and support inclusion, while also spending the appropriate amount of time with all children and meet the requirements of the curriculum.

Problems in the implementation of inclusive practice and principles in the classroom are not the only problems with the current SEND model. Research has demonstrated that in some instances forced inclusion in mainstream education can lead students to develop a worse perception of themselves and their abilities (Marcum & Pond, 2007; Perifanou, 2020). This is likely due to the focus on perceived problems and deficits of students rather than the potentially disabling nature of the environments. Indeed, as Harry and Klinger (2007)

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suggested, problems exhibited by children and young adults in school functioning lead educators/teachers to automatically question "what is wrong with the child?". Kirby (2017) argues that the deficit model of disability in education comes from wider society and the medical model, whereby the disability is a flaw that SEND resourcing seeks to remedy. To some extent, this is a valid position, as the medical model of conceptualising and understanding human behaviour considers pathological behaviour to hinder, deviate from or adversely impact "normal" functioning or cause distress to the individual (see American Psychiatric Association, 2013). Indeed, this is the crux of the matter: difficulties in education are often seen as pathology rather than an example of human variation (Reid & Weatherly Valle, 2004) and are usually identified by the inability of the child to exhibit the "normal" behaviour that would be expected in the educational context (Department for Education & Department for Health, 2015). That is not to say however that there are not cases where difficulties in education are a result of pathology, quite the opposite, rather that the definitions of SEND and the broadness of the medical model can sometimes conceptualise more diverse student behaviours as pathological. This is just because they deviate from "normal" functioning which is interpreted by wider contextual and social cues (see American Psychiatric Association, 2013) and as such is open to errors in interpretation. Therefore, the SEND Code of Practice (Department for Education & Department for Health, 2015) is a contrast to the concept of neurodiversity, which posits that there is both positive and negative natural deviation in human behaviour due to neurological or physiological differences. However, these differences are part of the human experience and not necessarily just to be pathologised but supported and celebrated.

In recent years there has been a move towards a neurodiverse model of understanding and supporting student behaviour (see Armstrong 2012a; Armstrong, 2012b; Armstrong, 2015; Armstrong, 2017; Griffiths, 2020). The adoption of a neurodiverse approach to understanding and supporting student behaviour places an emphasis on the recognition of the strengths of those with disabilities and how contexts may disable individuals. It is possible to see how the education system may disable individuals due to the strict demands it places on desirable behaviour and the way the current SEND system works to overcome this is to remedy those deficits in the individual. Whereas Armstrong (2017) posits that a neurodiverse approach instead focuses on changing environments so that all students can succeed. This has been referred to in past literature as a "universal design for learning" (UDL). The notion of a UDL is not new and has been discussed consistently across the years. Generally speaking, research is in favour of a UDL in modern classrooms with a meta-analysis by Capp (2017) demonstrating that UDL is an effective teaching method that improves the learning process for all students, both disabled and non-disabled.

However, implementing neurodiverse strategies in supporting SEND behaviour or a UDL is not without its challenges. Indeed, some barriers to the movement towards this model are evident. One apparent barrier is the fear that by focusing on the strengths of a student with special needs, the focus moves from supporting the weaknesses they may have, which then poses the question about why these students may even need support (Armstrong, 2017). Another barrier is the concern the removal of the remediating process in addressing student difficulties may cause. The removal of this support may lead to students failing to meet the academic demands expected of them (Armstrong, 2017). However, both Armstrong (2017) and Harry and Klinger (2007) explain that there is a role for formal categorisation of disability in education, but that more emphasis should be placed on the students' strengths and supporting behaviours such as poor emotional regulation or inattention with less focus on the deficits associated with diagnosis and disability. According to Harry and Klinger (2007), a clear diagnosis of a disability should only be relevant in education in so far as to receive specialist, specific interventions such as the Orton-Gillingham approach to dyslexia for

example (Sayeski et al., 2019). For the many students who may have difficulties but no diagnosis then support should be tailored based on level of achievement. Armstrong (2017) concurs with this, explaining that optimising the label of disability to access specialist services while discarding the mindset to adopt a strengths-based, positive focus. Armstrong (2017) explained that this could easily be done through adjustment of IEPs by reframing objectives to include strengths such as tailoring objectives to tie in a student's interest. This would therefore enable the student to recognise more of their strengths and work through challenges by capitalising on their strengths rather than by focusing on supporting their weaknesses.

To conclude, the practices and methods by which teachers support students in the classroom are limited by the demands placed on them by both the classroom structure which is, in turn, informed by the function of education and government policy in England (see Department for Education, 2013, 2014, 2019; Department for Education & Department for Health, 2015). Government policy, in turn, is one influential factor in how teachers respond to and interpret student behaviour. This leads teachers down a path of pathologising behaviour that is atypical in the classroom and therefore is considered to deviate from "normal" functioning and be interpreted as indicative of SEND (see American Psychiatric Association, 2013; Department for Education & Department for Health, 2015). In situations such as this, teachers are expected to adapt their teaching to support the student (Department for Education, 2013). However, adaptive teaching as a concept is largely related to SEND in education (Department for Education, 2013; see also Department for Education & Department for Health, 2015), which in turn focuses on deficits within the individual that require remediating or supporting. The problem with using this model to conceptualise student behaviour is that it is weakness based and focuses on "fixing" the child to succeed (Armstrong, 2017; Harry & Klinger, 2007; Kirby, 2017). However, alternatives do exist

which are more empowering to the individual, such as a neurodiverse approach to the conceptualisation of student behaviour, as posited by Armstrong (2017). A neurodiverse approach capitalises on the strengths of all students, positing that we are all differently able and that environments should be altered to capitalise on this and support students to succeed, rather than adjusting the student to succeed by adapting them to the environment.

2.3 Student Psychological Diversity in Education

In section 2.1, the educational and classroom context was introduced to provide an insight into the context in which student behaviours are interpreted and how diverse behaviour is included and supported in the classroom. Insight from relevant research and educational policy paints a picture of a system that is limited and restrictive due to a number of factors, which unintentionally can make it exclusive (Axup & Gersch, 2008; Bennett, 2017; Margot & Kettler, 2019; Williams & Grayson, 2018). However, this is acknowledged, and strategies are in place to attempt to include students in the classroom. These strategies often focus on remedying these within the student without instead attempting to make the environment more inclusive. This, however, also means that in the classroom there is a percentage of children who are "atypical" in behavioural manifestation and may even be considered to be SEND in some cases. Specific, common difficulties children may present with in the classroom include Autistic traits, ADHD behaviours and attachment characteristics and present some elements of diversity in student behaviours. These may include, inattention, difficulties in interaction and communication, impulsivity and poor peer relationships. Therefore, the present section will consider ADHD behaviours, Autistic traits and attachment characteristics and the implications these have for academic functioning and how they are managed in lessons by teachers. This will be split into three parts. Section 2.3.1 will introduce ADHD behaviour, its relationship to academic functioning and the ways in which it is managed by teachers. Section 2.3.2 will introduce the concept of Autistic traits,

the relationship it has with academic functioning and finally, Section 2.3.3 will introduce the concept of attachment characteristics, how they relate to academic functioning and how they are managed in the classroom.

2.3.1 Attention Deficit Hyperactivity Disorder and Associated Behaviours

ADHD is a neurodevelopmental disorder characterised by symptoms of inattention, hyperactivity and impulsivity (American Psychiatric Association, 2013). However, inattention, hyperactivity and impulsivity are behaviours that we are all capable of demonstrating and are only considered to be symptomatic of ADHD when they are so severe that many aspects of functioning are adversely impacted. For example, academic, social and occupational functioning may all be impacted (American Psychiatric Association, 2013). The behaviours associated with ADHD can pose a stark contrast to the requirements of the classroom; hyperactivity, impulsivity and inattention are contrary to highly structured, ordered contexts that demand prolonged attention and often sedentary behaviour (Azrin et al., 2007). Therefore, the ways in which the behaviours associated with ADHD are adversely related to academic functioning, the management of ADHD behaviours and the efficacy of ADHD management techniques will be considered.

Research has indicated that the core symptoms of ADHD present as dimensional constructs as they only differ from normality by degree not by kind. That is to say, the behaviours that form symptoms of ADHD are only abnormal because they are extreme manifestations of normal behaviour (Coghill & Sonuga-Barke, 2012). This dimensional model also forms part of the American Psychiatric Association's (2013) classification of ADHD in the DSM-V with the assessment of ADHD requiring stipulation on the severity of symptoms from mild to severe. For this reason, the symptoms of ADHD are best thought of

as the extreme end of a continuum of behaviour from "normality" to disorder (McLennan, 2016).

The behaviours associated with ADHD adversely impact an individual's functioning, with academic functioning such as exam performance and school conduct being one of the most commonly and severely impacted domains of functioning. The Diagnostic and Statistical Manual of Mental Health Disorders (DSM-V) state that for a diagnosis of ADHD "a persistent pattern of inattention and/or hyperactivity-impulsivity" is required "that interferes with functioning or development" (American Psychiatric Association, 2013 pp. 59-61). Six (or more) symptoms of inattentive and hyperactive-impulse behaviour are required which have persisted for at least six months and are inconsistent with the person's developmental level. Table 1 outlines some of the suggested symptoms according to the DSM-V criteria.

Table 1.

Inattentive and Hyperactive-Impulse Symptoms Required for the Diagnosis of ADHD Displayed According to the DSM-V Criteria

	Inattention	Hyperactive-Impulse
• Oft	en fails to give close attention to •	• Often fidgets with or taps hands/feet
deta	ails or makes careless mistakes	or squirms in seat
in s	choolwork, at work	
• Oft	en has trouble sustaining •	• Often leaves seat in situations where
atte	ention on tasks or play	one is expected to remain seated
• Oft	en does not seem to listen when •	Often runs or climbs in situations
spo	ken to directly	where it is not appropriate. Adults or

	adolescents may instead refer to
	feeling restless
• Often does not follow through on	• Often unable to play or engage in
instructions and fails to finish	leisure activities quietly
tasks/schoolwork	
• Often has trouble with organisation	• Is often "on the go" acting as if they
	are "driven by a motor"
• Often avoids, dislikes or is	Often speaks excessively
reluctant to do tasks that require	
sustained mental effort	

Hyperactive and impulsive behaviour found in ADHD are some of the more problematic behaviours in the classroom. However, not all children demonstrate these behaviours or extreme levels of them and, as such, ADHD is highly heterogenous (Karalunas & Nigg, 2019; Sibley et al., 2012). For example, research has demonstrated that boys with ADHD are more likely than girls to rule-break and exhibit externalised behaviour, such as hyperactive and impulsive behaviours (Abikoff et al., 2002). Girls exhibiting more neutral behaviour like inattention and fidgetiness draws less attention from adults and can therefore be missed, leading to a delay in detection of problems (Abikoff et al., 2002). Understandably, neutral manifestations of ADHD behaviours may be missed by teachers due to the number of children in a classroom cohort and the need to divide attention between them all.

The work by Jangmo et al. (2019), Saval et al. (2015), Wood et al. (2019), and others all demonstrate that the presence of ADHD behaviours is associated with impacted academic functioning and adverse outcomes. These include worse exam performance (Ek et al., 2011), poor academic motivation (Smith et al., 2020) and worse academic performance as measured

by grade retention, school completion and attendance (Arnold et al., 2015). The difficulties in academic functioning found in those individuals with ADHD behaviour are prevalent across their academic career. Indeed, longitudinal research has highlighted that the presence of ADHD symptoms in seven-year-old English children with ADHD predicted worse academic outcomes at age 16. ADHD symptoms were measured through the parent and teacher reports of the development and well-being assessment (DAWBA). Overall, the presence of ADHD symptoms was found to be correlated with a 27-to-32-point reduction in the summed total of the best eight GCSE scores obtained. Each one-point increase in an inattentive scale of 0-20 at age seven predicted a two-to-three-point reduction in the scores from eight different subjects' GCSE exams n GCSE scores at age 16 (Sayal et al., 2015). Further evidence of the adverse impact of ADHD behaviours on academic functioning can be seen in the research by Kent et al. (2011). In a comparative study between 326 American adolescent males with ADHD and 213 without ADHD, it was found that grade point averages (GPAs) were lower in the sample of males with ADHD who also demonstrated higher rates of course failure and more frequent placement in remedial classes (Kent et al., 2011). Later research by Jangmo et al. (2019) similarly found that in Swedish secondary school students a diagnosis of ADHD was associated with lower school performance. This was measured by the sum of grades and eligibility for entry to upper secondary school (USS) which requires a level of academic ability, ineligibility for USS instead leads to students going to other vocational training. The association demonstrated between ADHD and lower school performance in Jangmo et al.'s (2019) research was found independent of potential confounding socioeconomic factors. Without support for ADHD behaviours in the classroom, it is clear that academic outcomes for children who demonstrate them are at risk of being compromised, which in turn can adversely affect their life chances as lower levels of qualifications are linked to poverty (Department for Work and Pensions, 2021). Therefore, there is a clear need to provide

additional support to children who demonstrate problematic levels of these behaviours in the classroom in order for them to perform better academically and be less impacted by their problematic behaviours.

Regardless of the impact of ADHD on academic functioning, there is contradictory evidence as to whether diagnosed ADHD behaviours or undiagnosed ADHD behaviours are more problematic to academic functioning. This could be because ADHD behaviours without a diagnosis may be less severe so as not to warrant a diagnosis or the behaviours may have been missed by a practitioner. Indeed, diagnosed ADHD behaviours indicate that the ADHD symptoms were of sufficient severity or impact to warrant a diagnosis (American Psychiatric Association, 2013; Primich & Lennaco, 2012). Undiagnosed ADHD implicitly suggests that the symptoms have either been missed or they are not at the required severity for diagnosis. Indeed, Wood et al. (2019) found that individuals diagnosed with ADHD reported worse academic and general functioning, than individuals with undiagnosed ADHD symptoms. However, contradictory research by Able et al. (2007) found the inverse of Wood et al.'s (2019) findings, with undiagnosed ADHD associated with lower educational attainment and greater functional impairment such as problems with emotional dysregulation, substance abuse, and interpersonal difficulties than in those with diagnosed ADHD. This may be because the "undiagnosed" behaviours are not entitled to the same level of support which diagnosed ADHD behaviours would be, which could explain why there is a greater experienced impairment.

Academic support for ADHD behaviours usually takes the form of behavioural interventions and adjustment in the class. Classroom-based behavioural interventions for ADHD can be either antecedent-based or consequence-based. Antecedent-based interventions attempt to prevent inattention or disruption from occurring. This could be done by the reduction of the length of tasks to match the students' attention span or greater use of praise for following rules (DuPaul et al., 2011; DuPaul & Stoner, 2014). Consequence-based interventions rely on behavioural and conditioning principles in which perceived positive behaviours are rewarded and negative behaviour is punished. However, the emphasis is placed on positive reinforcement of desirable behaviours as opposed to punishment of undesirable behaviours (DuPaul et al., 2011; DuPaul & Stoner, 2014; DuPaul & Weyandt, 2006). The overall consensus in research is that classroom interventions are suitable management strategies for ADHD. In a review of 176 studies on the long-term effects of ADHD, non-pharmacological treatment was found to account for 75% of improvement in test scores and 50% of improvements in academic performance (Arnold et al., 2015). In further research, classroom interventions have been shown to be effective in a sample of 90 children aged 6-12 with differing levels of ADHD symptoms. Both antecedent and consequence-based interventions were found to be equally and significantly effective in reducing ADHD behaviours in the classroom when compared against a control group. However, younger children responded better to consequence-based interventions and older children responded better to antecedent-based interventions (Staff et al., 2021). Furthermore, in two separate case studies, antecedent interventions, contingency management and positive consequence-based interventions were found to lead to improved student behaviour with reductions in off-task behaviour and improvements in class performance (Flood & Wilder, 2002; Pantaleon, 2016). Therefore, with support, ADHD behaviours in children can be managed and the impact of them in the classroom can improve a student's academic performance.

To conclude, ADHD behaviours can manifest on a continuum with ADHD as a condition representing severe hyperactivity, impulsivity and inattention (American Psychiatric Association, 2013). These behaviours both diagnosed and undiagnosed are associated with poor academic functioning which ranges from poor academic motivation (Smith et al., 2020) to poor exam performance (Ek et al., 2011) and poor academic performance such as non-completion of school education, attendance problems and failure to retain good grades (Arnold et al., 2015). However, despite this, interventions do exist to support individuals with both ADHD as a condition or those who demonstrate ADHD behaviours. These interventions are reasonable adjustments given to students who demonstrate ADHD behaviours in class and have been demonstrated to be effective in the management of ADHD behaviours (Arnold et al., 2015; Flood & Wilder, 2002; Pantaleon, 2016; Staff et al., 2021). Overall, it is apparent that the presence of ADHD behaviours whether diagnosed or not are adversely impactful in education without intervention from teachers in their management of them in the classroom and due to the link that poor academic performance has with life trajectory including poverty and employment (Department for Work and Pensions, 2021) it is important that these behaviours are appropriately managed in the classroom, so students have the best possible start to adult life.

2.3.2 Autism Spectrum Disorder and Autistic Traits

Autistic traits form part of Autism Spectrum Disorder (ASD) which is a neurodevelopmental disorder like ADHD. Autism is characterised by deficits in communication and social interaction and stereotypic/rigidity of behaviour (American Psychiatric Association, 2013). Like ADHD behaviours, the presence of Autistic traits has been associated with poor academic functioning (Hughes et al., 2021; Keen et al., 2016; Levy & Perry, 2011; Mayes et al., 2019). The manifestation of Autistic traits in individuals form a "taxon" unlike ADHD, where the core traits can appropriately be captured by a discrete entity (Coghill & Sonuga-Barke, 2012; Frazier et al., 2010). This means that they also deviate from "normal" behaviour because they are fundamentally different by nature. However, as with ADHD, the behaviours associated with Autism are also shown to fall on a continuum within the taxon, where they differ by degree between individuals (Coghill & Sonuga-Barke, 2012) with some Autistic individuals experiencing substantially less/more detriment than others. To understand the impact of Autistic traits in education and how it is managed, this section will consider further how Autism is conceptualised and understood, how it relates to academic functioning, how it is managed in education and the efficacy of interventions for Autistic traits in improving academic functioning.

This diversity in the manifestation of Autism is an example of the heterogeneity within Autism (Georgiades et al., 2013), which informs the referral to Autism as a "spectrum" condition. The acceptance of a spectrum model of Autism has reframed the condition from an 'illness' or 'disease' (NHS, 2019), to now instead be an example of human neurodiversity (Graby, 2015). Although Autism is now recognised as an example of neurodiversity, severe levels of Autistic traits that demonstrate a significant impact on functioning are still managed medically in order to allow access to support such as specialist interventions. These may take the form of reasonable adjustments or communication skills training to mitigate the impact of some of the difficulties associated with Autism. As was the case with the diagnosis of ADHD (referenced in Section 2.3.1), the assessment of Autistic behaviours focuses on symptoms in consideration of context and deficit experienced. To receive a diagnosis of ASD the DSM-V (American Psychiatric Association, 2013) stipulates that a child must have persistent difficulties across multiple contexts in each of the three areas of social communication and interaction issues and at least two of the four types of restricted, repetitive behaviours. These difficulties must cause clinically significant impairment in social, occupational or other important areas of current functioning with the severity of the symptoms manifesting specified. Suggested symptoms from the DSM-V which are used for the diagnosis of ASD can be found in Table 2.

Table 2.

Social Interaction and Communication Difficulties and Restricted, Repetitive Behaviour Symptoms Required for the Diagnosis of Autism Spectrum Disorder Displayed According to the DSM-V Criteria

Deficits in Social Interaction and	Restricted, Repetitive Behaviours
Communication	
Deficits in social-emotional reciprocity	Stereotypes or repetitive motor movements,
	use of objects or speech
Deficits in nonverbal communicative	Insistence on sameness, inflexible
behaviours used for social interaction	adherence to routines, or ritualised patterns
	of verbal or nonverbal behaviour
Deficits in developing, maintaining and	Highly restricted, fixated interests that are
understanding relationships	abnormal in intensity or focus
	Hyper- or hypo- reactivity to sensory input
	or unusual interest in sensory aspects of the
	environment

In the fifth edition of the DSM, Autism Spectrum Disorder is differentiated into three levels depending upon the severity of the traits the individuals may manifest with a score from one to three given to the social and communication and restricted and repetitive behaviour domains (American Psychiatric Association, 2013). A score of one represents a relatively small level of impact with minimal support required whereas level three represents a severe manifestation of Autistic traits and substantial support. Those individuals who are severely impacted with scores of three on both domains tend to also show lower intelligence scores and younger age (Mazurek et al., 2019) and therefore tend to be representative of a relatively "low-functioning" manifestation of Autism. However, those individuals who have minimal manifestations of Autistic traits (a score of one) in both the social and communication and restricted and repetitive behaviour domains can be said to be "highfunctioning". The introduction of severity levels into the DSM (American Psychiatric Association, 2013) presents a move towards consideration of Autism as a dimensional concept as opposed to the categorical model usually found in clinical practice, and therefore the notion of a continuum of deficit.

Autism has generally been differentiated into high and low functioning due to the heterogeneity in which it can manifest in individuals. Low-functioning Autistic individuals demonstrate more difficulties with their Autistic traits and potential co-occurring intellectual impairment (Mazurek et al., 2019) that leads to relatively low levels of functioning such as in school and therefore greater required support. High-functioning Autistic individuals are the contrary of this, functioning fairly well with minimal or no required support. However, both high and low-functioning forms of Autism have been implicated in poor academic functioning. Indeed, academic outcomes such as the satisfactory completion of education, absence and attainment, in particular, have generally been shown to be poor (Hughes et al., 2021; Keen et al., 2016; Levy & Perry, 2011).

Autistic traits, regardless of whether the individual is high or low functioning, can be problematic in the classroom. Indeed, Sahin et al. (2018) outlined that Autistic social interaction and communication issues in children are the primary deficit experienced in classrooms. Interaction and communication deficits can cause a substantial impact in the classroom due to the need for communication and interaction integrated into learning and lessons (Sutton et al., 2019). In addition to this, research has demonstrated that in individuals with high functioning Autism there are issues with low processing speed, visual perception, recognition and coordination (Kanai et al., 2017). Furthermore, in a sample of young adults (M = 22.5 years) in higher education, Autistic traits and worse executive functioning abilities, such as graphomotor and processing speed were negatively correlated with academic progress. Furthermore, Autistic traits explained 12% of the variance in academic progress

which increased to 36% when adding self-reported daily executive functioning scores (Dijkhuis et al., 2020).

Despite the adverse relation between Autistic traits and academic functioning, high functioning individuals with few or less severe traits of autism can function perfectly adequately in the mainstream education system in the UK, with support for some traits and without support for others (Estes et al., 2011). Research by Richardson (2017) highlighted this further demonstrating that adult, Autistic individuals with no additional disabilities were just as likely as non-disabled students to successfully complete Open University distancelearning courses and pass them with a good grade. Furthermore, mixed methods research by Dillon et al. (2016) highlighted that there was no significant difference between ASD students and controls on self-reported measures of social skills, teacher-pupil relationships, school functioning and interpersonal strengths.

The support needed for individuals with Autistic traits to function well in mainstream education depends on the particular needs of the individual. Dillon et al.'s (2016) work highlighted that Autistic individuals need a positive, caring relationship with helpful school staff in order to feel comfortable and supported. However, teachers and school systems often struggle to support Autistic individuals in mainstream education. This is due to a difficulty in managing students with additional needs in a classroom of many other students (Morewood et al., 2011). For example, students with Autistic traits tend to show uneven skill profiles (Fleury et al., 2014) with some individuals exhibiting academic abilities far beyond their neurotypical peers (Howlin et al., 2009), while also struggling with other cognitive elements such as working memory and processing speed difficulties (Nyrenius & Billstedt, 2020). Therefore, finding the time and resources to adapt to varied needs in the classroom may be difficult when different strategies and materials could be required. Thus, difficulty in

supporting individuals with Autistic traits in the classroom is a potential reason why individuals with Autistic traits struggle to perform well in mainstream education.

As with the support for ADHD behaviours, support for individuals who demonstrate Autistic traits in school take the form of reasonable adjustments and behavioural interventions to facilitate better functioning and are designed to support individuals with Autistic traits in the classroom with a focus on inclusion, support and symptom management (Koegel et al., 2012). The majority of the school-based interventions for the management of Autism focus on the training and improvement of social and communication skills. This is possibly due to the commonality and impact of these problems in individuals with Autistic traits (Sahin et al., 2018) and the fact that interaction and communication difficulties are the most likely to inhibit classroom functioning (Sutton et al., 2018). Social based school interventions such as "social adjustment curriculums" and CBT-based interventions are effective in improving social-academic functioning (Koning et al., 2013; Solomon et al., 2004). For example, both Carter et al. (2017) and Sreckovic et al. (2017) analysed the efficacy of classroom peer support interventions for supporting children with ASD, with improved social interaction skills found in both cases. In Carter et al.'s (2017) pilot study of four adolescents with ASD, the use of a peer support arrangement for the participants was associated with increased social interactions with peers and maintained or increased academic engagement present in three of the four. Furthermore, in Sreckovic et al.'s (2017) study the use of a peer support network was associated with increased social interactions in secondary students with ASD and reduced rates of bullying directed at ASD students.

Other interventions found in education to manage Autistic traits have followed antecedent based models, as with the support of ADHD behaviours referenced in Section 2.3.1, where problems are pre-empted and managed before they occur. Myles and Simpson (2001) outlined pre-emptive strategies where schedules, activities and expectations were explicitly made clear to students with Autistic traits in advance help these students plan and prepare for activities and tasks. Research has demonstrated that priming Autistic students about assignments before giving them to them in class in greater observations of improved classroom participation and reduced disruptive behaviour by teachers (Fleury et al., 2014; Koegel et al., 2003).

To conclude, if support is in place, individuals with Autistic traits can function well in mainstream education (Department for Education & Department for Health, 2015; Estes et al., 2011; Richardson, 2017). However, without appropriate support research has implicated that both high and low functioning manifestations of Autistic traits are associated with reduced academic functioning (Dijkhuis et al., 2020; Hughes et al., 2021; Sutton et al., 2019). Despite the need for interventions to manage the impact of Autistic traits in the classroom and the efficacy of these interventions, the spectrum like nature of Autistic traits result in uneven skill profiles. Due to this, these students may require additional time in lessons or other materials or strategies to function well in education. These extra adjustments may make it difficult for teachers to appropriately implement these strategies or devote the time to students with Autistic traits while also balancing the needs of the other children in the classroom.

2.3.3 Attachment Patterns and Characteristics

The current and final section of the diversity of human behaviour in the classroom will introduce the role of attachment patterns in students. The ways in which attachment patterns have been shown to influence academic functioning and the interventions utilised by schools to manage maladaptive attachment patterns to support academic functioning. Attachment was defined by Ainsworth (1969; 1979) as '... an affectional tie that one-person (or animal) forms to another specific individual' (p. 970) that spans space and time. Early childhood attachments often form a blueprint for attachment patterns in later life, although attachment patterns are not fixed for life and can change over time, indeed, Cook et al. (2017) expressed that attachment influences self-perception and the self in relation to others which informs "... developmental competencies, including distress tolerance, curiosity, sense of agency and communication" (p. 392). If attachment is not healthy in the formative years, there can be a significant detrimental effect on development.

The work by Ainsworth (1969, 1970) and Bowlby (1969) pioneered the understanding of attachment with Bowlby introducing the concepts of emotional availability and attachment as an evolutionary driven response to ensure survival, whereas Ainsworth (1969) introduced the concept of specific attachment types. From the findings of the "Strange Situation" research, Ainsworth (1969, 1970) identified three attachment types (A, B and C or better known as insecure-avoidant, secure and insecure-anxious), with Main and Solomon (1986; Main & Solomon, 1990) identifying a fourth attachment style (insecure-disorganised). Secure attachment types are defined as those attachments which are characterised by high levels of emotional availability from the caregiver and responsivity to the child/adolescent. Insecureavoidant and insecure-anxious children may have had traumatic attachment experiences (Cook et al., 2017). As a result of these traumatic experiences, insecure-anxious children have developed a pre-occupation with their attachment to their figure, requiring contact and comfort but failing to be soothed by it (Bergin & Bergin, 2009). Alternatively, insecureavoidant children have learnt that as others cannot be relied upon to meet their needs, and may even be dangerous, it is safer and more beneficial to avoid close attachments to others (Bergin & Bergin, 2009).

There have been criticisms that the categorical model of attachment suggested by Ainsworth (1969) and Main and Solomon (1986; 1990) fails to appropriately capture the breadth of attachment behaviours individuals may demonstrate. Fraley and Spieker (2003a) tested the appropriateness of categorical models of attachment such as Ainsworth's (1969) and Main and Solomon's (1986; 1990). In a study of pre-existing data from 1,139, 15-monthold children tested through the "Strange Situation", it was found that a taxonomic approach to classifying attachment behaviours did not sufficiently capture attachment behaviour. The data used by Fraley and Spieker (2003a) instead was more consistent with a dimensional view of individual differences in attachment whereby the behaviours exhibited could instead be placed upon continuums of behaviour. Fraley and Spieker (2003a) suggested a model comprised of two dimensions measuring proximity seeking/withdrawal strategies and angry/resistant feelings or emotional confidence towards the caregiver. This was later extended to include attachment security (Fraley & Spieker, 2003b) following criticism from Cummings (2003). The classical attachment categories as suggested by Ainsworth (1969) and Main and Solomon (1986; 1990) can be successfully mapped onto Fraley and Spieker's (2003b) dimensional model of attachment whereby security of attachment is characterised by high emotional confidence and proximity seeking strategies (Figure 1). Therefore, the dimensional model of attachment as suggested by Fraley and Spieker (2003b) is perhaps a better alternative to the understanding attachment as it successfully captures the breadth of attachment unlike the classical categorical model suggested in older research.

Figure 1.

A Dimensional Model of Individual Differences in Attachment Compared with Attachment Categories from Fraley and Spieker (2003b).



Note. Figure reproduced from "What are the differences between dimensional and categorical models of individual differences in attachment? Reply to Cassidy (2003), Cummings (2003), Sroufe (2003), and Waters and Beauchaine (2003)" by R. C. Fraley and S. J. Spieker, 2003, American Psychiatric Association (<u>https://psycnet.apa.org/doi/10.1037/0012-1649.39.3.423</u>). Copyright 2016 by the American Psychological Association. Reprinted with permission.

The failure to develop healthy attachment characteristics (or attachment style as referred to in past research) can lead to children failing to learn appropriate emotional regulation strategies, mentalisation, insight, empathy and moral reasoning (Schore, 2001; Sroufe & Siegel, 2011). The inability to learn these core skills due to attachment issues is associated with the development of social, emotional and behavioural difficulties such as aggression (Mikulincer & Shaver, 2012). Indeed, adolescents with insecure attachments demonstrate behaviours such as dysfunctional anger, problem-solving avoidance and high amounts of internalising issues, such as emotional dysregulation (Sund & Wichstrøm, 2002). Maladaptive behaviours that arise from insecure attachment patterns, such as internalising issues and dysfunctional anger can be detrimental to functioning, particularly in education. For example, dysfunctional anger may inhibit the formation of peer relationships and therefore adversely impact group projects in the classroom. Bergin and Bergin (2009)

suggested that attachment patterns have at least two functions pertinent to classrooms. One such function is the feeling of safety that comes with attachment security which allows children to explore the school environment without fear and the second is the basis for socialisation and interaction skills students will utilise in their relationships with teachers and peers. According to Bergin and Bergin (2009), attachment patterns can influence academic functioning in individuals in two ways, directly through parental attachment and indirectly through attachment to teachers and schools. Therefore, a healthy (or secure) attachment pattern is fundamental in order to function well in education as this lends itself to greater feelings of safety in school and healthy development and socialisation while in school.

Research has suggested that positive parental attachment is positively correlated with academic success, for example, securely attached children are more likely to achieve better grades, be more socially competent and less delinquent (Bergin & Bergin, 2009). Furthermore, research by Duchesne and Larose (2007) demonstrated that in a sample of 121 adolescents (M = 12.97) attachment to both parents was positively correlated with perceived teacher support, which was characterised by teacher emotional availability and accessibility. In addition to this attachment to both parents was also positively correlated with and predictive of general academic motivation and interest in school. Further mediation analysis determined that perceptions of teacher support partially mediated the relationship between attachment quality (computed from both attachments to father and mother) and academic motivation.

The predictive nature of parental attachment patterns in relation to academic functioning is well documented. Indeed, in a longitudinal study of two infant cohorts (aged 3 in the first cohort and 2 in the second), attachment security between mother and child in infants predicted academic achievement in adolescence at the ages 14-15 (in the first cohort) and 11-12 (in the second cohort). Furthermore, attachment security was a significant predictor of effortful control, which was also found to predict academic achievement (Dindo et al., 2017). Furthermore, attachment patterns have been shown to predict later academic success, for example, attachment patterns have been found to predict university grade point averages (GPAs) and university graduation. In research by Kurland and Siegel (2020) on 85 first-year university students there was a significant difference in the GPA's of securely attached students compared to insecurely attached (including dismissive, preoccupied and fearful adult attachment classifications) students over eight academic semesters. Indeed, the secure students college graduation rate was much higher (43.75%) compared with insecure students graduation rate (27.91%, $x^2 = 3.961$, p = .047). Furthermore, attachment security was found to predict the cumulative, four-year university GPA of participants in the study. Similarly, work by Larose et al. (2005) found that autonomous, secure attachment patterns were associated with better learning dispositions. Learning dispositions are the emotional, behavioural and belief systems found in students with more positive learning dispositions indicative of positive emotional, behavioural and belief systems. However, while secure attachments were associated with better learning dispositions, insecure attachment patterns led to a decrease in learning disposition across this year with insecure-dismissing students achieving the lowest grade average in college. The research of Dindo et al. (2017), Kurland and Siegel (2020) and Larose et al. (2005) further establish that it is important for a healthy attachment pattern to one's parents to develop in the younger years because it predicts later academic achievement, which as referenced in Section 2.2 is associated with life trajectory including poverty and employment (Department for Work and Pensions, 2021).

As outlined earlier, teacher and school attachment also influence academic functioning (Bergin and Bergin, 2009). The student-teacher attachment is characterised by trust, affection and prosocial behaviour (Shaver et al., 2016). A positive, secure attachment between student and teacher can compensate for the lack of a secure parental attachment in students in the context of learning and exploration specifically (Schuengel, 2012). Indeed, teachers can act as a temporary safe haven and secure base for children in both primary and secondary school dependent upon the child's developmental pathway and needs (Verschueren & Koomen, 2012), able to substitute for absent parents in school by fulfilling attachment needs such as offering a safe base for exploration (Seibert & Kerns, 2009; Zsolnai & Szabó, 2020). An emotionally supportive teacher who is sensitive and responsive to students' needs has been shown to correlate with increased engagement from students in academic activities, increased avoidance of negative behaviours by students and more positive peer relations (National Institute of Child Health and Human Development & Early Child Care Research Network, 2002; Pianta et al., 1997). The protective and adaptive nature of teacher-student attachment in academic functioning has also been found in adolescents, despite pupils commonly changing teachers by lesson in secondary schools (Bergin & Bergin, 2009) and attachment focus changing to peers (Nickerson & Nagle, 2005). However, teacher-student attachment is not the only alternative to parental attachment in supporting academic functioning. Peer attachment has been shown to directly influence academic functioning in addition to teacher attachment. Greater peer attachment is positively correlated with psychosocial competence and a significant predictor of scholastic competence and therefore academic functioning (Fass & Tubman, 2002). This is particularly important in adolescence as attachment focus shifts from parents to peers at this point. However, as peer relationships are informed by the internal working model of relationships provided by early parental attachment, an insecure attachment to our primary caregiver can inform later problems in our relationships with our peers (Shomaker & Furman, 2009). Therefore, while positive peer attachments may positively influence academic functioning, it is apparent that this is somewhat dependent on a healthy parental attachment being in place for a healthy working model for later relationships. This suggests that the ideal scenario is the presence of a healthy

early parental attachment to positively predict later academic functioning (Dindo et al., 2017; Kurland & Siegel, 2020; Larose et al., 2005) and later relationships with our peers (Shomaker & Furman, 2009). The positive peer relationships amounting from this in turn is associated with positive effects on academic functioning (Fass & Tubman, 2002). However, should a healthy relationship with an early attachment figure not be possible to establish, teacherstudent attachments can be a viable alternative to support academic functioning in a worstcase scenario.

Given the link that attachment has to academic functioning, it is important to support those individuals with disturbed or unhealthy attachments in the classroom. The management of the impact of attachment issues in the classroom tends to focus on the social, emotional and behavioural problems that may amount from a disturbed attachment pattern (Schore, 2001; Sroufe & Siegel, 2011; Zarrella et al., 2018). Examples of utilised interventions that can be found in schools for attachment issues include theraplay, emotion coaching and nurture group provision. Emotion coaching is a relational and skills-based approach that involves recognising, labelling and validating children's emotions to guide them to problemsolve these issues using self-regulation strategies (Rose et al., 2015). Nurture group provision is another intervention to address the social, emotional and behavioural problems amounting from attachment issues through nurture and support with role modelling and social learning utilised (Boxall, 2013). Theraplay, like nurture group intervention, is another intervention designed to support and address behavioural, emotional or developmental concerns and improve the relationship between a parent and child.

There is substantial research evidence outlining the suitability and efficacy of emotion-coaching, nurture group provision and theraplay for management of social, emotional and behavioural problems in both secondary and primary schools (dependent upon the intervention). For example, in a two-part study over two years, 127 education and health and social care professionals and parents were trained in emotion coaching techniques. The professional practice and self-regulation of the participants were measured in addition to the self-regulation and behaviour of the children/young people who were working with the participants in the study. Results indicated that there was a positive impact on the professional practice of participants and positive impacts on both the self-regulation of the participants, children in their care and the child's behaviour. Nurture group provision has also been found to positively increase social, emotional and behavioural outcomes in primary school children when compared to schools without nurture-group provision (Sloan et al., 2020). These findings held for secondary school students in key stage three where nurture group provision led to improvements in all of the Boxall Profile competencies following completion intervention. The Boxall Profile competencies are elements of functioning such as engaging cognitively with others and emotional security (Cooke et al., 2008). Theraplay however seems to be the least efficient intervention with research demonstrating that in a sample of looked after children, school-based Theraplay was associated with non-significant improvements in the emotional, hyperactivity, conduct, peer problems and prosocial scales of the Strength and Difficulties Questionnaire. However, while these improvements were not statistically significant, further qualitative analysis highlighted that all schools involved in the project found that the intervention was valuable. Furthermore, children involved in the project highlighted that the Theraplay intervention was viewed as important for their wellbeing, and noticeable changes in relationship skills and academic engagement were also reported (Francis et al., 2017).

Work by Rose et al. (2019) utilised emotion-based coaching, nurture group provision, Theraplay and attachment psychoeducation to school staff in order to implement an "Attachment Aware Schools" intervention. The "Attachment Aware Schools" scheme incorporated 200 participants (comprised of 107 teachers and school support staff and 94 children aged five to 16) from 40 schools in the UK. School staff were trained on attachment theory, strategies and a school-wide emotion coaching intervention and targeted interventions such as nurture group provision and Theraplay were used. Following the implementation of Rose et al.'s (2019) "Attachment Aware Schools" training, participating schools and students were followed over one-year with findings demonstrating that pupils experienced significant improvements in academic achievement in reading, writing and mathematics. Teachers and school support staff reported a positive impact on all pupil behaviour with decreases evident in sanctions and exclusions of students.

To conclude, attachment patterns are best considered to be dimensional, rather than categorical as early research attempted to demonstrate (Cummings, 2003; Fraley & Spieker, 2003). The inability to develop healthy attachment characteristics and patterns leads to problems in socialisation, emotional regulation and behavioural manifestation (Mikulincer & Shaver, 2012; Schore, 2001; Sroufe & Siegel, 2011) that in turn are associated with issues in academic functioning (Bergin & Bergin, 2009; Dindo et al., 2017; Duchesne & Larose, 2007; Larose et al., 2005). However, while insecure attachment patterns are associated with poor academic functioning, the problems arising from them can be managed in the classroom with interventions such as emotion coaching, nurture group provision and Theraplay successfully managing the social, emotional and behavioural problems arising from disturbed attachment (Cooke et al., 2008; Francis et al., 2017; Rose et al., 2015; Rose et al., 2018; Sloan et al., 2020). Despite this though, the underlying cause cannot be treated in school only the subsequent issues, with teachers potentially providing alternatives to the healthy attachment that children usually require from a parent. Overall, attachment to parents, teachers and peers are important determinants of academic functioning, insecure attachment patterns to each of these entities have ramifications for classroom functioning. However, these can be managed

in the classroom and with support students who have attachment difficulties are able to succeed in education

2.3.4 The Limitations of the DSM and Biomedical Approach to SEND

The recognition and adoption of dimensional models of ADHD behaviours, Autistic traits and attachment characteristics is a deliberate attempt to circumvent the biomedical approach to SEND and the emphasis on the DSM (American Psychiatric Association, 2013) in the categorisation of atypical student behaviour and indeed mental health conditions more generally. Indeed, the emphasis on the requirement of clear and "objective" evidence of deficit or difficulty within certain contexts across an arbitrary period can lock some young people out of accessing support. For example, there is a clear sex imbalance in the diagnosis of ADHD and Autism (Loke et al., 2015; May et al., 2019; Mowlem et al., 2019), with boys more likely to receive a diagnosis than girls. However, research has suggested that there is a difference in the manifestation of behaviours between boys and girls. This can affect recognition and diagnosis, for example, boys are more likely to demonstrate more severe externalising behaviours, such as hyperactivity and aggression, than girls (Mayes et al., 2020) and therefore are more likely to be detected, diagnosed and support through the SEND process.

The threshold model implemented in the DSM (American Psychiatric Association, 2013) means that those individuals who fall under the diagnostic threshold often fail to gather enough evidence of difficulty to gain access to SEND provision. This is demonstrated in the work of Loke et al. (2015), May et al. (2019) and Mowlem et al. (2010), whom all show a sex division in diagnosis due to differential manifestations.

For those who do gain a diagnosis and are supported via the current UK SEND system, support seeks to address a perceived weakness or deficit. This focus on "fixing" problems within the individual propagates a notion of disability in students, without questioning the role of the wider context in disabling the individual. Needless to say, this continues to propagate negative stereotypes on the incapability of disabled individuals. Even the simple act of labelling a child SEND can result in negative outcomes including a deterioration of their mental health (Specht, 2013) or a self-fulfilling prophecy effect (Brophy, 1983; Francis et al., 2017) whereby the child ends up performing worse in line with externally imposed expectations. As the current SEND model focuses on remediating weakness only within individuals with empirical evidence of difficulty those who fall below diagnostic thresholds will not receive the same amount of support.

Limitations of the clinical model of SEND highlight the need for alternatives, one of which is the neurodiverse approach. The neurodiverse model of SEND has been gaining both interest and popularity in recent years. It proposes that deviation in typical behaviour in the form of neurological or psychological idiosyncrasies should be celebrated as a form of natural human divergence (Armstrong, 2012a, 2012b, 2015, 2017). The neurodiverse model of understanding SEND behaviour does not ascribe difficulties in education as a deficit within an individual, but rather a mismatch between the social context and its requirements and an individual's behaviour. Furthermore, the neurodiverse model places less emphasis on diagnosis, acknowledging that many of the categorical models of mental health conditions found in the DSM (American Psychiatric Association, 2013) fail to appropriately capture the breadth or depth of the symptomatology, as shown in research on ADHD and Autism (Coghill & Sonuga-Barke, 2012; Frazier et al., 2007; Marcus & Barry, 2011).

The neurodiverse model of SEND focuses more on the dimensional and unique nature in which behaviours, both positive and negative, can manifest and emphasises how to equip an individual to utilise their strengths to support areas of weakness (Armstrong, 2012a, 2012b). A movement away from support linked to diagnosis would therefore capture those students

who fall below diagnostic thresholds but still struggle in school and suitably reflect the dimensional nature of many mental health phenomena, including Autism, ADHD and attachment experiences (Coghill & Sonuga-Barke, 2012; Fraley & Spieker, 2003a; Frazier et al., 2007; Marcus & Barry, 2011).

Therefore, to conclude, the SEND model currently fails to appropriately capture the breadth of SEND behaviour that students may demonstrate and as such can miss students who fall below diagnostic thresholds. Furthermore, SEND support is targeted at addressing a perceived weakness within an individual student that can unintentionally single students out and propagate negative stereotypes and preconceptions about a lack of ability in SEND students without adequate questioning of the disabling nature of the school context. Due to these weaknesses within the SEND model, there is a clear need to consider other alternatives such as the neurodiverse model which has clear benefits in practice (Armstrong, 2012a, 2012b, 2015, 2017).

2.4 Self-Concept

The previous section outlined the relationship between academic functioning and ADHD behaviours, Autistic traits and attachment characteristics, and demonstrated that these adversely impact numerous aspects of both academic and general functioning, including social relationships and communication. It has also been found that individuals with ADHD, Autism and attachment issues have a worse perception of themselves both in education and generally, than their neurotypical peers (Doyle et al., 2000; Foley-Nicpon et al., 2012; Hay & Ashman, 2003; Houck et al., 2011; McCauley et al., 2018; Nishikawa et al., 2010). However to date, there has only been speculation as to the exact reasons why this relation is apparent. An individual's perception of themselves is their self-concept, which is comprised of attitudes, feelings and knowledge about abilities, skills, appearance and social acceptance

(West & Fish, 1973), this may be referred to as their general self-esteem. Their academic self-concept is, specifically, an individual's perception of their academic functioning (Trautwein et al., 2006). Both the academic and general self-esteem are important constructs in academic functioning because they can determine student behaviour such as academic engagement and, in the case of the academic self-concept specifically, predict later academic achievement. This section will therefore explore the connection between academic functioning and the academic self-concept and general self-esteem as demonstrated in the current literature with application to ADHD behaviours, Autistic traits and attachment characteristics. It will also consider the structure and formation of the academic self-concept and general self-esteem and the role that teacher plays in relation to the formation of the academic self-concept and general self-esteem.

Sánchez and Sánchez-Roda (2003) compiled four models which may explain the relationship between the academic self-concept and academic performance. Firstly, they posited that the academic self-concept determines academic achievement through social comparative effects, to a greater extent than academic achievement influences the academic self-concept. Marsh (1987; Marsh & Hau, 2003) posited that students compare their academic performance with that of their peers in which to form their academic self-concept. If the comparison is made between said hypothetical student and one of a higher academic ability or better academic performance, there would be an adverse effect on the academic self-concept. This would then feed into later academic behaviours as the student shifted their behaviour to be more congruent with their academic self-concept (see Marsh & Martin, 2011; Valentine et al., 2004). For example, they may stop completing homework tasks or reduce the effort spent in school. Therefore, leading to an adverse impact on academic achievement.

Secondly, the levels of academic self-concept determine academic achievement. Thirdly, that the self-concept and academic performance mutually inform and determine the other, essentially the reciprocal effects model posited by Marsh (1990a; Marsh et al., 1999; Marsh & Craven, 2006; Marsh & O'Mara, 2008). The fourth and final model is that additional variables may be the cause of both the academic self-concept and academic functioning. These additional variables were suggested by Sánchez and Sánchez-Roda (2003) to be potentially personal, environmental or even non-academic. Therefore, Sánchez and Sánchez-Roda (2003) postulate that in all models the self-concept and academic achievement are inextricably linked, the only uncertainty was how the directionality of the relation and the role of social comparison in the said relation.

To explore these models further and determine the relation between the academic selfconcept and achievement, Sánchez and Sánchez-Roda (2003) specifically explored the association and predictive relation between the academic self-concept on achievement. In Sánchez and Sánchez-Roda's (2003) research a significant positive correlation was found between academic performance and academic self-concept in primary school students. Furthermore, academic self-concept and general self-esteem were found to predict academic achievement. However, the predictive nature of achievement on the academic self-concept was not tested in Sánchez and Sánchez-Roda's research (2003). Therefore, it is only possible to conclude that the academic self-concept predicts achievement. Despite this limitation of Sánchez and Sánchez-Roda's (2003) work, the influence and predictive nature of academic achievement on the academic self-concept has been well documented in the reciprocal effects research by Marsh (1990a; Marsh et al., 1999; Marsh & Craven, 2006; Marsh & O'Mara, 2008).

Burger and Naudé (2019) further confirmed the predictive nature of academic selfconcept in academic success in a sample of 164 South African high school students with academic self-concept significantly explaining variance in the academic success of students. Furthermore, research by Susperreguy et al. (2017) confirmed the findings of Burger and Naudé (2019) demonstrating that math and reading self-concept predicted later achievement in maths and reading in three longitudinal data sets representative of different populations, regardless of achievement levels. In addition to this Talsma et al. (2018) also found that selfefficacy predicted later achievement in both children and adults, Talsma et al. (2018) referred to this relationship as "I believe, therefore I achieve" (p. 1). Finally, Jaiswal and Choudhuri (2017) also found evidence of a predictive relationship between the academic self-concept of secondary school students and subsequent achievement later, although this relationship was stronger in female students than male students. Regardless, the work of Susperreguy et al. (2017), Burger and Naudé (2019), Talsma et al. (2018) and Jaiswal and Choudhuri (2017) demonstrate a link between the academic self-concept and academic functioning. This in turn has clear implications for those students with additional considerations, such as Autistic traits or maladaptive attachment characteristics.

General self-esteem has not received the same amount of supporting research highlighting its relation to academic achievement but remains important to academic functioning. Baumeister et al. (2003) suggested that while self-esteem is correlated with school performance, this does not mean that self-esteem predicts performance; indeed, attempts to improve self-esteem has not been shown to lead to improvements in academic functioning. Furthermore, Pottebaum et al. (1986) demonstrated no link between general self-esteem and academic achievement in 10th and 12th-grade students. However, while the general self-concept may not be overtly linked with academic achievement, it influences general functioning and wellbeing that can influence functioning in school. For example, self-esteem has been linked to the propagation of relationships with others (Buhrmester et al., 1988) and therefore clearly beneficial in social interaction, while also being correlated with happiness (Diener & Diener, 1995) and protective against depression in addition to fostering resilience to failure (Baumeister et al., 2005). All of these factors, while not overtly beneficial
to fostering academic achievement, are useful in navigating the classroom context and school experience.

It is apparent that the academic self-concept and general self-esteem an individual has is unique to each person and is informed by their particular circumstances, which will therefore influence their functioning in school. Research has demonstrated that the presence of ADHD behaviours is negatively correlated with both the academic self-concept and general self-esteem (Marcum & Pond, 2007), with a significant difference in self-esteem between individuals with a higher and lower presence of ADHD behaviours (Perifanou, 2020). In the case of Autistic traits, those who are unable to find a positive meaning in their experience of Autism report worse self-esteem¹ than typically developing individuals (Nguyen et al., 2020), and finally, secure attachments are positively associated with selfesteem and self-concept clarity (Kawamoto, 2020), with early sensitivity and non-hostility by the mother to the child predicting later self-concept (Paulus et al., 2018).

To further understand why ADHD behaviours, Autistic traits and attachment characteristics are associated with a worse self-concept, it is important to explore the theoretical model of the self-concept in more detail for greater understanding. Therefore, the following section will introduce the theoretical basis upon which the self-concept will be considered in this research with reference to the accepted Marsh and Shavelson (1985) model

¹ Self-concept and self-esteem/self-efficacy are often used interchangeably (Huitt, 2009) although historically have been differentiated, with self-esteem suggested to be evaluative and self-concept descriptive (Beane & Lipka, 1980) and self-efficacy specifically forward looking (Bong & Skaalvik, 2003). However, the Marsh and Shavelson (1985) model of self-concept is both forward and backward looking and has both an evaluative and descriptive element, which therefore encompasses self-esteem. For brevity, this work will consider both self-esteem and self-concept to be the same construct and will refer to self-esteem throughout.

of self-concept, its construction, and the role teachers play in influencing a student's selfconcept.

2.4.1 The Multidimensional, Hierarchical Model of Self-Concept

The Marsh and Shavelson model (1985; Marsh et al, 1988) of self-concept posited the self-concept as a responsive and malleable construct that is multifaceted, hierarchical, evaluative, descriptive and suitably differentiated from other constructs (demonstrated in Figure 2). At the apex of the construct are the overall academic self-concept and overall non-academic self-concept, which in turn are created from specific domains such as mathematics or same-sex peer relationships. These specific domains are in turn created from behaviour perceptions at the base of the model. The overall general academic/non-academic self-concept sare stable, but specific domains (such as mathematics or same-sex peer relationships) are less stable, with other domains of the self-concept appearing through development. Other theories on the self-concept include unidimensional models of a general self-concept factor (see Marsh & Craven, 2006; Marx & Winnie, 1978; Van Zanden et al., 2015) and independent or correlated factor multidimensional models. However, these models have largely been refuted with the multidimensional model strongly supported for use in educational psychology (Marsh & Craven, 2006).

Figure 2.

Shavelson et al.'s original model of the Academic Self-Concept (A) compared with the Marsh and Shavelson revision (B).



Note. The figure is from "a Multifaceted Academic Self-Concept: Its Hierarchical Structure and its Relation to Academic Achievement" by H. W. Marsh, B. M. Byrne and R. J. Shavelson, 1988, American Psychological Association (https://psycnet.apa.org/doi/10.1037/0022-0663.80.3.366). Copyright 1988 by the American Psychological Association. Reprinted with permission.

The self-concept is informed by and constructed from the information we receive about ourselves, including our abilities and performance. Our academic self-concept can be influenced and informed by achievement-related feedback, for example, grades (Marsh & Hau, 2004), perceptions of peer competency (Buhs, 2005; Cole et al., 1997), teacher (Bouchey & Harter, 2005; Spinath & Spinath, 2005) and parental feedback (Gniewosz, 2010) In 2018, Marsh et al. drew together three theoretical models to form an integrated model of the formation and development of the academic self-concept incorporating the internal/external frame of reference model (Marsh, 1986a; Marsh & Yeung, 2001), the reciprocal effects model (Marsh, 1990a; Marsh et al., 1999; Marsh & Craven, 2006; Marsh & O'Mara, 2008) and the "Big-Fish-Little-Pond Effect" (BFLPE: Marsh, 1987). Research by Marsh et al. (2018) demonstrated the interconnected and complementary nature of these three models in a longitudinal study over six years (from the end of primary school to the fifth year of secondary school) on 3,370 German students from 42 schools. Maths self-concept, school grades, test scores and school-level contextual effects were measured with maths grades found to positively influence maths self-concept (frames of reference), while other subjects did not. The maths self-concept was found to be predictive of and predicted by maths test scores and school grades (reciprocal effects model), and finally, average achievement levels in the school negatively affected students' maths self-concept (BFLPE).

Before integration by Marsh et al. (2018) these three models independently explained the development and construction of the academic self-concept. The frames of reference model (Marsh, 1986a; Marsh & Yeung, 2001) has been widely supported in research (Marsh et al., 2018; Skaalvik & Skaalvik, 2002) and differentiates between internal and external frames in which information is interpreted. Internal frames of reference involve students comparing performance between subjects, explained by Gniewosz et al. (2012) as "I am better in math[s] than in English" (p. 538). Whereas external frames of reference in an educational context involve students comparing performance between themselves and other students in a specific domain. Gniewosz et al. (2012) gave the example of "in math[s], I am better than most other students" (p. 538). Marsh et al. (2018) simply defined the frames of reference model as "my accomplishments in one domain relative to my accomplishments in other domains" (p. 4). Despite the support of the frames of reference model, there has been some evidence critiquing the internal/external frames of reference model. In research by Bong (1998) the frames of reference model failed to receive clear support, although this was later refuted by Marsh and Yeung (2001) through reanalysis which provided support for the frames of reference model as posited by Marsh in 1986(a).

The reciprocal effects model posits that there is a mutual feedback mechanism whereby academic success or failure informs academic self-concept which in turn influences performance and so on (Marsh & Martin, 2011), or as Marsh et al. (2018) conceptualised it "my current accomplishments relative to past accomplishments" (p.4). The origins of the reciprocal effects model can be found in earlier research by Marsh (1990a) and subsequent work (Arens et al., 2017; Marsh et al., 1999; Marsh & Craven, 2006; Marsh & O'Mara, 2008). Since Marsh's (1990a) initial suggestion of a reciprocal effects model in academic achievement and academic self-concept substantial other research has supported this theory including work by Schöber et al. (2018) who demonstrated that in a sample of 1597 German secondary students, mathematics and reading self-concepts were found to demonstrate a positive effect on later mathematics and reading achievement respectively in a one-year study. Furthermore, Preckel et al. (2017) tested the presence of a reciprocal effects model in students who attended both gifted and regular classes. A sample of 283 students in special classes and 639 students in regular classes had their mathematics achievement and mathematics self-concept tested four times from grades five to seven. Reciprocal effects between achievement and self-concept were present across both the special and regular classes. Thus, further supporting the findings of Schöber et al. (2018) and confirming Marsh's (1990a) theory of the presence of a reciprocal effect between achievement and selfconcept formation.

The BFLPE (Marsh, 1987) demonstrated that students in more selective, higherperforming schools had worse academic self-concept than a student of comparable ability in a lower-performing, regular school. As Marsh et al. (2018) explained the BFLPE is a comparative process whereby students consider "my accomplishments relative to those of my peer group" (p. 4). Although research has demonstrated that the BFLPE also translates down from average school ability to average classroom ability, whereby the average classroom ability influenced the students' subject-specific self-concept (Dumont et al., 2017). For example, Marsh and Johnston (1993) demonstrated that when academically disadvantaged children were moved from special classes into mixed ability classes their academic selfconcept deteriorated as they compared themselves to their more advantaged peers. Furthermore, Tracey and Marsh (2000) demonstrated that intellectually disabled children had a higher academic self-concept in special IM classes than in regular classes. Köller et al. (2006) explained that this occurred not due to the target student but the students around them. In a higher-performing school or class, there are more opportunities for upward comparisons which are related to poor self-esteem (see Dickhäuser & Galfe, 2004), whereas in lowerperforming schools/classes there is more opportunity for downward comparisons which improve the student's academic self-concept. The BFLPE has been substantially supported in research, including work by Hoferichter et al. (2018) who found that all four facets of the academic self-concept (social, criterial, absolute and individual) as measured by the Scales for Recording the School Self-Concept (SESSKO: Schöne et al., 2002) were significantly related to the average-class achievement with the social academic self-concept being the most related. Furthermore, the BFLPE has been supported in a large-scale review of 4000 15-yearolds from 26 countries, with school-average achievement found to negatively predict the academic self-concept in all 26 countries (Marsh & Hau, 2003).

Both the BFLPE and frames of reference model incorporate social comparison as a means by which the academic self-concept and general self-esteem is informed. The social comparison process has its origins in the work of Festinger (1954), who introduced social

comparison theory which suggested that individuals compare themselves with others to understand themselves in an absence of objective standards, such as grades in education for example. Festinger (1954) explained that students engage in upward and downward comparisons. In upward comparisons, a student compares themselves with someone whom they perceive to be more capable than them and downward comparison is the opposite. Felson and Reed (1986) identified three ways that social comparison between students could influence an individual's self-concept. According to Felson and Reed (1986) on some occasions, social comparison can lead to a normative effect whereby students construct an academic self-concept that is similar to their classmates. However, a contrast effect can also occur whereby those students who conduct upward comparisons (comparing with someone of higher ability to motivate the student) may sometimes develop a less favourable academic self-concept. The contrast effect is well documented in research with children showing a worse academic self-concept and general self-esteem following upward comparisons on those who performed better in a mathematics exam than the target student (Dickhäuser & Galfe, 2004). According to Felson and Reed's (1986) three suggestions, the final social comparison that may occur is an associative effect whereby an upward comparison leads to a better academic self-concept and general self-esteem.

However, while students compare across ability ranges, Festinger (1954) specified that their must not be too large a discrepancy between the students abilities that it would be impossible for one student to meet the others, he referred to this as the similarity hypothesis. However, in practice evidence for this is scarce (Dijkstra et al., 2008) which seems to suggest that students can make unrealistic comparisons that could adversely impact the academic selfconcept and general self-esteem of students, especially when considering it is current practice for students of varying abilities and capabilities, including SEND children to be included in the classroom (as referenced in Section 2.2). The adverse impact of social comparison in the classroom however extends beyond damage to the self-concept and can include evaluative anxiety, especially within a high-performance classroom and sadness following failed academic performance (Hattie & Timperley, 2007).

While the cognitive and affective consequences of social comparison in the classroom may adversely impact the student and their academic self-concept and general self-esteem, the behavioural consequences tend to be positive. Research has found that generally speaking social comparison leads to an improvement in academic performance (Foot & Lee, 1970; Light et al., 1994), particularly in the case of upward comparisons. For example, Altermatt and Pomerantz (2005) demonstrated that when a low-achieving student's best friend became more high-achieving the low-achieving students' performance also increased. However, their academic self-concept was less positive than a low-achieving student with a low-achieving best friend. This adaptive nature held for future performance with social comparison predicting academic performance three months later (Blanton et al., 1999). Therefore, this suggests that while interpersonally social comparison can result in negative affective states and the deterioration of self-concept in students, it can be beneficial for improving academic performance.

Therefore, to summarise, substantial research has implicated that the self-concept has a hierarchical, multidimensional structure with different facets pertaining to different areas. The structure overall is relatively stable, but as one descends to specific domains and further to behaviours these become more unstable (Marsh & Shavelson, 1985). However, when considering that the academic self-concept is largely informed by the information presented to students and comparative processes in the classroom it is important to consider the role of the teacher in influencing the self-concept of students. Although classrooms in modern education set children for ability, these classrooms are inclusive contexts with natural deviation in skills, ability and student traits found in classroom cohorts. Indeed, in many modern classrooms' children with additional considerations such as SEND are included in the cohort with teachers directed to support those students with difficulties. However, this makes for an environment where comparison between lower ability and higher ability students is possible which has implications for the academic self-concept and general self-esteem development as demonstrated in the work by Marsh (1987; 2018; Marsh & Hau, 2003; Marsh & Johnston, 1993; Tracey & Marsh, 2000). Thus, the role of the teacher in supporting students who are academically disadvantaged or struggling in class will be considered further. In addition to this further exploration will be given to the role teachers and their responses students may have in influencing the students' academic self-concept and general self-esteem.

2.4.2 The Role of the Teacher in the Student's Self-Concept

Teachers' expectations of students at the individual and class level underpin the feedback and behaviours they demonstrate towards students and classes which in turn influences the academic self-concept and general self-esteem, of students. Teachers overtly provide achievement-related feedback such as grade but also covertly feedback through behaviours directed towards students and their peers which are interpreted and internalised into a student's academic self-concept and general self-esteem (Bouchey & Harter, 2005; Marsh & Hau, 2004; Spinath & Spinath, 2005). Teachers' expectations are based on the knowledge they have about their students, including previous achievement, in-class performance and teacher stereotypes and biases (Chen et al., 2011; Friedrich et al., 2015). Research has demonstrated that teachers have lower expectations of those individuals with SEND conditions (including disabilities), certain racial origins, socioeconomic status or problematic classroom behaviour (Beilke & Yssel, 1999; Bianco & Leech, 2010; Hurwitz et al., 2007; Jussim et al., 1996; Rubie-Davies et al., 2006; Rubie-Davies & Peterson, 2016; Tenenbaum & Ruck, 2007). Lower teacher expectations of those who may experience more

difficulty in the classroom is concerning because teacher expectations predict future academic self-concept at both the individual (Pesu et al., 2016; Trouilloud et al., 2002; Trouilloud et al., 2006) and class level (Rubie-Davies, 2006).

Class expectations rather than student expectations, however, may depend on the perception the teacher has of the group, rather than the individual (Szumski & Karwowski, 2019). Friedrich et al. (2015) went on to explain that for the teacher expectancy effect to occur at the class level, classes must be differentiable, such as in the case of low/high ability classes. Although this is not always the case, homogenous classes such as those where students are grouped by ability do not show evidence of a teacher expectancy effect, although heterogeneous classes where disabled students and differential abilities are in the same class do show evidence of a teacher expectancy effect (Smith et al. 1998). Smith et al. (1998) suggested that this was due to teachers finding it easier to accurately appraise students' abilities and behaviours in homogenous classes, there is a baseline and ceiling of capability so to speak.

Teacher expectations inform the feedback and behaviour aimed at students and classes, with feedback to low expectancy students suggested to differ from high expectancy students (Brophy & Good, 1970). Indeed, lower expectations of students with disabilities has been related to teacher failure in recognition of giftedness in students with emotional and behavioural disorders, due to their behaviour contradicting teachers' perceptions of gifted students (Bianco & Leech, 2010; Reid & McGuire, 1995). Teachers have been suggested to provide more attention and support to those of whom they have higher expectations, in addition to offering more challenging material, be more responsive to students' work and interacting with high expectancy students for longer (Friedrich et al., 2015; Rosenthal & Jacobsen, 1968). However, other research has found a contrary effect with both teacher and student reports suggesting that lower expectations of students lead to greater help and support

in class from teachers (Blöte, 1995). Teachers' feedback to students is informed by their perception of the students' needs (Hattie & Marsh, 1996) and their expectations which results in changes in the students' academic self-concept and general self-esteem and subsequent behavioural changes as the student attempts to conform to the teacher's expectations (Friedrich et al., 2015; Rosenthal & Jacobsen, 1968). Students strive to maintain the integrity of their overall self-concept (including academic and non-academic domains) and adjust their behaviour through self-affirmation (acting to demonstrate that the self-concept is accurate; Steele, 1988) and self-regulation processes (adjustment of behaviour to reduce the discrepancy between behaviour and self-concept; Scheier & Carver, 1988).

The feedback teachers provide to students can take multiple forms; however, positive feedback is of greater benefit to overall self-concept (including both academic and nonacademic domains) formation than negative feedback (Burnett, 1999; 2003). Hattie and Timperley (2007) outlined four methods of feedback teachers use to affirm and appraise progress by students, these are feedback about the task, feedback about the processing of the task, feedback about self-regulation and finally feedback about the self. Of these four tactics of interest to the academic self-concept and general self-esteem is the feedback about the self. Hattie and Timperley (2007) argued that feedback about the self is the least effective feedback teachers can give to students about performance. Self-related feedback is one of the most common feedback strategies used by teachers and according to Hattie and Timperley (2007) too often used instead of other more efficient strategies. Indeed, research by Floress and Jenkins (2015) found that among teachers of young children praise was common and frequent, however, it was directed primarily towards the self rather than specific behaviours the student demonstrated. Hattie and Timperley (2007) criticised self-oriented feedback by teachers as failing to contain any task-related information that can be converted by the student into information to improve the academic self-concept and subsequent academic functioning.

However, Marsh (1984) differentiated between ability and effort related feedback. Both effort and ability related feedback are pivotal forms of information for the formation of the academic self-concept. However, ability related feedback is preferred to effort related feedback due to the connotations it has for assumptions of the students' competency (Craven et al., 1991). Indeed, students who attribute academic success to their ability have a more positive academic self-concept than those who attribute it to other means (Marsh, 1990b). Although ability related feedback is valued more by students, students require both ability and effort related feedback as a singular focus on ability or effort can lead to unintended effects on the academic self-concept. Indeed, Mueller and Dweck (1998) found that children who received effort related feedback following failure were more likely to attribute their failure to issues with their effort in the task and were more likely to demonstrate increased effort in subsequent tasks. Conversely, ability feedback following failure led to low subsequent effort and frustration due to the belief they were not able to complete the task successfully.

Ability and effort related feedback, in particular, appear to be heavily involved in the construction of the academic self-concept. Considerable amounts of research has highlighted that humans tend to attribute success to their effort and ability, in line with Marsh (1984) and Craven et al.'s (1991) suggestion that both are integral to the overall self-concept formation. Indeed, students with a more positive academic self-concept have been suggested to engage in achievement-related behaviours such as studying, completing homework and engagement in class to confirm their perception of good academic ability (Pajares et al., 2000) while also maintaining feelings of good academic capability (Valentine et al., 2004). Conversely, students with a negative academic self-concept may engage in defensive and handicapping behaviours to protect themselves from negative, ability-based feedback on poor academic performance that is threatening to their overall self-concept (Valentine et al., 2004). Marsh

(1986b) defined this as a self-serving effect, noting that attributing failure to external causes to protect the self-concept was a reasonable response.

Thus, the teacher feedback to students is largely dependent on the expectations they have of the student, or indeed the class (Brophy & Good, 1970), which in turn has implications for the academic self-concept and general self-esteem of students, dependent upon the form of feedback delivered. Teacher expectations are in turn informed by the knowledge they have about their students and classes, including previous achievement, inclass performance/ability and teacher stereotypes/biases (Chen et al., 2011; Friedrich et al., 2015). This suggests a self-fulfilling prophecy and feedback mechanism where teacher expectations predict behaviour demonstrated which is information for students to establish their academic self-concept and general self-esteem and subsequent behaviours. Therefore, reinforcing the initial teacher expectation and continuing the cycle further (Friedrich et al., 2015). The teacher expectancy effect is thus a powerful component in influencing student performance and the academic self-concept and general self-esteem of students, although it is more apparent in heterogeneous classrooms (Friedrich et al., 2015) such as those found in the modern UK education system whereby students with disabilities are included in regular classes and there is variation in student ability. The commonality of inclusive, diverse classrooms, therefore, sets the stage for a highly comparative environment where the differential abilities in the classrooms lead to different treatment by teachers based on student needs that could unintentionally, adversely impact student self-perception.

2.5 Summary

To summarise, the English education system seeks to educate many students in roughly the same, standardised way while also making classrooms inclusive and accessible to the needs of students in the classroom. This is done through adaptive teaching and reasonable adjustments to support the needs of those students who may be academically disadvantaged. However, while adaptive teaching and reasonable adjustments are excellent adaptations to make education inclusive, adaptive teaching has come to be conflated with connotations of SEND and disability. Although this is not always the case. An individual can struggle in education without being SEND due to the way in which we are all differently able and disabled by specific contexts that may be contrary to our own behaviours. Regardless of this, children who are identified as SEND are appropriately supported through adaptive teaching or more formalised IEPs and EHCPs. However, interventions such as the IEP and EHCP currently focus on remediating perceived deficits in the individual, rather than the disabling nature of certain contexts and environments (as referenced in Section 2.2).

Some common examples of SEND conditions found in children and adolescents are Autism, ADHD and maladaptive attachment patterns. The presence of ADHD, Autism or disturbed attachments in students has been shown to adversely impact their academic performance and achievement and are likely to co-occur. ADHD, Autism and attachment patterns are usually considered categorically in both clinical and educational practice as either present (diagnosed/insecure attachment pattern) or absent, despite more modern research suggesting that ADHD, Autism and attachment are best conceptualised as dimensional constructs. Dimensional models posit a spread of behaviour in a continuum in the population, this means that every student in the classroom will manifest the behaviours to some degree. However, as referenced previously the classroom works on a SEND and clinical paradigm where interventions for these concepts requires a diagnosis and is therefore to some extent incongruent of the understanding of them dimensionally. Despite this, teachers can and do attempt to adapt their teaching to the needs of their student cohort without a diagnosis and interventions in the classroom for ADHD behaviours, Autistic traits and attachment characteristics have been shown to work and positively increase academic outcomes (as referenced in Section 2.3).

Despite the efficacy of these interventions the underlying philosophy pertaining to their implementation is one of addressing a perceived deficit in the individual. These interventions addressed to support the individual therefore likely have the unintended effect of also implicitly suggesting the student is different or incapable of success without them. This will, over time, alter the students' perception of themselves to believe they are less capable and therefore alter the self-concept of the individual. Indeed, the self-concepts of individuals with ADHD behaviours, Autistic traits and insecure attachment characteristics are worse than in individuals without these characteristics, and the self-concept an individual has is influential in academic functioning and achievement (as referenced in Section 2.4).

Chapter 3 - Method and Methodology

In this chapter, the underpinning research methodology, including the ontological and epistemological stance of the researcher will be introduced and explained. Following on from this, the method will outline each study conducted as part of this doctoral thesis, outlining the participant cohort, procedure, measures used, and analysis conducted throughout. The latentinteraction structural equation model (LISEM) used in this doctoral thesis will also be outlined including interpretation of the model fit between the theoretical model posited and the data collected in the quantitative element of this doctoral research.

3.1 Research Questions and Hypotheses

The purpose of this thesis was to explore the relationships between behaviours associated with ADHD, Autism and attachment irregularities and the academic self-concept and general self-esteem of adolescents, framed by teacher cognitions on the management and impact of these behaviours in class. The focus was to determine how normally distributed behaviours associated with ADHD, Autistic traits and attachment characteristics in a typical classroom cohort related to the academic self-concept and general self-esteem of sixth-form students and how teacher perceptions and management might inform and explain this relationship.

This chapter begins with the three questions this thesis aims to address and the hypotheses established:

1) What are the relations between attachment characteristics, Autistic traits, ADHD behaviours and the academic self-concept and general self-esteem of adolescents in sixth form colleges in the UK?

i) These are related to the academic self-concept and general self-esteem of adolescents in sixth-form colleges.

2) Is there evidence of an interactive or summative effect in the relation between attachment characteristics, Autistic traits and ADHD behaviours to the academic self-concept and general self-esteem of adolescents in sixth form colleges in the UK?²

i) Due to an absence of past research exploring ADHD, attachment andAutism dimensionally with the academic self-concept and general self-esteemof adolescents it is not possible to hypothesise this relation a priori.

3) What are teachers' perceptions and reported management styles of ADHD behaviours, social and communication difficulties of Autism and attachment characteristics exhibited by students in the classroom?

3.2 Methodology

Before beginning the research, it is important to outline the researcher's own epistemological and ontological stance and the paradigm which informed the research. A research paradigm has been defined by Kuhn (1962) as a 'set of common beliefs and agreements shared between scientists about how problems should be understood and addressed' (p. 45). Therefore, this research was conducted with the following assumptions:

1) The behaviours associated with ADHD, Autism and attachment irregularities are manifest variables that are empirically observable. The presence of these behaviours can be measured objectively with the resulting data theory-neutral and interpreted without assumptions or presuppositions.

² Interactive effects refer to the testing of a moderation effect whereby one of the predictor variables (such as ADHD behaviours) may instead moderator (or influence) the relation between another predictor variable and the outcome variable (academic self-concept or general self-esteem). A summative effect is simply each predictor adding onto the other in regard to their predictive effect on the academic self-concept and general self-esteem. Both interactive and summative effects are tested due to an absence of past research proving either of these effects and anecdotal evidence, referenced in Section 2, that attachment patterns may moderate the influence of ADHD.

2) The relationship of these behaviours to the academic self-concept and general selfesteem of adolescents is informed by the wider context. The academic self-concept and an adolescents general self-esteem are intangible concepts that are responsive to our environment and experiences (as referenced in Section 2.4). When considering the relationship between attachment characteristics, Autistic traits, ADHD behaviours and the academic self-concept and general self-esteem, it is apparent that the relationship informed by an individual's experience in school.

3) School and formal education are social constructions defined by policy, relationships and contextual demands. This construction will inform and influence the interpretation of the nature of student behaviours in the classroom, teacher role and responses to these behaviours, and the academic self-concept and general self-esteem of students.

There are some core discrepancies between these assumptions that need to be considered. Fundamentally, the consideration of behaviours associated with ADHD, Autism and attachment irregularities as empirical and objective is contrary to the acknowledgement that school and education are social constructions. These two stances propose contrasting views on the nature of reality, with one view of reality as objective and based on empiricism and one based on human interpretation and perception. However, this researcher believes that there are multiple positions, one which is based on empirical concepts and one on the human experience.

The acknowledgement of the existence of multiple realities involves acceptance of the principles associated with both positivism and constructivism. Positivism is the adopted paradigm for most natural sciences and is the paradigm adopted for testing the relationship between behaviours associated with ADHD, Autism and attachment irregularities and the academic self-concept and general self-esteem. Positivist principles state that the world is

fundamentally empirical, with only information perceived by the senses considered to be 'real' and existing. Positivists accept or reject facts depending on their relation to empirical data, which should be theory-neutral, objective, interpreted the same by any who view it and described without any assumptions or presuppositions. Positivists create and test knowledge through the hypo-deductive method, whereby an initial theory of hypothesis is generated and repetitively tested. If a theory or fact has no empirical support it is generally rejected or amended until the data supports the posited theory (Keat, 1979).

Positivists in the social sciences attempt to replicate these principles from the natural sciences (Keat, 1979) and apply the concept of scientific laws to social constructions and human functioning.

Constructivism is a contrary stance to positivism and forms the underlying philosophy behind the exploration of teacher cognitions on student behaviour found in this thesis. Constructivists argue that the human experience cannot be limited to just behaviours as found in the positivism paradigm in the social sciences, and to attempt to do so results in behaviourism (Keat, 1979).

Constructivism is concerned with the understanding of the human experience through a focus on participants' interpretation of the socially constructed world, with an acknowledgement that the researchers' own experiences influence the conclusions and interpretations they make from the participants' responses (Mackenzie & Knipe, 2006). As opposed to positivists, constructivists inductively generate theory throughout the research process, incorporating elements of postpositivist and interpretivist paradigms (Levers, 2013). Meaning is created through an interpreter and interpreted interaction (Crotty, 1998). The interpreter cannot be objective, but they remain separate from the phenomena. Meaningmaking between the interpreter and interpreted is informed by society and other phenomena. To this end, unlike in positivism, the findings themselves are constructs and cannot be claimed to be true or 'factual'.

To address the research questions outlined in Section 3.1 regarding the prior assumptions stated at the beginning of Section 3.2, a mixture of quantitative and qualitative methods are needed. Therefore, a mixed-methods design was utilised in this thesis as an attempt to marry together the fundamentally dichotomous constructs of positivism and constructivism. The acknowledgement of the objective and empirical basis of the behaviours associated with ADHD, Autism and attachment irregularities requires a positivist paradigm and quantitative methods. However, recognition of the school and education as a social construct that informs the interpretation of behaviour and behavioural responses by teachers requires a constructivist paradigm and a qualitative approach to inquiry.

Mixed-methods research is a widely advocated and common approach to research in a variety of disciplines ranging from education (Symonds & Gorard, 2008) to health and social care (Johnstone, 2004; Pawson & Tilley, 2001). By incorporating multiple methods of inquiry there is an acceptance of both positivist and constructivist paradigms as valid and appropriate means of understanding reality and knowledge.

Mixed methods research attempts to integrate the dichotomous ontological and epistemological principles and assumptions found in positivism and constructivism in its theory on the nature of knowledge and reality. The need for integration between these conflicting paradigms was highlighted in the 'paradigm wars' of the 1980s (Hall, 2013) where constructivist and positivist researchers clashed over opinions on the nature of knowledge, reality and methods of research inquiry.

To that end, mixed methods research offers aparadigmatic, multi-paradigmatic, or a different singular paradigm approaches to inquiry that are different from positivism and

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constructivism. Shannon-Baker (2016) compared four paradigms found in mixed methods, these included transformative-emancipation, dialectics, critical realism and pragmatism. From the exploration of these stances, it was clear that some stances were inappropriate such as transformative-emancipation which focuses primarily on social justice research. The most appropriate paradigm for use in this project was that of critical realism. Critical realism in mixed methods research has been defined as:

"a philosophy of science that is founded upon a priori or necessary truths about the nature of the world. Critical realizes maintain that progress is possible because the intransitive dimension of reality (enduring structures and processes) provides a point of reference, against which theories can be tested." (p. 69 McEvoy & Richards, 2006).

According to Maxwell and Mittapalli (2010 cited in Shannon-Baker, 2016), critical realism emphasizes context, recognizes the incomplete nature of theory, believes that complete objectivity is impossible, and can make causal inferences from the mixed methods approach. Critical realism originated between 1970 and 1980 in the work of Bhaskar (1975; 1986) as a philosophical stance to research posits that ontology is not reducible to epistemology and that human knowledge is only a small representation of reality. Indeed, according to Bhaskar (1975; 1986), reality has three levels and is often thought of as an iceberg. The first level or apex of the iceberg is the empirical level in which events or objects as we experience them can be measured but are interpreted through our own human lens. The second level is that of the actual. There is no human experience to this, and events occur whether we experience them or not. Finally, the third level is the real nature of reality, at this level causal mechanisms exist, which are the properties of an object or structure to produce an event such as those appearing on the empirical level (Sayer, 2000).

Critical realism attempts to explain social events using both "abduction" and "retroduction" (Fletcher, 2017; Olsen, 2007). Abduction is theoretical redescription, where empirical data is redescribed with reference to theoretical concepts. Retroduction takes abduction a step further and attempts to infer causation and explanations from research findings. Abduction is apparent in this project through the application of the findings of both the quantitative and qualitative phases to self-concept theory, particularly Marsh et al.' (1985; 1988) model of the self-concept. The retroductive element is the application of the findings of the qualitative phase of this project to the findings of the quantitative phase to make assumptions around causality and infer explanations for the relations demonstrated in the quantitative phase. Therefore, due to the focus of critical realism on explaining social phenomena, it is clear that the critical realist philosophy is the most appropriate paradigm in which to conduct this research. This is due to the aim of the qualitative phase to supplement the empirical findings of the quantitative phase to attempt to explain the relations demonstrated in the quantitative phase of the PhD.

The assimilation of quantitative and qualitative projects in this thesis was carried out through the use of an embedded mixed methods design (Creswell & Clark, 2017) with similarities also apparent between the structure of this thesis and an embedded correlational design. Greene et al. (1989) suggested five categories of purpose with which a mixedmethods design offers a suitable protocol for conducting research. Of these five categories, this thesis falls into two of these categories, being: 'development' and 'complementing', where one method informs the development of another in sequence and areas of overlap are explored through different methods for enhancing, elaborating, and clarifying results.

Cresswell and Clark (2017) defined an embedded correlational design as a methodology in which qualitative data is embedded into a quantitative design, whereby the qualitative data is used to offer explanations for the findings in the correlational model. An embedded design is the most suitable approach to this thesis due to the research questions. The first two phases of the research conducted in this thesis has been quantitative with the latent interaction structural equation modelling (LI-SEM) between the behaviours associated with ADHD, Autism and attachment irregularities and the academic self-concept and general self-esteem being the largest study conducted. The third qualitative study conducted was informed by the findings from the LI-SEM project, with the findings providing a complementary data set enriching the quantitative data with potential explanations and further insight.

However, it can be difficult to integrate the results from both the quantitative and qualitative research conducted in an embedded design (Cresswell & Clark, 2017). To overcome this the teachers interviewed in the qualitative phase of this thesis were specifically asked about the behaviours associated with ADHD, Autism and attachment irregularities that were tested in the quantitative phase of the thesis. As highlighted earlier, one of the assumptions of this thesis was that the social construction of school influences interpretation of these behaviours and the context influences teacher management which has implications for self-concept. This assumption informed the testing of the behaviours and interviewing of the teachers.

The use of an embedded design allowed for a smaller qualitative study conducted at the end of this thesis to make inferences from the relationship between the behaviours associated with ADHD, Autism and attachment irregularities and self-concept. A smallerscale study was desirable due to the global COVID-19 pandemic occurring at the time of research. Social distancing measures were in place in the UK impacting the ability with which to conduct the interviews and also the resources available, as teachers were under great strain adapting to the 'new normal'.

To summarise, to answer the research questions outlined in Section 3.1 and explore the relationship between behaviours associated with ADHD, Autism, attachment irregularities, academic self-concept and general self-esteem with acknowledgement of context and teacher role a mixed-methods approach was required. The use of a mixedmethods approach required accepting and assimilating two dichotomous paradigms of research inquiry, being positivism and constructivism. The acknowledgement of the objective nature of manifest variables such as behaviour and the relationship of it to self-concept had to be explored from a quantitative lens, however, the exploration of the role of teacher perceptions of behaviour and subsequent management is much more socially constructed. Therefore, this dual slant was an acknowledgement of two distinct realities, the 'real' and the socially constructed which required both qualitative and quantitative methods of inquiry. The structure of the research required an embedded, mixed-methods design with the initial phase of the research forming the quantitative element to determine the relationship between the behaviours associated with ADHD, Autism and attachment irregularities and the academic self-concept and general self-esteem. The final phase was the embedded qualitative phase to interpret, contextualise and make inferences from the findings of the quantitative phase.

3.3 Methods

The method by which this thesis sought to answer the research questions identified in Section 3.1 involved three stages which are highlighted in Table 3 below.

Table 3.

Outlined Phases of Research

Phase	1
-------	---

Phase 3

Construct Validations

Latent-Interaction

Qualitative Interviews

Structural Equation

Modelling

The construct validations	The LI-SEM uses the	The qualitative interviews
take existing instruments	validated instruments from	conducted in phase three of
which measure ADHD	phase one of the research to	the PhD project illuminated
symptoms, Autistic traits	determine the relations	further the relations found in
and attachment	between ADHD behaviours,	phase two of the project
characteristics and	Autistic traits, attachment	exhibiting how teacher
sequentially edited and	characteristics and the	responses to student
validated them for use in	academic self-concept and	behaviours could influence
phase two of the research.	general self-esteem.	the academic self-concept
		and general self-esteem.

The first stage of the research project involved identifying and validating measures for the detection of behaviours associated with ADHD, Autism and attachment irregularities. The measures identified for editing and later use in the LI-SEM project were the adolescent attachment questionnaire (AAQ: West et al., 1998), the autism spectrum quotient (AQ-10: Allison et al., 2012) and the adult ADHD self-report scale (ASRS: Kessler et al., 2005). The first scale to be validated and tested was the AAQ (see Appendix V) with a sample of adolescents comprised entirely of secondary school students. The AQ-10 (see Appendix VI) and ASRS (see Appendix VII) were validated following this, concurrently using the same sample of adolescents gathered from sixth-form colleges, secondary school students and students from alternative education providers. These measures were then taken forward (see Appendix IX) into the second phase of the research which was a LI-SEM approach to exploring the relations between the behaviours and academic self-concept and general self-esteem. The third and final phase of the research was a qualitative exploration of teachers' perceptions of the impact of ADHD behaviours, Autistic and adverse attachment characteristics informed by the findings from phase two.

Ethical approval for all studies in this thesis was granted by the Liverpool John Moores University Research Ethics Committee (17-ELSBODF, 18/EDN/011, 18/EDN/013, 19/EDC/005 and 20/EDC) before starting data collection. The submission and approval documents can be found in the Appendix (Appendices I – IV). Data collection and management were conducted in line with the Liverpool John Moores University research ethics and governance guidelines and regulations.

3.4 Procedures

The procedures for each research project conducted during this doctoral thesis were distinct and as such will be discussed separately in chronological order in which the phases occurred. Therefore, the first procedure discussed will be that of the construct validations followed by the LI-SEM procedures and finally the qualitative study involving interviews with secondary school teachers.

3.4.1 Construct Validation Procedure

The construct validation projects conducted in phase one of this thesis involved a cognitive interview (see Appendix VIII) and confirmatory factor analysis. A small group of participants completed the cognitive interview exploring their interpretation of the items, followed by a larger sample completing the questionnaire for testing of factor structure via a confirmatory factor analysis. The cognitive interview aimed to check the participants' understanding and interpretation of the items in the instruments.

The researcher approached identified schools, alternative education providers and sixth-form colleges via email or telephone call to outline the projects and gauge interest. Secondary schools and sixth-form colleges that expressed an interest were emailed the information sheets and gatekeeper consent forms to sign and return should they agree to take part in the research. Following gatekeeper approval, the researcher attended the institution to invite adolescents to take part. Participants were asked to sign a consent form and given an information sheet to keep before taking part in the study and were fully debriefed upon its conclusion. For participants in the study sourced from secondary schools and alternative education providers, parental consent was also sought and obtained. Data collection for all studies was conducted during term time and the school day.

Cognitive interviews were completed on the education providers' premises with the audio from interviews recorded for later transcription and analysis using Karabenick et al,'s (2007) cognitive validity procedure. This has four basic concepts to be explored: item interpretation, coherent elaboration, answer choice and overall validity. Item interpretation was defined by Karabenick et al. (2007) as providing an acceptable interpretation of what the item means from the initial reading of the items. Coherent elaboration is defined as the reference of item interpretation to a participant's idiosyncratic experiences. The answer choice given by participants' should be reflective of the elaboration they provided and show an integration between both item interpretation and elaboration which results in a suitable and consistent answer. The overall validity is the participants' ability to suitably provide evidence of correct item interpretation, coherent elaboration regarding their interpretation and the answer choice.

Cognitive interviewing (or as referred to by Karabenick et al., 2007, as cognitive pretesting) has been defined as a "concurrent, verbal-probing technique or interviewing technique designed to elicit data from respondents about their cognitive processing of a

survey item" (pp. 141-142). Karabenick et al. (2007) suggested that a cognitive interview assesses the validity of individual items rather than the whole scale through quantitative analysis. Following the cognitive interview, the participants' responses are coded with ratings given on four dimensions (item interpretation, coherent elaboration, answer choice/congruency and overall validity). The cognitive interviews conducted were semi-structured in nature and utilised the example question prompts laid out in Karabenick et al. (2007), including questions such as "can you read that question out loud", "what does this word mean?" and "what do you think that question is trying to find out from you?".

Participants' answers to questions determining item interpretation, coherent elaboration, answer choice and overall validity were scored from 1-5 (incorrect/unsuitable – correct/suitable), by two raters. Raters read the interview transcripts independently, scoring each item's response on the four concepts outlined by Karabenick et al. (2007). Agreement/disagreement between raters was established via the creation of mean scores from raters which were then compared to determine the difference between them. Differences of < 1 were deemed to be suitable indications of agreement between raters. If participants failed to elaborate or provide enough information, additional prompts were used. These additional explorative prompts included questions such as 'can you reword that question so that it uses different words but is still asking the same thing?' and 'can you use that word in a different sentence?'. The process for determining inter-rater agreement was conducted by compiling the mean scores from rater one and two for each questionnaire item according to item interpretation, coherent elaboration, answer choice/congruency and overall validity. The difference between the mean scores for item interpretation, coherent elaboration, answer choice/congruency and overall validity between each rater was then compared.

Following the completion and analysis of the cognitive interviews, the larger samples were asked to complete the instruments validated. Data was handled solely by the research team. Questionnaires given to participants asked for basic demographic information, however, participants were not asked for any information that was immediately identifiable in a large population, such as a participant's name. Due to this participants were only able to withdraw from the study at the time or immediately after questionnaire completion as once the data was compiled together it would have been impossible to identify specific completed questionnaires out of the sample.

The hypothesised factor structure of the data collected from the completed instruments was tested through confirmatory factor analysis. Confirmatory factor analysis is a theory-driven analytic technique used to confirm or disconfirm a suspected theoretical relationship and/or structure within a data set (Schreiber et al., 2006). The confirmatory factor analysis was conducted using *MPlus* v.8 (Muthén & Muthén, 1998-2020) software. *MPlus* v.8 is software that reports not only goodness of fit indices for the fit between data and model, but also factor loadings for items onto the factors they are supposed to be measuring and the correlation between factors to determine discriminant validity. The confirmatory factor analysis of the AAQ (West et al., 1998) was the first instrument to be tested and was conducted using a sample gathered from a single secondary school in the North-West of England. The confirmatory factor analysis of the adapted AQ-10 (Allison et al., 2012) and ASRS (Kessler et al., 2005) were conducted simultaneously with sixth-form colleges approached to provide participants to complete the questionnaire. The questionnaire given to participants also included some basic demographic factors including their age, gender, ethnic heritage and subjects studied.

3.4.2 Latent Interaction Structural Equation Modeling Procedure

After establishing both the cognitive and construct validity of the AAQ (West et al., 1998) AQ-10 (Allison et al., 2012) and ASRS (Kessler et al., 2005) they were deemed suitable to be used in the LI-SEM of the relation between ADHD behaviours, Autistic traits

and attachment characteristics and the self-concept. Multiple sixth-form colleges were approached to take part in the LI-SEM project by the lead researcher via email or telephone contact. The named representative from the sixth-form college that liaised with the lead researcher received an information sheet via email and a consent form. The sixth-form colleges were given time to consider taking part. Once the sixth-form colleges had considered if they were happy to take part in the study, the researcher requested that the signed consent form be returned to themselves either by email or physically given to the researcher on the day of the study taking place.

The named representative from each sixth-form college contacted was a senior member of the Social Sciences Faculty. For the school and students to benefit from taking part in the project, data collection took part in a Social Science (psychology, sociology or philosophy) lesson to give students an insight into conducting research, therefore all students in the sample were studying either psychology, sociology, philosophy in addition to other subjects.

Data collection was carried out on the sixth-form college premises. Participants completed one questionnaire which contained the adapted and extended AAQ from chapter one, four social and communication items were taken from the adapted self-report AQ-10, the adapted short-form adolescent ASRS and the measures of academic self-concept and general self-esteem from the Self-Description Questionnaire III (SDQ III: Marsh et al., 1984).

The relations between ADHD behaviours, social and communicative Autistic traits, attachment characteristics and the self-concept was explored through the use of an LI-SEM to determine whether how the predictor variables (being the behaviours associated with ADHD, Autism and attachment irregularities) related to the outcome variables (being self-concept), including regressions and testing for interaction. Only two-way interactions were explored between the predictors, testing of three-way interactions would have been more difficult to determine the nature of the interaction taking place and would have required a larger sample size. To address the research questions highlighted in Section 3.1, the M*Plus* v.8 software (Muthén & Muthén, 1998-2020) was utilised to conduct the large-scale multiple regression and LI-SEM analysis. Following data collection, data were entered into SPSS to run demographic analysis including the calculation of means, SD, skewness, kurtosis and to determine the variation in the data that was due to differences between sixth-form colleges. This was done through the calculation of the interclass correlation coefficient (ρ_D). The M*Plus* v.8 software (Muthén & Muthén, 1998-2020) was then utilised to regress the predictor variables (being the behaviours) onto the outcome variables (being the academic self-concept and general self-esteem) and determine the presence of an interaction between the predictors.

The regression and interaction analysis required the construction of structural equation models using the *MPlus* v.8 software (Muthén & Muthén, 1998-2020. In addition to allowing the regression of the predictor variables (ADHD behaviours, social and communication traits of Autism and attachment characteristics) onto the outcome variable (the self-concept) and testing of an interaction between the predictors, this allowed an exploration of the fit between the collected and the theoretical models. Model fit was assessed through consultation of fit indices which were, the chi-squared statistic (χ^2) the root mean square error of approximation (RMSEA), the standardised root mean square residual (SRMR), the comparative fit index (CFI) and the Tucker Lewis index (TLI). In addition to the RMSEA, SRMR, CFI and TLI, information criterion such as the Akaike information criterion (AIC) and the Bayesian information criterion (aBIC) were consulted to aid in the assessment of model fit. Finally, the R^2 , log-likelihood scores (which will be interpreted between each model via the *D* score which is the difference between the log-likelihood

scores) and χ^2 (used to determine the significance of the difference between log-likelihood scores) were also used in the assessment of model fit.

The RMSEA and SRMR assess model fit through comparison of a posited model with a 'perfect' model to determine the difference. The CFI and TLI assess model fit through comparison of the proportion of improvement in model fit when comparing the hypothesised model to a less-restricted baseline model (Byrne, 2011; Xia & Yang, 2019). The AIC, aBIC, R^2 and the D are used in model selection with the AIC and aBIC considered to be information criterion and are predictive and parsimony corrected goodness of fit indices. This means that both the AIC and aBIC consider model complexity in the computation of model fit although the aBIC attaches a greater penalty to model complexity. Therefore, a lower value for both the AIC and aBIC is indicative of a better fitting, more parsimonious model. (Byrne, 2011). The R^2 is the coefficient of determination that demonstrates the amount of variance observed in the outcome variable that can be explained by the predictor variables (Miles, 2014), a greater score means that more of the variance in the outcome variable is explained by the predictor variables. The log-likelihood scores demonstrate the fit between model and data with a greater log-likelihood score indicative of a better fit between model and data. However, the log-likelihood scores will be interpreted with regards to the D statistic which is the difference between the log-likelihood scores. The *D* statistic will be interpreted through the χ^2 which demonstrates whether there is a significant difference between the log-likelihood scores of each model and therefore whether one model has a significant advantage in fit between model and data than the comparison model.

3.4.3 Qualitative Procedure

Following completion and analysis of the quantitative phases of this doctoral thesis, the final qualitative element was conducted to provide greater insight into the demonstrated relations between ADHD behaviours, Autistic traits, attachment characteristics and the academic self-concept and general self-esteem. The lead researcher initially contacted gatekeepers from identified schools to initiate contact with teachers in the school. Initial contact was established through an introductory email to introduce the research team and the nature of the project. The gatekeeper then forwarded the information sheet, consent form and brief introduction of the project to the potential participants.

Once potential participants had received the relevant information they were given time to consider and informed to contact the lead researcher should they have additional questions and if they wish to take part in the research project. After contact had been made between the participant and researcher a scheduled time to conduct the interview was arranged following receiving the signed consent form.

The qualitative study complemented and further illuminated the findings of the LI-SEM study. Therefore, as the self-concept is informed by feedback and teachers are the primary form of feedback in schools it made sense to determine what feedback teachers are giving to students who demonstrate these behaviours. This informed the identification of research questions that informed an interview schedule. This was designed to explore teachers' ideas of desirable student behaviour in addition to their interpretation and selfreported management of ADHD behaviours, Autistic traits and attachment characteristics in the class and the influence these had on the self-concept. The semi-structured format was chosen to allow for the ability to paraphrase or prompt if answers were insufficient, these were "can you tell me more about that" or "can you explain a little more", for example. Prompts were also given if teachers referenced school-specific interventions or policies that were unfamiliar or unknown to the interviewer to explain what these were. The interview was conducted online (see Appendix X for the interview schedule). During the time of data collection, the COVID-19 pandemic had resulted in enforced social distancing measures in the UK limiting opportunities for in-person interviews. This meant that the only suitable alternatives were through methods such as video-conferencing, telephone interviewing or messaging. However, given the nature of the cohort, many of the teachers were both digital natives and computer literate due to its widespread use both in everyday life and their profession. This resulted in the decision to conduct the interviews through a messaging format. WhatsApp was chosen as the primary medium due to its data encryption technology. Following the completion of the interviews, the transcripts of the conversations were analysed using thematic analysis.

3.5 Participants

Participants used throughout the quantitative research included secondary school students, sixth-form college students and secondary school teachers based in the North of England. Student participants were aged between 12 and 18 and met the World Health Organisation criteria for adolescence (World Health Organisation, 2014). The participant samples in each of the phases of this PhD were different and as such will be discussed separately. First, the participants who informed the cohort used in the construct validations will be discussed, then the participant cohort in the LI-SEM and finally the teachers used in the final phase. A brief table highlighting the participant information for each phase of the PhD project can be found below in Table 4.

Table 4.

Participant Information for Each Phase of the PhD Project

	Phase 1	Phase 2	Phase 3
Total Participants	303	564	12
Gender			
Male	126	118	1

Female	166	439	11
Other	0	4	0
Rather not Say	11	1	0
Ethnicity			
White	291	393	12
Asian	2	109	0
Black	0	26	0
Chinese	0	2	0
Dual Heritage	0	16	0
Other	7	14	0
Undisclosed	3	0	
Free School Meals	23	N/A	N/A
Schools/Sixth Forms	10	8	7
Approached			
Schools/Sixth Forms	8	5	5
Taking Part			
Success Rate	80%	62.5%	71.4%

3.5.1 Construct Validation Participants

The cognitive interviews on the three psychometric instruments validated in this doctoral thesis were conducted solely on secondary school or alternative education students aged between 12 and 16 years. The span of age ranges included in the cognitive interview elements was purposeful in order to accurately reflect the different stages of cognitive development and ensure that younger adolescents could understand the items while remaining appropriate for older adolescents.

. The confirmatory factor analysis elements of the construct validations were conducted on secondary school students (in the validation of the AAQ) and alternative education providers and sixth-form college students (in the validation of the AQ-10 and the ASRS). Participants collected from the sixth form colleges were at least 16 years of age and at most 18 years old, therefore meeting the World Health Organisation criteria for adolescence (World Health Organisation, 2014) and suitable for use in this research. To inform the estimation of sample size various assumptions were consulted including the work by Muthén and Muthén (2002) who suggested a minimum of 150 for a simple confirmatory factor analysis. However, Jackson (2003) posited an "N:q" rule whereby the estimation of sample size regards the consideration of the number of cases and the number of model parameters that require a statistical estimation. Kline (2015) suggested that a reasonable ratio of a sample size to parameters ratio would be 20:1, although a minimum acceptable sample size to parameter ratio would be 10:1. Kline's (2015) suggestions were considered throughout the quantitative studies conducted in this thesis and used to inform sample size requirements.

The construct validation of the AAQ (West et al., 1998) was the first instrument to be tested with participants sourced from a secondary school in the North-West of England that has previously collaborated with Liverpool John Moores University. The secondary school used in the validation of the AAQ (West et al., 1998) was the only school approached as they provided a large enough sample to be used for the construct validation. The confirmatory factor analysis sample comprised of 303 adolescents (male n = 126, female n = 166, undisclosed n = 11, white ethnicity n = 291, Asian ethnicity n = 2, other n = 7, undisclosed n = 3) aged 12-16 years (M = 13.00, SD = 1.51; free school meals n = 23 [used as a proxy for low income]) with eight of the pupils in the sample also taking part in the cognitive interview. There were 60 cases of missing data, which equated to 19.9% of missing values in the entire dataset (including demographic variables) with the percentage of missing data per variable ranging from 0.3% to 3.6%. A Little's test confirmed that the data were missing completely at random ($\chi^2 = 75.967$, p = .109). To allow for missing data, FIML was employed in MPlus v.8 (Muthén & Muthén, 1998-2020) in the analysis.

Following the construct validation of the AAQ (West et al., 1998) the AQ-10 (Allison et al., 2012) and ASRS (Kessler et al., 2005) were simultaneously validated using the same sample for both the cognitive interview and confirmatory factor analysis. Participants in the cognitive interview analysis of the AQ-10 (Allison et al., 2012) and ASRS (Kessler et al.,
2005) were 8 adolescents aged between 12 and 16 (male n = 7 female n = 1 white n = 8) and were collected from secondary schools and alternative education providers in the north-west of England. Three schools were approached via email to take part in the cognitive interviewing element of the construct validation and all accepted. Participants in the confirmatory factor analysis of the AQ-10 (Allison et al., 2012) and ASRS (Kessler et al., 2005) were 296 adolescents (male n = 63, female n = 229, other n = 2, prefer not to say n =1) of multiple ethnicities (white n = 200, Asian n = 59, black n = 16 other n = 9, Chinese n =1, dual heritage n = 8), aged 16-18 (M = 17.00, SD = .56) and collected from four sixth-form colleges in England who were approached through either introductory emails or phone calls with information sheets and consent forms sent to return should they wish to take part.

There were 46 cases of missing data in total (16.5%) from the confirmatory factor analysis of the AQ-10 (Allison et al., 2012). This included demographic data with the percentage of missing data per variable ranging between 0.7% to 1.7%. A Little's test confirmed that the data were missing completely at random ($\chi^2 = 47.631$, p = .327). There were nine cases (3%) of missing data collected from the ASRS (Kessler et al., 2005) including demographic variables with the percentage of missing data per variable ranging between 0% to 1.0%. A Little's test confirmed the data were missing completely at random ($\chi^2 = 13.933$, p = .176). As with the construct validation of the AAQ (West et al., 1998), the MLR estimator in M*Plus* v.8 (Muthén & Muthén, 1998-2020) was utilised for the management of missing data from both the AQ-10 (Allison et al., 2012) and ASRS (Kessler et al., 2005) construct validations.

3.5.2 Latent Interaction Structural Equation Modelling Participants

The LI-SEM study was conducted on sixth-form college students studying some form of social science. Calculation of sample size was conducted using suggestions from Muthén

and Muthén (2002) and Kline (2015). According to Muthén and Muthén (2002) and Kline (2015) for a simple confirmatory factor analysis, a suitable sample size would be a minimum of 150 participants. However, a sample size of 150 participants would not allow for interactions and as such Kline's (2015) suggestions of a participant to parameter ratio of 20:1 were aimed for. Therefore 600 participants in total were aimed for to allow for interactions.

Overall, there were 564 participants included in the study (male n = 118, female n = 439, other n = 4, prefer not to say n = 1, white ethnicity n = 393, Asian ethnicity n = 109, black n = 26, Chinese n = 2, dual heritage n = 16, other n = 14) aged 16-19 years (M = 17.00, SD = .60) Eight sixth-form colleges in Northern England were approached to take part. Of these eight sixth-form colleges, five agreed to take part. Sixth-form colleges were approached using introductory emails or phone calls and extended information sheets and consent forms to return should they wish to take part. Ethical approval for this research project was provided by the Liverpool John Moores University research ethics committee (19/EDC/005). Written consent to take part in the study was required by both the gatekeeper and participants.

There were 145 cases of missing data in the data set (39%) including data missing from the demographic variables. The missing data was primarily localised to the general selfesteem questionnaire (percentage of missing data from this section of the questionnaire ranges from 1.2% to 2.8%, compared to other elements of the questionnaire where the missing data per variable ranges from 0% to 1.1%). In the questionnaire administered to participants, this was the fourth page and last page on a double-sided two-sheet questionnaire. Therefore, it is likely the reason for mostly general self-esteem items being missed was due to participants either failing to turn over the page to complete the final section or fatigue from completion of the previous pages. Indeed, 1% of participants failed to complete any of the general self-esteem items and 4.65% failed to answer at least one question in the general selfesteem items located on page four of the questionnaire. The Little's test result was statistically significant ($\chi^2 = 1525.274$, p < .001), as it could not be assumed that the data was missing completely at random the data was treated as missing at random. However, as failure to complete the fourth page of the questionnaire is the likely reason for the significance of missing data full information maximum likelihood (FIML) estimation was used to allow for the missing data in M*Plus* v.8 (Muthén & Muthén, 1998-2020). It is important to note that the term "missing at random" is somewhat confusing as it implies that the reason for 'missingness' is random although this is not the case. Missing at random means that there has been a reason identified for the missing data (as opposed to missing completely at random, whereby there is no reason). This is therefore a contrast to how one would usually understand and interpret random in relation to missing data (Graham, 2009; Schafer & Graham, 2002).

3.5.3 Qualitative Participants

Participants in the final study conducted as part of this thesis were 12 secondary school teachers (male n = 1, female n = 11, white n = 12) collected using snowball sampling between teacher contacts. An initial teacher contact established through a previous connection with the researcher was approached to determine their interest in taking part and asked to disseminate the invitation and information sheet through their peer network. In total, the sample was comprised of teachers from five different secondary schools in the Yorkshire region. The teachers were approached to take part in the study using the researchers' existing connections. The use of secondary school teachers in the final phase of this PhD may initially present as incongruent due to the change in the institution from using sixth-form students in the LI-SEM study, it has been highlighted that the pedagogic practice in schools and sixth-forms is largely similar (as highlighted in Section 2.1) and as such secondary teacher classroom management practice would likely be very similar to sixth-form college teacher practice. Therefore, the change from sixth-form context to secondary school context presents no issue in this research. Furthermore, all of the students used in the LI-SEM study were aged

between 16-19 and as such had only recently left secondary education (in some cases this was a matter of months) and as such the lasting effects of secondary teacher feedback on the selfconcept would still be evident. Therefore, secondary school teachers were an appropriate target population.

A snowball sampling technique was used with participants in the study encouraged to promote the research project in their network with the lead research contact details passed from participant to prospective participants. Prospective participants interested in taking part were asked to contact the lead research to express interest in taking part. Written consent to take part in the study was required by the participants before taking part in the interview.

As the study was qualitative in nature the appropriate sample size was determined through consultation of past qualitative theory. Boddy (2016) presented a compelling argument explaining that the nature of qualitative research is to explore phenomena on a human level, therefore for a qualitative project the suitability of a sample depends on the data "rich-ness" with a sample size of even one being justifiable if the data was rich enough. However, as our sample is homogenous (all secondary school teachers from the UK education system) data saturation should occur around 12 participants according to Boddy (2016). Therefore, a total sample of 12 was aimed for.

3.6 Quantitative Study Measures

To answer the research questions outlined in Section 3.1, self-report instruments were needed to determine the presence of behaviours associated with ADHD, Autism and attachment discrepancies. As the behaviours the researcher sought to measure were evidence of clinical conditions, screening or diagnostic measures were identified to be the most appropriate measures despite focusing on the presence of symptoms. However, as highlighted in Section 1 there is no difference between symptoms and behaviour with behaviour only becoming a symptom at a certain level of severity.

Instruments required for use in this study needed to be free at the point of use (to be easily accessible instruments for use in practice), appropriately measure behaviours associated with ADHD, Autism and attachment irregularities in adolescents, be self-report in nature and demonstrate suitable psychometric properties including construct validity. From literature searches no currently available measures for Autism, ADHD or attachment irregularities met all of these criteria.

Due to the lack of suitable measures, existing measures were taken which could be edited to be suitable for the research. These edited constructs then required validation before use in testing the relationship between the identified behaviours and self-concept through the use of a LI-SEM. The measures identified for editing and later use in the LI-SEM project were the adolescent attachment questionnaire (AAQ [West et al., 1998]), the autism spectrum quotient (AQ-10 [Allison et al., 2012]) and the adult ADHD self-report scale (ASRS [Kessler et al., 2005]).

3.6.1 The Adolescent Attachment Questionnaire

The adolescent attachment questionnaire (AAQ) is an instrument designed to measure an adolescents' perception of the quality of their attachment to their primary caregiver (West et al., 1998). The AAQ was published in West et al. (1998) towards the end of the popularity in attachment research. The AAQ (West et al., 1998) was constructed a priori from theory with Bowlby's (1969, 1973, 1980) and Ainsworth's (1985; Ainsworth et al., 2015) theories on attachment patterns being the theoretical basis for the construction of the instrument. The AAQ contains nine items split into three subscales measuring perceived emotional availability of the attachment figure (availability), feelings of anger and distress directed towards the attachment figure (angry-distress) and the relationship with the attachment figure as an independent and autonomous individual (goal-corrected partnership).

Emotional availability has been identified as a key component in a healthy attachment pattern and a requirement for attachment to develop (Bowlby, 1973). The attachment figure must be perceived by the adolescent as available and willing to act responsively to their needs. Angry distress is the measurement of feelings of anger and distress towards the attachment figure that the adolescent may have due to their needs not being met (Bowlby, 1973). Feelings of anger and distress are a natural outcome if the attachment figure is perceived by the adolescent to be unavailable, unresponsive, or inaccessible. Finally, goalcorrected partnership is a sign of a developed attachment bond in which the child acknowledges and recognises the attachment figure as an autonomous individual with their own needs and persona (Bowlby, 1973; Marvin, 1977). The goal-corrected partnership subscale of the AAQ is designed to measure this through the extent to which the individual considers the attachment figures' thoughts and feelings and empathises with these.

At the time of the AAQ's construction, West et al. (1998) identified three other adolescent self-report measures. These were the parental bonding instrument (Parker et al., 1979), the inventory of parent and peer attachment (Armsden & Greenberg, 1987) and the parental relationship questionnaire (Kenny, 1987). However, all of these were not correspondent to the adult attention interview (AAI: George et al., 1984-1996). It was important for an instrument measuring attachment to correspond to the AAI as it was considered to be the gold standard method for assessing attachment behaviours at the time. This was due to considerable evidence of validity (Bakermans-Kranenburg & Van Ijzendoorn, 1993; Sagi et al., 1994; Crowell et al., 1996), and concordance between Ainsworth's strange situation attachment classifications and the AAI's classifications (Ainsworth & Eichberg, 1991). In addition, the AAI has been used with adolescents and adults (Beijersbergen et al.2008). However, as with most interview-based assessments, the procedure was costly and time-consuming to complete. Therefore, a clear need was identified to create a self-report measure that corresponded with the gold standard method to reduce the time and resources required to assess attachment.

Following the construction, West et al. (1998) tested different forms of validity with the instrument and later research tested the AAQ further. In the original research and construction, West et al. (1998) tested convergent validity with the AAI (George et al., 1996). It was found that AAQ subscale scores converged significantly with AAI classifications with *t* scores demonstrating substantially different mean scores between participants of certain classifications and all other participants. For example, secure classifications had significantly different availability scores (t = 2.21 p = .031) than preoccupied classifications and dismissing classifications which, in turn, had significantly different angry distress (t = -2.61, p = .011) and goal-corrected partnership scores (t = -2.65 p = .01) respectively. The use of a *t*-test in the analysis was conducted to determine how different the AAQ (West et al., 1998) classifications were from those found in the AAI (George et al., 1996) which was considered to be the gold standard method of attachment assessment at the time. The significant scores demonstrated convergent validity with the AAI (George et al., 1996).

West et al. (1998) also explored the internal consistency of the measure during its construction, Cronbach's α scores demonstrated reasonable to good internal consistency across the three subscales of the AAQ (angry distress $\alpha = .62$, availability $\alpha = .80$, and goal-corrected partnership $\alpha = .74$). Test-retest reliability across a three-month period was also good (angry-distress r = .68 availability r = .73 and goal-corrected partnership r = .72).

Studies using the AAQ have been reviewed in an article by Wilson and Wilkinson (2012) who highlighted the extensive validation that was conducted by West et al. (1998) in

the original construction of the metric. However, Wilson and Wilkinson (2012) highlighted that in research that has used the AAQ or explored its properties most authors reference West et al.'s (1998) protocol as the only form of validating evidence. Wilson and Wilkinson (2012) also referenced an original limitation of the AAQ highlighted by West et al. (1998) in that the AAQ cannot be used to categorise adolescents into attachment types, only to assess the perceived security of their relationship. Wilson and Wilkinson (2012) speculated that this limitation may be the reason why the AAQ is not frequently employed in the literature, as it does not allow categorisation of adolescents into attachment styles (or types).

A further review conducted by Jewell et al. (2019) built upon the critique by Wilson and Wilkinson (2012) and concluded that the AAQ (West et al., 1998) was a brief measure with structural validity as judged by the Consensus-Based Standards for the Selection of Health Measurement Instruments (COSMIN) criteria (Jewell et al., 2019). COSMIN is a framework designed by leading researchers to outline recommended and suitable properties of psychometric instruments for use in clinical and research practice (COSMIN, 2021). In 2017 the AAQ was further validated as an appropriate construct for the measurement of angry-distress, availability and goal corrected partnership in attachment by Sochos and Lokshum (2017). The authors tested the questionnaire on a sample of 279 Nepali adolescents. The goodness of fit indices from Sochos and Lokshum's (2017) support the theoretical threefactor model suggested by West et al. (1998) and suggested an almost perfect fit between model and data (CFI = 1, IFI = 1, NFI = .97; RMSEA = .00). The normed fit index (NFI) was an early fit index created before the CFI, like the CFI however it compares a tested model against a null model where the variables are uncorrelated (Smith & McMillan, 2001).

Despite the aforementioned criticisms, the AAQ (West et al., 1998) has been shown to have a sound theoretical basis and empirical support it was judged to be a suitable measure of adolescent attachment for use in this thesis. However, before use in the construct validation, the measure was extended with the addition of an extra item to each factor being measured, resulting in twelve total items. The addition of an extra item per measure was done to determine if the measure could be improved by adding additional items or if any of the additional items could perform better than the original nine. The additional three items added were as follows:

- Angry-Distress: I get upset when my parent/guardian does not give me the support I need.
- Availability: My parent/guardian always makes sure my needs are met.
- Goal-Corrected Partnership: I think about my parent/guardian when I am apart from them.

These items were constructed through consultation of the original paper by West et al. (1998) and an exploration of the theoretical underpinning of the original nine items in the instrument as suggested by Bowlby (1969, 1973, 1980). Angry-distress aimed to measure feelings of anger and distress caused by the adolescents' perception of the attachment figure being unavailable or unresponsive to their needs. The items in the original measure appeared to approach this very covertly, so a more overt item exploring the reaction from the adolescent when support is not received was deemed to be a suitable item.

Availability was conceptualised by Bowlby (1973) as the perceived availability of the attachment figure by the adolescent/child to respond to the meeting of their needs. As with the items in the angry-distress scale, the exploration of perceived availability appears to be much more covert. Like with the new item for the angry-distress scale a more overt item was added to potentially explore this.

Goal-corrected partnership as defined by Bowlby (1973) and Marvin (1977) as the movement towards a relationship between the attachment figure and child/adolescent whereby the child/adolescent acknowledges the attachment figure as an individual, with their

own needs and empathises with this. The three original items in West et al.'s (1998) measure adequately explored the empathising nature of the goal-corrected partnership and acknowledgement of a functional relationship between the attachment figure and adolescent; however, the wider-reaching bond did not appear to be explored. Therefore, an item was added to determine the impact of this bond across space.

There were no changes to the wording of the original measure as constructed by West et al. (1998), the only change made before the construct validation was the addition of the new items. The availability and goal-corrected partnership elements of the questionnaire are reverse-scored. With the reverse scoring of the availability and goal-corrected partnership factors in the questionnaire, the overall interpretation would be that higher scores on the questionnaire are more indicative of attachment-related problems.

3.6.2 The Autism Spectrum Quotient 10

The Autism Spectrum Quotient short-form (AQ-10) was devised by Allison et al. (2012) and is a ten-item construct designed to measure autistic behaviours in adolescents. The construct was initially designed to be used by a professional or parent/carer and was adapted from the long-form 50 item version of the adolescent AQ (Baron-Cohen et al., 2006). This in turn was informed by the original adult Autism Spectrum Quotient (Baron-Cohen et al., 2001). The original adult AQ is a 50-item, self-report measure of adult autistic behaviours grouped into ten items measuring five different symptom domains (attention to detail, attention switching, imagination, communication and social interaction) in the triad of diagnosable Autistic symptoms (being issues with communication, behaviour and language).

The adult AQ-50 (Baron-Cohen et al., 2001) was found to demonstrate predictive validity through four participant subgroups completing the instrument. The first group was comprised of participants with a confirmed diagnosis of Asperger's syndrome or high functioning autism. The second group was comprised of controls. The third group was

comprised of Cambridge University students, and finally, the fourth group was comprised of mathematic Olympiad winners. It was found that those in group one (and a confirmed diagnosis) scored significantly higher than the control group. Cambridge students who studied mathematics or scientists and those in group four scored higher than the Cambridge humanities and social science students.

The adult AQ-50 (Baron-Cohen et al., 2001) has been consistently used in research in various countries such as in work by Autsin (2005), Wakabayashi et al. (2006) and Wheelwright et al. (2010) to name but a few. There has been substantial evidence demonstrated suggesting the AQ-50's suitability as a screening tool. For example, convergent validity has been demonstrated with the social responsiveness scale in a high-functioning sample (Armstrong & Larocci, 2013). Other research on the AQ-50 has demonstrated predictive validity, in a comparison between diagnosed Asperger's patients and controls, AQ-50 scores were able to differentiate between each group (t = -5.59, p < .001[Woodbury-Smith et al., 2005]).

Despite evidence demonstrating the AQ-50 has good psychometric properties, research on the AQ-50 factor structure has failed to support the theoretical five-factor structure suggested by Baron-Cohen et al. (2001). In research by Kloosterman et al. (2011) the original five-factor model was tested competitively against further models. These models included a four-factor model of socialness, patterns, understanding others/communication and imagination, (Stewart & Austin, 2009), a three-factor model of social-skills, details/patterns and communication/mind-reading (Austin, 2005) and a two-factor model of attention to detail and social interaction (Hoekstra et al., 2008). All models tested failed to show an adequate fit between model and data, which suggests that the instrument did not demonstrate adequate construct validity. In a later stage of the project, Kloosterman et al. (2011) conceptualised a different five-factor structure (social skills, communication/mind-reading, restricted/repetitive behaviours, imagination and attention to detail) and tested this with confirmatory factor analysis. The findings showed that 28 of the 50 items successfully loaded onto this different five-factor structure.

As highlighted above many models have been suggested and tried with the AQ-50 (Baron-Cohen et al., 2001). However, Lau and Kelly (2013) suggested a further five-factor model with 39 items. The five factors were sociability, social cognition, interest in patterns, narrow focus and resistance to change, and offered a profoundly different theoretical model to the original suggested by Baron-Cohen et al. (2001). Lau and Kelly tested this theoretical model in confirmatory factor analysis and found that the model demonstrated a good fit between model and data, good internal consistency and test-retest reliability. Thus, the items devised by Baron-Cohen et al. (2001) in the original instrument are of value and offer some predictive validity despite the original theoretical structure being unsuitable.

The adolescent long-form AQ-50 (Baron-Cohen et al., 2006) was the precursor to the AQ-10 (Allison et al., 2010) adapted for use in this thesis. The adolescent AQ-50 differs from the adult AQ-50 as it is designed to be completed by a carer/parent despite retaining the same structure. The adolescent AQ-50 was validated in much the same way as the adult AQ-50. The parents of three groups of participants (high functioning adolescents with ASD, low functioning adolescents and random adolescents in mainstream education) were asked to complete the AQ-50. Results found that there was no significant difference between high and low functioning adolescents' AQ scores, however, there was a significant difference between both clinical groups and the control group. This suggests that the adolescent AQ can successfully predict autistic behaviours in an adolescent population when compared to controls.

The adolescent AQ-10 (Allison et al., 2010) was devised out of a need to reduce the AQ instruments (for all demographics) to a short-form nature. This was done through children, adolescents and adults with ASD and a control group completing the respective versions of the AQ. The best performing ten items from each measure were then selected to be used in each instrument. For all scales, the best two items with the highest discrimination index were chosen for each subscale (the theoretical five-factor model suggested by Baron-Cohen et al. [2001] in the original adult measure). The short-form adolescent AQ-10 was found to demonstrate significant differences between the control group and the ASD group in scoring. Internal consistency was good for data collected from the measure (Cronbach's α = .89) and the short form version was strongly correlated with the long-form version (r = .95, p < .001). Overall, Allison et al. (2010) found that all short-form versions of the AQ demonstrate dinternal consistency and high test accuracy, with all short-form measures performing as well or better than their long-form counterparts.

The short-form AQ-10 (Allison et al., 2010) that has been revised for use in this study is used in clinical settings for the screening of autistic behaviours and is recommended by the National Institute for Health and Care Excellence (NICE: 2012). As mentioned previously, all of the short-form AQ-10s (for all demographics) are as good as or better than their long-form counterparts. The adult AQ-10 in particular has been shown to demonstrate high specificity (72%) in its predictive capability of screening for autism in further research (Sizoo et al., 2015).

However, the factorial validity of the adolescent AQ-10 and AQ-50 have not been tested. The adolescent AQ-50 (Baron-Cohen et al., 2006) and AQ-10 (Allison et al., 2010) both adopted the five-factor structure found in the original adult AQ-50 (Baron-Cohen et al., 2001) which was found to demonstrate an inadequate fit between model and data. Despite this inadequate fit between model and data, the adolescent measures have not undergone confirmatory factor analyses. Therefore, the theoretical models suggested by Baron-Cohen et al. could result in a suitable fit between model and data, especially given the changes in the items in the instruments from the adult instrument to the adolescent version.

The AQ-10 (Allison et al., 2010) was chosen for this study due to its short-form nature and predictive validity. There is some incongruence in the use of the adolescent AQ-10 for this thesis as the behaviour range recommended is 12-15 and the later study exploring the presence of these behaviours will be taking place in 16 to 18-year-olds. However, Baron-Cohen et al. (2006) conceptualised adults as 15+ whereas the World Health Organisation conceptualised adolescence as the period between 10 and 19 (World Health Organisation, 2014). Therefore, it was decided that the instrument that should be used is the adolescent AQ-10 as opposed to the adult version to maintain consistency of rationale.

The short-form AQ-10 for adolescents and adults (Allison et al., 2010) contained some differences. For example, the adolescent measure was designed to be completed by parents/carers whereas the adult measure was self-report. The questionnaire that was needed for this thesis was a self-report measure that lends itself to the adult AQ. However, in addition to this being contrary to how the researcher was conceptualising the participants in terms of development, there was a significant difference in items on the adult AQ and adolescent AQ. There have been no cognitive interviews undertaken in other research on either of the short-form AQs being considered. Therefore, it was decided to use the adolescent measure (and revise to a self-report) as the questions asked were thought to be more appropriate for an adolescent audience.

The AQ-10 (Allison et al., 2010) was the most revised instrument to be used in this thesis to be suitable for use in the large-scale moderation study later. Among the changes, the AQ-10 was adapted to self-report. Thus, all items were changed to use personal pronouns.

Furthermore, in the original instrument, scoring was done on a binary scale with a score of either zero or one. Items were constructed so some items were predictive of autism should a definitely or slightly agree be selected, and some items were predictive of autism should a slightly or definitely disagree be selected. For example, items one, five, eight and ten are supportive of autism so a selection of definitely or slightly agree would result in a score of one per item. Items two, three, four, six and seven were negatively slanted so a score of one would be given for a definitely or slightly disagree selection. Allison et al. (2012) recommended that a score of six or above would result in a referral for specialist assessment. For this study, this dichotomy of scoring would not have been suitable because it conceptualises Autistic traits as present/absent without allowing for a continuum of manifestation. Therefore, the scoring was reworked to be a Likert scale from 1-5 (strongly disagree – strongly agree), with negative items reverse-scored. This allows the autistic behaviours explored in the instrument to be measured on a continuum.

The changes made to the items before validation can be seen in Table 5.

Table 5.

	tient
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Item	Original	Adapted
1	S/he notices patterns in things all	I usually notice patterns in things
	the time	
2	S/he usually concentrates more on	I tend to focus on the whole picture
	the whole picture, rather than	rather than small details
	small details	

3	In a social group, s/he can easily	I can easily keep track of several
	keep track of several different	different conversations when I am in a
	people's conversations	group of people
4	If there is an interruption, s/he can	If I am interrupted in what I am doing, I
	switch back to what s/he was	can go back to it very quickly
	doing very quickly	
5	S/he frequently finds that s/he	I often struggle to keep a conversation
	does not know how to keep a	going
	conversation going	
6	S/he is good at social chit-chat.	I am mostly good at small talk in social
		situations
7	When s/he was younger, s/he used	When I was younger, I used to enjoy
	to enjoy playing games involving	playing games with other children that
	pretending with other children	involved pretending and make-believe
8	S/he finds it difficult to imagine	I find it difficult to imagine what it
	what it would be like to be	would be like to be someone else
	someone else	
9	S/he finds social situations easy	I generally find social situations easy
10	S/he finds it hard to make new	I normally find it hard to make new
	friends	friends

The reworking of the questionnaire to a self-report form somewhat reduces the function of the instrument to only apply to those individuals who are high functioning on the autistic spectrum. Individuals who are severely disabled and low-functioning would not have the ability to complete the AQ-10 accurately, due to inadequate levels of functioning. One could argue that if an individual is at the lower end of the autistic spectrum there actually

would not need to be any use for an individual to complete a self-report measure regardless. Baron-Cohen et al. (2001) themselves acknowledged that this was an existing limitation in the original instrument. Despite this, the construction of the original adult autism-spectrum quotient (AQ-50: Baron-Cohen et al., 2001) was done because there were no brief, selfadministered instruments for measuring autistic traits in adults with normal intelligence. As a final point, editing the adolescent AQ-10 (Allison et al., 2010) to be more suitable for older adolescents without conceptualising them as adults would make for a more inclusive screening tool that could perhaps be used in further research or clinical practice (following any appropriate validation).

3.6.3 The ADHD Self-Report Scale

The ASRS (Kessler et al., 2005) is comprised of 18 items split into two sections (A and B) with six items in each. Section A is reflective of ADHD symptomatology and is used in screening before diagnosis. Section B provides additional cues into the nature of the deficits experienced. The ASRS was designed for an adult audience and as such required editing before use in an adolescent population. In addition to the rewording of the items, contextual elements had to be changed to be reflective of an adolescent's life period. For example, the contextual framing of questions had to be changed from an occupational focus to an educational one.

The ASRS (Kessler et al., 2005) was constructed theoretically by a team of experts creating a pool of items that closely matched the 18 DSM-IV-TR criterion A ADHD symptoms (American Psychiatric Association, 2000). The items were refined further before testing with 18 items selected from the pool to map onto the symptoms in the DSM-IV. An additional 11 items were added to the draft instrument to span the symptoms not in the DSM-IV but regarded to be representative of adult manifestations of ADHD.

Following the testing of these items, the researchers used stepwise logistic regression to identify six items that could be used as a short-form screening tool (section A). The six items from the original eighteen that demonstrated the best area under the receiver operating characteristic curve (ROC) score were selected to be trialled as screening items. It was found that when completing the screening tool 68.7% of clinical cases scored in the highest stratum of this instrument with 74.8% of non-clinical cases scoring in the lowest stratum.

Kessler et al. (2007) explored the suitability of the six-item ASRS screening tool in a sample of 688 American health plan subscribers. The ASRS was found to have strong concordance with diagnosis, and an ability to accurately differentiate between cases and noncases. The ASRS has been used in various research trialling its use in predicting ADHD. For example, findings from a receiver operating characteristic curve (ROC) analysis evidenced that the measure consistently demonstrated good sensitivity (1.0), moderate to good specificity (.71), a positive predictive value of r = .52 and a negative predictive value of 1 (Hines et al., 2012). Sensitivity and specificity are the abilities that psychometric instruments have to correctly detect the presence of a phenomenon (sensitivity) and the absence of the same phenomena (specificity) respectively with greater values indicative of greater sensitivity and specificity (Lange & Lippa, 2017). Good sensitivity and specificity mean that the ASRS can successfully differentiate between true positives (that being the true presence of ADHD behaviours) and true negatives (being the absence of ADHD behaviours) while the predictive value refers to the probability that those who score positively/negatively on the ASRS actually have ADHD. A later version of the ASRS (v1.2) has been established for use with the DSM V (Ustun et al., 2017). The original ASRS calibrated for use with the DSM-IV had much narrower diagnostic criteria and did not allow for comorbidity with certain other conditions. The updated ASRS, like the original demonstrated good sensitivity (91.4%), specificity (96%) and a positive predictive value of 67.3%. However, despite the ASRS v1.2

offering a screening tool in line with updated diagnostic criteria, the original ASRS (Kessler et al., 2005) for the DSM-IV was chosen for use in this study. The original version of the ASRS was chosen over the DSM-V version of the instrument due to some of the items being inappropriate. For example, the final question of the ASRS v1.2 requires adults to state how often they rely on others to organise elements of their life. For an adolescent, this is possibly inappropriate for younger adolescents.

The validation of the ASRS (Kessler et al., 2005) for use as an adolescent screening tool for ADHD behaviours in this study involved the removal of section B of the ASRS. As section B did not have as much predictive validity as section A it was not deemed useful for the revised version. In addition to this, as this instrument would be used along with three other instruments there was a need to keep instruments brief so as not to over-burden participants in the LI-SEM study. Therefore, only the six items with the most concordance with ADHD symptomatology, specificity and sensitivity were adapted for an adolescent population and validated. Furthermore, the findings of Kessler et al.'s (2005) research found that the six-item screener outperformed the full ASRS in the detection of ADHD behaviours, therefore further justifying the rationale to use only section A in this thesis.

Following the decision to use only the six-item screening section of the adult ASRS (Kessler et al., 2005), these items were rephrased to be more suitable for an adolescent sample. The items in section A originally had more of an occupational or workplace contextual underpinning. For adolescents, this was largely unsuitable and as such the contextual framing was changed to that of education and schoolwork. The scoring of the ASRS was also changed before use. In the original ASRS by Kessler et al. (2005) certain boxes were shaded in both section A and section B, these were mostly "often" and "very often" with some "sometimes". Kessler et al. (2005) suggested that if individuals placed four or more marks in the shaded boxes in section A then further diagnostic assessment should be

conducted. This method was abandoned for use in this study with scoring instead being made into a Likert scale (as with the adaptation of the AQ-10 [Allison et al., 2012]), allowing for measurement of the ADHD behaviours on a continuum.

The changes made to the items can be seen in Table 6.

Table 6.

A Comparison of item changes in the Adult ADHD Self-Report Scale

Item	Original	Adapted
1	How often do you have trouble	How often do you have trouble finishing
	wrapping up the final details of a	schoolwork once all the most
	project once the challenging	challenging parts are done?
	parts have been done?	
2	How often do you have	How often do you have difficulty
	difficulty getting things in order	organising things when doing
	when you have to do a task that	schoolwork?
	requires organization?	
3	How often do you have	How often do you have problems
	problems remembering	remembering to do things?
	appointments or obligations?	
4	When you have a task that	When you have difficult school work to
	requires a lot of thought, how	do, how often do you avoid/delay
	often do you avoid or delay	starting?
	getting started?	

5	How often do you fidget or	How often do you fidget or squirm with
	squirm with your hands or feet	your hands or feet when you have to sit
	when you have to sit down for a	down for a long time?
	long time?	
6	How often do you feel overly	How often do you feel overly active and
	active and compelled to do	compelled to do things, like you were
	things, like you were driven by a	driven by a motor?
	motor?	

3.6.4 The Self-Description Questionnaire III

The self-description questionnaire III (SDQIII: Marsh & O'Neill, 1984) was the only instrument used in this thesis that did not require any editing or prior validation before use in the LI-SEM project. The SDQ III was designed as a questionnaire to measure overall selfconcept through the measurement of specific subscales. The areas of self-concept measured were mathematics, verbal, academic, problem-solving/creativity, physical ability/sports, physical appearance, relations with same-sex peers, relations with opposite-sex peers, relations with parents, religion/spirituality, honesty/reliability, emotional stability/security and general self-concept.

The SDQ III was created from the first Self-Description Questionnaire (SDQ: Marsh et al., 1984) which was a measure of preadolescent self-concept measuring three areas of academic self-concept and four areas of non-academic self-concept. In addition to the SDQ and SDQ III, Marsh also created an adolescent self-concept designed for middle adolescence (grades 7-10 in the Australian education system), referred to as the SDQ II (Marsh, 1992).

Thus, the SDQs ranging from the first to the third offer a set of comprehensive measures of self-concept from pre-adolescence to late-adolescence/early adulthood.

The SDQ III (Marsh et al., 1984) was constructed from the need to measure late adolescent self-concept as most self-concept questionnaires were designed for preadolescents or early adolescents. Younger populations generally have still developing verbal skills which can affect the interpretation of items in questionnaires and therefore the measurement of abstract concepts such as the self. However, an interesting point to note is that according to Shavelson's model (Shavelston et al., 1976) the self-concept becomes more distinct with age. This suggests a mutability to the self in our former years that makes measurement more temporary and possibly prone to inaccuracies. Other theories have drawn on the more concrete and stable nature of the self in emerging adulthood/late adolescence (Keltikangas-Järvinen, 1990) and as such, it is questionable why there was a limited number of measures for this period of development.

The first iteration of the SDQ III (Marsh et al., 1984) used the seven scales found in the first SDQ (Marsh et al., 1984) with some changes to how those scales appeared (such as the splitting of one scale in the SDQ into two scales in the SDQ III). The first iteration of the SDQ III contained 180 items representing the eleven facets of self-concept mentioned earlier. Marsh et al (1984) later added scales of religion/spirituality and honesty/reliability. The final iteration of the SDQ III before testing was comprised of thirteen facets of self-concept with 136 items measured on a Likert scale.

Marsh et al. (1984) based his work on self-concept from the Shavelson model when constructing the different SDQs (1984). The Shavelson model (Shavelson et al., 1976) depicts self-concept as a multi-dimensional construct with facets arranged hierarchically and becoming more distinct from each other with age. Marsh et al. (1984) rigorously validated the SDQ III during its construction. In Marsh et al.'s 1984 paper two studies were reported which aimed to show that the SDQ III measured "a consistent, distinct and theoretically defensible set of self-concept dimensions" (p. 156) and to "demonstrate that responses to the SDQ III form a logical pattern of relationships with relevant external criteria" (p. 156) through the use of construct validation.

The findings of the construct validation by Marsh et al. (1984) showed that factor loadings for each of the items on their target variable are consistently high (90% of loadings were above .50). Correlations among the 13 factors were small showing that the different facets of self-concept in the SDQ III are all distinct from each other. The confirmatory factor analysis showed that the data collected fit a 13-factor model (in line with the theoretical structure of the metric and the 13 self-concept facets being measured). In addition to Marsh et al.'s (1984) own validation procedure, further research by other academics has validated the instrument further with data showing that SDQ III (Marsh, 1984) has factorial validity regardless of the academic ability (Byrne, 1988b) or gender (Byrne, 1988a) of the students completing the questionnaire.

Due to the substantial and positive research evidence highlighting the SDQ III (Marsh, 1984) as a suitable tool for measuring the thirteen different facets of self-concept that Marsh et al. identified, it was decided that this metric was a highly suitable tool to use in the research project without any further changes being required. However, not all the subscales in the metric were important to the fundamental aim of the research, therefore specific scales were taken from the SDQ III (Marsh, 1984) to use.

Of the 13 scales, the scales for academic self-concept and general self-esteem were taken. This was because many of the subscales lacked any form of relationship with the overall aim of the research which was to explore the relationship between behaviours associated with ADHD, Autism and attachment irregularities and an individual's general and academic self-concept. Therefore, it was decided that the two most suitable subscales were the academic self-concept and general self-esteem.

3.7 Analysis

3.7.1 Construct Validation Analysis

Following the completion of the cognitive interviews in the construct validation projects, the recordings were transcribed and analysed before administration to sixth-form students for testing of the factor structure via confirmatory factor analysis. During the cognitive interview, Karabenick et al.'s (2007) suggested four concepts were explored to determine the understanding of the items by the participants. Two raters coded separate responses from the cognitive interviews with ratings being made on a Likert scale from 1-5 (incorrect/unsuitable – correct/suitable).

Correct interpretations of keywords were decided through comparison of participants' definitions with Oxford dictionary definitions, correct interpretations of the statement were decided through rater judgment of keyword interpretation and final overall interpretation. Evidence of coherent elaboration was decided through the justification participants gave for their interpretation. Their answer choice and justification provided greater insight into overall interpretation accuracy. Finally, overall validity was decided by the participants' performance on the other three explored dimensions.

After completion of the cognitive interview, confirmatory factor analyses were conducted to competitively test the hypothesised models of each instrument against other theoretical models. To establish model fit for each instrument, the root mean square error of approximation (RMSEA), standardised root mean square residual (SRMR), comparative fit index (CFI), Tucker Lewis index (TLI) and χ^2 were consulted. Indices that represent a good fit between model and data were suggested by Hu and Bentler (1999) to be RMSEA < .06, SRMR < .08, CFI > .95 and TLI > .95. All models were tested using the M*Plus* v.8 software (Múthen & Múthen, 1998-2011).

In the confirmatory factor analysis of the AAQ, the three-factor model of the original AAQ (West et al., 1998) was tested against one-factor, bifactor and higher-order models. The one-factor structure loaded all 12 items of the revised AAQ against a single attachment factor. The three-factor structure loaded the 12 items against the hypothesised three-factor model of the original AAQ, namely availability, goal-corrected partnership, and angry distress. The bifactor structure simultaneously tested the 12 items against a general attachment factor and three-factor structure. The higher-order factor structure tested whether the three-factor structure loaded onto a further higher-order structure (conceptualised as "attachment"). Finally, the twelve-item three-factor instrument was tested against the original nine-item three-factor instrument to determine if the addition of the three other items added any additional benefits to the fit between the model and data.

The confirmatory factor analysis of the AQ-10 sought to test the researchers' hypothesised one-factor model of the adapted self-report AQ-10 (Allison et al., 2012) against a five-factor two-item model and a one-factor correlated variances. The different factor structures sought to test the ten items of the AQ-10 (Allison et al., 2012) against different theoretical models of autism. The one-factor model aimed to test the factor loadings of all ten items against Autism as a singular construct and the five-factor two-item model sought to test the loadings of two items on five different factors (which was the hypothetical model of the original 50 item AQ-10) of autism.

The final confirmatory factor analysis conducted of the ASRS (Kessler et al., 2005) was limited somewhat by the small nature of the adolescent revised ASRS (Kessler et al., 2005). As the adolescent revised ASRS contained only six items taken from section A of the

original adult ASRS (Kessler et al., 2005) there is a limited number of models possible to be tested, in this case only a one-factor and two-factor model could be tested. A factor being measured by less than three items raises questions on the ability of those two items to appropriately measure the factor (Marsh et al., 2004).

Therefore, the confirmatory factor analysis aimed to compare the hypothesised twofactor structure of the original adult ASRS (inattention and hyperactive-impulse as two separate factors) to a one-factor and correlated item variance one-factor model. A one-factor correlated item variance model was tested due to substantial overlap in content in items in the instrument.

3.7.2 Latent Interaction Struttural Equation Modelling Analysis

The preliminary analysis in the LI-SEM study explored demographic and descriptive statistics and interclass correlation coefficients. M*Plus* v.8 (Muthén & Muthén, 1998-2020) was used to generate the overall measurement model comprise of all the concepts explored and for the latent variable interaction analysis. The initial measurement model tested the factor structures of each questionnaire used and determine that the theoretical models established in the prior validating research both in this thesis and by Marsh et al. (1984) for the SDQ III's validation held. The FIML estimator was used during the M*Plus* v.8 (Muthén & Muthén, 1998-2020) analysis to account for the missing data. The measurement model was assessed by a confirmatory factor analysis (which was also used to assess latent bivariate interactions).

Following the construction of the initial measurement model two further models were constructed, model one and model two. Model one explored whether the predictor variables regressed onto the outcome variables without an interaction variable present, and model two explored the interaction between the predictor variables and the outcome variables. The two models were then tested competitively through comparison of AIC and aBIC (for the parsimony of model) and R^2 , D and χ^2 were compared competitively to determine which model per combination of variables offered the most advantageous explanation for the relationship. The most parsimonious and advantageous models were accepted.

The LI-SEM allowed for the assessment of interactions (Marsh et al., 2004) between ADHD behaviours and attachment characteristics and social and communication Autistic traits, and social and communicative Autistic traits and attachment characteristics. The predictor variables tested include behaviours associated with ADHD (as a one-factor model), social and communication difficulties associated with Autism (as a one-factor model) and attachment incongruencies (as a three-factor model comprised of anger distress, availability, and goal-corrected partnership). Outcome variables were general self-esteem (a higher-order model comprised of positive and negative facets) and academic self-concept (a higher-order model comprised of cognitive and affective elements).

Covariates of gender (binary scored as 0 = male and 1 = female), age, and heritage (black, Asian, white and other) were included in the measurement and interaction models. The 'other' heritages category captured heritages that were not in the categories listed or did not present with a large enough representation in the sample to be a unique category – for example, Chinese participants. All undisclosed answers were treated as missing data.

Heritage was treated as a binomial categorical variable with each ethnic category measured recorded into a series of dummy variables (Asian, black and other which captured heritages which were not listed or did not have a sufficiently large sample to warrant a unique category) which were then binary coded (0 = absent/false or 1 = present/true). Separation of heritage allowed for differentiation between the relationship each specific heritage had with self-concept.

3.7.3 Thematic Analysis

Inductive, semantic thematic analysis was chosen to interpret and analyse the qualitative data gathered from the teachers in the last project conducted. Thematic analysis has been selected for use in this project due to it being one of "the most systematic and transparent forms" (Joffe, 2012) of qualitative work, it allows for the analysis to be in-depth and identify prevalent recurring themes in the work. Inductive thematic analysis is data-driven, whereby the researcher pulls themes and codes from the data without any analytic preconceptions, in contrast to deductive thematic analysis (Braun & Clarke, 2006). Furthermore, semantic thematic analysis focuses specifically on the explicit and surface-level meanings of the data, with no further inspection of anything beyond what the participant has stated. This differs from latent thematic analysis which explores potential underlying meanings (Braun & Clarke, 2006).

Conducting thematic analysis is a process through which qualitative data is scrutinised for the presence and emergence of themes that are present and consistent in the data, with themes being either latent or manifest in nature. Braun and Clarke (2006) conceptualised thematic analysis as a method in which a researcher can explore meaning in data.

Following the completion of the interviews, the transcripts were each read through to make initial interpretations, to identify interesting points and explore the transcript and significant elements. Transcripts were then reread for the researcher to familiarise themselves with the data. During the second read through initial codes were selected and noted for each transcript and compared between transcripts. These codes were then transformed into initial themes that captured the quality of what was found in the transcripts. These themes were revised in an iterative process of reading and review of the whole data set until the themes stabilised and no further revisions were needed.

Themes found in the transcripts from the interviews were related to the principal focus of the research and the previous quantitative research. All transcripts and questions were considered through the lens of a teacher's perception of behaviour in the classroom and considering their needs to perform their function well in that context.

3.8 Summary

This method and methodology section has outlined the studies conducted in this thesis and the ontological and epistemological stance with which all of these studies were conducted. A mixed-methods design from a critical realist stance was utilised to attempt to address the gap in understanding as to whether ADHD behaviours, attachment characteristics and Autistic traits (namely social and communication difficulties specifically) related to the self-concept and how these constructs related in tandem to the self-concept. Furthermore, this thesis aimed to explore themes in teacher interpretation and management of these behaviours to illuminate further potential reasons why these behaviours may relate to the self-concept. To do this three phases of research were conducted, in the first phase was the adaptation and construct validation of three instruments (the ASRS, AQ-10 and AAQ) designed to test for ADHD behaviours, Autistic traits and attachment characteristics.

Following the subsequent validation of the ASRS (Kessler et al., 2005), AQ-10 (Allison et al., 2012) and AAQ (West et al., 1998), a second project was undertaken which utilised LI-SEMs to determine how the behaviours associated with ADHD, Autistic traits and attachment characteristics were related to both the academic self-concept and general self-esteem of adolescents in UK sixth-form colleges.

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Finally, the last project undertaken was a qualitative phase involving semi-structured interviews with secondary school teachers to determine their cognitions on the impact and management of behaviours associated with ADHD, Autistic traits and attachment characteristics in the classroom. This was done to determine if the teachers' approach to behavioural management could explain the relations between ADHD behaviours, social and communicative traits of Autism, attachment characteristics and the students' academic self-concept and general self-esteem.

Chapter 4 - The Construct Validations

As explained in the method (Section 3.3), before the LI-SEM study could be conducted instruments were needed to detect the presence of ADHD behaviours, autistic traits and attachment characteristics. Existing measures had to be edited and validated due to no instruments existing that were suitable for the project. The validation of these instruments, while also their own specific projects are part of the method of the overall thesis as the validations were required before conducting the main project.

Therefore, the findings and discussion of these construct validations are reported in this chapter. This separation from other research is due to the findings of the construct validations having no relationship to the multiple regression/interaction research findings and discussion. Although the findings of these validations to some extent influence the method of the large-scale quantitative preceding them as will be explored later in this chapter.

First, the results of the construct validation (both cognitive interview and confirmatory factor analysis) of the AAQ (West et al., 1998) are reported. Second, the confirmatory factor analyses and cognitive interview results of the AQ-10 (Allison et al., 2012) are reported. Third, the results of the confirmatory factor analysis and the cognitive

interview for the construct validation of the ASRS (Kessler et al., 2005) are reported. Further details on the construct validation process including method, procedure and instrument introduction can be found in Sections 3.3 to 3.7.1.

4.1 Construct Validation of the Adolescent Attachment Questionnaire

The AAQ (West et al., 1998) is designed to measure adolescent attachment behaviours through a theoretical three-factor structure comprised of: perceived emotional availability (availability), feelings of anger and distress felt by the adolescent (angry-distress) and the relationship between the adolescent and attachment figure (goal-corrected partnership). The construct validation comprised of a two-phase process involving a cognitive interview and a confirmatory factor analysis (Section 3.1).

4.1.1 Cognitive Interviews

The purpose of the cognitive interviews was to determine that participants went through the appropriate cognitive functions when reading the items in the AAQ (West et al., 1998). The cognitive interview procedure was explained earlier in the method section of this thesis (Section 3.3 to 3.4.1). Participants were required to demonstrate perceiving the new information appropriately, processing it in the context of stored information and selecting a suitable response from the synthesis of new and stored information. Completing these cognitive functions will lead to items being interpreted as intended.

Table 7 reports the mean scores for the participants' interpretation of items, coherent elaboration, answer choice and the overall validity of their answers. Answers that were rated 3.5 or above indicated mostly accurate responses (scores of 3.49 or less represented less than the scale median and indicated a mostly or completely unsuitable answer) and were considered to be correct interpretations, demonstrate suitable elaboration, be a suitable answer or be a valid overall interpretation. Agreement between raters was generally excellent

with the score difference between raters one and two being < 1 (the procedure for determining rater agreement was outlined in Section 3.3).

Table 7.

Mean Scores in Cognitive Interviews of the AAQ, with Rater Agreement per Dimension

	Item Interpretation		Coherent Elaboration		Answer Choice			Overall Validity				
	Rater 1	Rater 2	Diff.	Rater 1	Rater 2	Diff.	Rater 1	Rater 2	Diff.	Rater 1	Rater 2	Diff.
Angry Distress												
I get annoyed at my parent/guardian because it	4.60	4.50	0.10	3.70	3.50	0.20	3.80	3.80	0.00	4.00	4.00	0.00
seems I have to demand his/her carding and support												
My parent/guardian only seems to notice me when I	4.60	4.30	0.30	3.50	3.50	0.00	3.80	3.70	0.10	3.70	3.70	0.00
am angry												
I often feel angry with my parent/guardian without	4.30	4.30	0.00	3.10	3.00	0.10	3.70	3.70	0.00	3.60	3.60	0.00
knowing why												
Availability												
I am confident that my parent/guardian will listen to	4.30	4.50	0.20	3.60	3.70	0.10	4.00	4.00	0.00	4.00	4.00	0.00
me												
I am confident that my parent/guardian will try to	4.50	4.50	0.00	4.10	4.10	0.00	4.10	3.70	0.40	4.00	4.00	0.00
understand my feelings												
I talk things over with my parent/guardian	4.60	4.70	0.10	4.10	4.20	0.10	4.30	4.30	0.00	4.60	4.50	0.10
Goal-Corrected Partnership												
I enjoy helping my parent/guardian whenever I can	4.80	4.70	0.10	3.80	3.80	0.00	3.70	3.70	0.00	4.00	4.00	0.00
I feel for my parent/guardian when he/she is upset	4.50	4.60	0.10	3.30	3.60	0.30	3.50	3.60	0.10	3.70	3.80	0.10
It makes me feel good to be able to do things for	4.50	5.00	0.50	4.30	4.30	0.00	4.10	4.00	0.10	4.20	4.20	0.00
my parent/guardian												

Note. Ratings of 1-3.49 coded as incorrect and 3.5 -5 as correct

4.1.2 Confirmatory Factor Analysis

The purpose of the confirmatory factor analysis was to determine the fit between items and the theoretical factors they were deemed to measure, with a better fit indicative of a suitable and representative item loading onto the target factor. In addition to this, the confirmatory factor analysis was conducted to test the fit between the data gathered from the AAQ (West et al., 1998) and the theoretical model of attachment it posited (Section 3.6.1).

Model fit indices are reported in Table 8. The three-factor model showed a good fit to the data that offered a substantial improvement on the one-factor, bifactor and higher-order models. This held for the original nine items also when considering the suggested cut-off values suggested by Hu and Bentler (1999; see Section 3.7).

The three-factor 12-item model was accepted as the final model despite both models having the same scores for the goodness of fit indices. The three-factor 12-item model was accepted over the nine-item three-factor model due to the improvement the 12-item model offered in internal consistency of data gathered from the angry-distress subscale (Cronbach's α angry distress = .62, availability = .80, and goal-corrected partnership = .74 [as referenced in Section 3.6.1]).

Table 9 shows the factor loadings for each item onto the dimension they aim to measure with all $\lambda > .40$. Items that were $\lambda < .35$ were deemed to be inadequate following guidance by Hair et al. (1998) who suggested that a $\lambda \ge .35$ is needed for a sample of 250 participants. This assumption was applied to all models tested in this research. A low factor-loading indicates that the item does not load well onto the concept it seeks to measure and therefore is not truly measuring the concept, but rather something else.

The low mean reported for angry-distress is expected as lower scores indicate fewer feelings of anger and distress, which would be the case in the majority of the sample without any attachment issues. Figures 3, 4, 5, and 6 reports the structural equation models for the

tested hypothesised models.

Table 8.

Confirmatory Factor Analysis Results of One-Factor, Bifactor and Three-Factor Models of Attachment

	χ^2	Df	RMSEA	SRMR	CFI	TLI
One-factor Bifactor Three-Factor (12 Item) Three-Factor	240.88* 247.11* 66.62 34.66	54 46 51 24	.10 .12 .03 .03	.10 .32 .04 .04	.75 .73 .98 .98	.70 .62 .97 .97
(9 Item) Higher Order	235.53*	52	.10	.38	.76	.69

Note. * Significant χ^2 (p < .001).

The scores of internal consistency demonstrate the reliability of the data gathered from each factor in the instrument (Cronbach's $\alpha \ge .70$, ω McDonald's $\ge .73$). Internal consistency scores suggest suitably reliable data gathered from this questionnaire. Factor loadings suggest that the items load well onto each factor measured. Overall, this indicates that the three-factor model of attachment is suitable.

Table 9.

Standardised Factor-Loadings, Correlations and Internal Reliability from the Three-Factor Attachment Model

Items	Angry-Distress	Availability	Goal-Corrected Partnership
I get annoyed at my parent/guardian because it seems I have to demand his/her	.77		
caring and support			
My parent/guardian only seems to notice me when I am angry	.77		
I enjoy helping my parent/guardian whenever I can			.58
I talk things over with my parent/guardian		.68	
I get upset when my parent/guardian does not give me the support I need*	.42		
It makes me feel good to be able to do things for my parent/guardian			.68
I am confident that my parent/guardian will listen to me		.86	
My parent/guardian always makes sure my needs are met*		.64	
I often feel angry with my parent/guardian without knowing why	.52		
I feel for my parent/guardian when he/she is upset			.65
I think about my parent/guardian when I am apart from them*			.65
I am confident that my parent/guardian will try to understand my feelings		.85	
Latent bivariate Correlations:			
Angry-Distress		50	19
Availability			.77
M	1.06	3.48	3.40
SD	0.96	0.77	0.65
Cronbach's α	.70	.83	.73
McDonald's ω	.73	.85	.74

Note. *Items added by authors.
Figure 3.

One-Factor Structural Model of Adolescent Attachment Behaviour



Figure 4.

Bifactor Structural Model of Adolescent Attachment Behaviour



Figure 5.

Three-Factor Structural Model of Adolescent Attachment Behaviour



Figure 6.

Higher-Order Structural Model of Adolescent Attachment Behaviour



4.1.3 Discussion

The original AAQ (West et al., 1998) was built from a theoretical framework as opposed to a data-driven approach. Research by psychologists such as Ainsworth (1985) and Bowlby (1973) was used to inform the theoretical three-factor structure of the AAQ and to create the questionnaire.

This research project attempted to comprehensively validate an extended variant of West et al.'s (1998) instrument to determine if it had cognitive and analytical/structural validity to be used as a measure of adolescent attachment behaviours in the 21st century and this thesis.

The results of the cognitive interviews showed a good understanding by the participants of the underlying meaning of the items and the meaning of the key constituent parts of each item. Most participants were able to interpret, understand and answer the items to a satisfactory level. However, there were some anomalies in answers that at first glance appeared to suggest a misunderstanding or lack of understanding. When exploring this further and considering the context of the answers given it became apparent that these incongruences were not reflective of poor understanding or errors in cognition and interpretation for nearly all cases.

Inter-rater reliability was not used as a measure of agreement between raters. Raters scored all items from one to five on each dimension for all participants, these were then added together to create mean scores. When analysing mean scores through SPSS Kappa scores were significantly different due to the mean scores being decimal in nature, even though the actual difference may have been < 1. An alternative method was tested whereby mean scores were fixed to whole numbers, however, this resulted in some rater scores being constant across all participants and as such a Kappa score would not generate. Therefore, the

most appropriate method of judging agreement between raters was determined to be a direct comparison between the mean scores. Comparison of these mean scores for the raters' interpretation demonstrates the difference between the two raters with the difference for all scores being < .5. Therefore, demonstrating excellent agreement between the two raters.

The three additional items added to the study were not tested in a cognitive interview. This was due to the items being added in an explanatory capacity to determine if they performed better than the original items in the questionnaire and added any other advantage to the instrument. The original nine items were tested through a cognitive interview as they had not been validated through this approach in the original project by West et al. (1998), much in the same way as the questionnaire was not validated through the use of confirmatory factor analysis.

The internal consistency of the AAQ was found to demonstrate good reliability of data gathered from the scale (Cronbach's $\alpha \ge .70$, McDonald's $\omega \ge .73$ across each dimension) and a slight improvement when compared to the original research by West et al. (1998). At the time of the construction of the instrument, alpha scores ranged from Cronbach's $\alpha = .62 - .80$ with angry-distress having the worst internal consistency of the three dimensions in the AAQ. This was replicated in the current study with the angry-distress scale having the lowest score of internal consistency in the factors in the instrument (Cronbach's $\alpha = .70$, McDonald's $\omega = .73$). Despite this, there is still a significant improvement from West et al.'s (1998) original findings of internal consistency in the angry-distress subscale.

The internal consistency of the AAQ's original three-factor nine-item model in this research was shown to be good and present a significant improvement on the original Cronbach's scores found by West et al. (1998 [anger-distress $\alpha = .69$, availability $\alpha = .81$, goal-corrected partnership $\alpha = .73$). When compared with the adapted three-factor 12 item

model the internal consistency of the adapted AAQ was improved across all three factors (anger-distress $\alpha = .70$, availability $\alpha = .83$, goal-corrected partnership $\alpha = .73$), despite two of the additional items having a worse factor loading than the original items in the instrument. Internal consistency for the instrument overall demonstrated satisfactory scores (Cronbach's $\alpha = .67$, McDonald's $\omega = .74$).

The confirmatory factor analysis showed that a one-factor, bifactor and higher-order model were not suitable models when using the extended AAQ. In line with the indices suggested by Hu and Bentler (1999) the score for the RMSEA, SRMR, CFI and TLI fell short of the required level to demonstrate a good fit between model and data for the one-factor, bifactor and higher-order models. In addition to this, the χ^2 scores for the one-factor, bifactor and higher-order models all were significant suggesting a significant difference between the data collected and the theoretical models tested.

However, the confirmatory factor analysis supported the theoretical three-factor model that West et al. (1998) used to build the original AAQ at its conception in 1998. The model results show a good fit between model and data. Around the time of the project, other research was being conducted to test the construct validity of the AAQ in a Nepalese sample (Sochos & Lokshum, 2017) as stated in an earlier chapter of the thesis. Sochos and Lokshum's research also tested the original three-factor structure of the instrument as created by West et al. (1998). Like this project, the findings demonstrated that the theoretical threefactor structure was a suitable model with a good fit between model and data (CFI = 1, IFI = 1, NFI = .97; RMSEA = .00; AIC = 82.48).

When comparing factor loadings of this study with the findings of Sochos and Lokshum's (2017) factor loadings the factor loadings found ranged from .37 - 1.52 with the construct validation on a UK sample ranging from .42 - .86. However, loadings from Sochos

and Lokshum's (2017) study were unstandardised, compared to the standardised loadings reported in this data. This explains the much higher loadings from the 2017 study than those found in this research.

The additional items added to the AAQ (West et al., 1998) generally performed worse than the original items suggested by West et al. (1998), although one item added performed better than one of the items in the original measure. The author added item in the goalcorrected partnership scale had a significantly improved factor loading than one of the original items as can be seen in Table 9. This suggests that future use of the AAQ would perhaps be better served by replacing the original item with the authors' additional item. However, the suitability of this item as a replacement would need to be confirmed in future validating research.

As the construct validation of the AAQ (West et al., 1998) demonstrated a good fit between model and data from both this research and other research on a different population it can be assumed that the instrument is a suitable measure of adolescent attachment patterns. Therefore, the AAQ (West et al., 1998) was accepted to be used in the later project measuring the presence of developmental behaviours in adolescents from a three-factor model of attachment.

However, the caveat with the acceptance of a three-factor structure means that it is impossible to say that the AAQ (West et al., 1998) is a measure of attachment because it is not. The researchers instead must acknowledge that the AAQ (West et al., 1998) is a suitable measure of adolescent attachment behaviours if attachment is considered to be a threedimensional concept. These three dimensions must be comprised of feelings of anger and distress, the perceived emotional availability and the goal-corrected partnership between the adolescent and the attachment figure. This caveat supports the original aim of the instrument, which was to measure attachment without classifying it into a specific typology (such as secure and insecureavoidant etc). The current structure and use of the extended AAQ allow instead for the researcher to make distinctions between whether the attachment pattern is healthy or unhealthy. Unhealthy attachment patterns measured on the AAQ are likely to show higher scores for angry-distress and lower scores for availability and goal-corrected partnership (before reverse scoring). Healthier scores are likely to show the reverse of this. Therefore, for use in this doctoral thesis, it becomes apparent that the extended AAQ is a suitable and internally consistent questionnaire for the measurement of adolescent attachment behaviours and to determine the impact of these on the academic self-concept and general self-esteem of adolescents in UK sixth-form colleges.

While this study has successfully demonstrated a suitable fit between model and data and therefore a form of construct validity, future research could potentially explore the predictive nature of the AAQ. This could be in determining issues with feelings of angerdistress, perceptions of emotional availability and adolescent-attachment figure relationships in specific attachment types outside of the typology described in the AAI (George et al., 1984-1996) which was already compared in West et al.'s (1998) original work. Furthermore, future research could also use the expanded AAQ to explore correlations and relationships between attachment and other mental health conditions to name but one potential covariate or additional predictor.

4.2 The Autism Spectrum Quotient Construct Validation

As introduced in Section 3.6.2, the AQ-10 (Allison et al., 2012) is a short-form measure completed by a professional to screen for autistic behaviours in adolescents. The AQ-10 (Allison et al., 2012) was created from an adult long-form measure (The AQ-50

[Baron-Cohen et al., 2001]) that comprised of five theoretical factors and fifty items (with ten items per factor). This long-form measure was eventually converted into an adolescent measure (Baron-Cohen et al., 2006) that was then further defined into the short-form screening tool by Allison et al. (2012). To use the AQ-10 (Allison et al., 2012) in this doctoral research required adjusting the instrument from third-party completion to self-report (for example, 's/he notices patterns in things all the time' to 'I notice patterns in things all the time'). The suitability of the instrument for use in research following these changes was conducted through the use of a cognitive interview and confirmatory factor analysis.

4.2.1 Cognitive Interviews

As referenced in Section 3.3 and 3.4.1, the cognitive interview aimed to determine that participants went through the appropriate cognitive functions when reading the adjusted self-report items in the AQ-10 (Allison et al., 2012) and interpreted them as intended (with acknowledgement of the change in the intended instrument sample).

Table 10 reports the mean scores for the participants' interpretation of items, elaboration, answer choice and overall validity of their answers. Answers given that were rated four or above were considered to be correct interpretations, demonstrate suitable elaboration, be a suitable answer or be a valid overall interpretation (as with the validation of the AAQ [West et al., 1998]). From the data presented below many of the mean scores given by raters were among high three to four. Therefore, these scores were accepted as suitable explanations and it is possible to conclude that participants were able to suitably interpret items found in the AQ-10.

Agreement between raters was good to excellent with the difference between all scores being < 1.

Table 10.

Mean Scores in Cognitive Interviews of the AQ-10, with Rater Agreement per Dimension

	Item Interpretation		Coherent Elaboration			Answer Choice			Overall Validity			
	Rater	Rater	Diff.	Rater	Rater	Diff.	Rater 1	Rater	Diff.	Rater 1	Rater	Diff.
	1	2		1	2			2			2	
Attention to Detail												
I usually notice patterns in things	4.13	4.38	0.25	3.50	3.63	0.13	4.00	4.00	0.00	4.00	4	0.00
I tend to focus on the whole picture rather than small	4.25	3.88	0.37	3.38	3.88	0.50	3.63	3.75	0.12	3.88	3.75	0.13
details												
Attention Switching												
I can easily keep track of several different	3.88	4.00	0.12	4.38	4.25	0.13	4.50	4.38	0.12	4.38	4.25	0.13
conversations when I am in a group of people												
If I am interrupted in what I am doing I can go back	3.88	3.88	0.00	4.38	4.13	0.25	4.50	4.00	0.50	4.13	4.13	0.00
to it very quickly												
Communication												
I often struggle to keep a conversation going	4.25	4.38	0.13	4.00	4.00	0.00	4.38	4.13	0.25	4.38	4.25	0.13
I am mostly good at small talk in social situations	3.50	3.75	0.25	3.25	3.38	0.13	3.13	3.25	0.12	3.25	3.38	0.13
Imagination												
When I was younger, I used to enjoy playing games	4.25	4.38	0.13	4.00	3.75	0.25	4.25	4.00	0.25	3.50	4.13	0.63
with other children that involved pretending and												
make-believe												
I find it difficult to imagine what it would be like to	4.13	4.13	0.00	3.75	3.75	0.00	3.88	3.88	0.00	3.75	3.75	0.00
be someone else												
Social												
I generally find social situations easy	4.00	3.75	0.25	3.88	3.75	0.13	4.00	3.75	0.25	4.00	3.75	0.25
I normally find it hard to make new friends	4.63	4.50	0.13	3.88	3.88	0.00	4.50	4.50	0.00	4.38	4.38	0.00

Note. Ratings of 1 - 3.49 coded as incorrect and 3.5 - 5 as correct.

4.2.2 Confirmatory Factor Analysis

Model fit indices are reported in Table 11. A one-factor and the five-factor model of Autism was tested. The one-factor model was tested as the original instrument sought to screen for Autism as a specific entity. The five-factor model of imagination, attention to detail, attention switching, social and communication (introduced in Section 3.6.2) was tested as this was the original model suggested by Baron-Cohen et al. (2001, 2006) in both the adult and adolescent long-form AQs (as referenced in Section 3.6.2). The five-factor model was found to show a good fit between model and data while the one-factor model was found to demonstrate a poor fit between model and data (Table 11). In addition to demonstrating a poor fit between model and data, the one-factor model had extremely poor factor loadings. Items failed to appropriately load onto Autism as a singular construct. Therefore, this model was rejected.

With the one-factor model rejected this left only the five-factor model as a potentially suitable model. Internal consistency scores for two factors in this model presented as extremely low, with both the "attention to detail" and "imagination" factors were found to have Cronbach's $\alpha < .07$ and McDonald's $\omega < .07$. Despite these issues with internal consistency in some factors, the goodness of fit indices shows a good fit between model and data for the five-factor model. However, the factor loadings reported in Table 12 show that many of the items did not load coherently onto their target factors. The attention to detail items and one item in imagination loaded onto their respective target factors λ 's < .30 (following Hair et al.'s [1998] guidance of $\lambda \ge .35$ for a sample of 250 participants).

Poorly loading items are considered to not accurately measure their target factor which reduces some factors (such as 'imagination') down to only being coherently measured by one item. It is not possible to measure a factor accurately or sufficiently with one item,

therefore, the five-factor model was also rejected.

Figures 7 and 8 report the structural equation models for the tested hypothesised models.

Table 11.

Confirmatory Factor Analysis Results of Models of Autistic Behaviour

	χ^2	Df	RMSEA	SRMR	CFI	TLI
One-Factor	82.97*	35	.06	.05	.89	.87
Five-Factor	39.26*	25	.04	.03	.97	.94

Note. * Significant χ^2 (*p* <.001).

Table 12.

Standardised Factor-Loadings, Correlations and Internal Consistency of the Five-Factor Model of Autistic Behaviour

Items	Attention to Detail	Attention Switching	Communication	Imagination	Social
I usually notice patterns in things	.17				
I tend to focus on the whole picture rather than small details	.17				
I can easily keep track of several different conversations when I am in a group of people		.85			
If I am interrupted in what I am doing I can go back to it very quickly		.40			
I often struggle to keep a conversation going			.69		
I am mostly good at small talk in social situations			.57		
When I was younger, I used to enjoy playing games with other children that involved pretending and make-believe				.52	
I find it difficult to imagine what it would be like to be someone else				.07	
I generally find social situations easy					.89
I normally find it hard to make new friends					.67
M	3.39	3.05	2.69	2.33	2.82
SD	0.59	0.24	0.09	0.51	0.18
Cronbach's a	0.05	0.51	0.56	0.07	0.75
McDonald's ω	0.05	0.51	0.56	0.07	0.75

Having rejected all hypothesised models, further exploration was done on the items in the instrument that appropriately loaded onto their target factor. Items 5 and 6 and 9 and 10 were suggested by Baron-Cohen et al. (2001, 2006) to load onto two target factors, social interaction and communication. The five-factor model tested confirmed that these two items loaded successfully onto their target factors. However, the five-factor model also showed a large correlation (r = .98) between the social interaction and communication factors (Cohen [2013] suggested that r > .50 are indicative of a large correlation).

There is a conceptual overlap between the social interaction and communication factors which could explain the high correlation. Due to the large correlation between the two factors and issues with attempting to measure factors with less than three items (due to less than three items risking misidentification of factors [Raubenheimer, 2004]), the four items were tested in a one-factor model of social and communication aspects.

These four items were found to successfully load onto one factor with an almost perfect fit between model and data ($\chi^2 = .61$, df = 2, RMSEA = .00, SRMR = .00, CFI = 1.00, TLI = 1.00). Measures of internal consistency for the social and communication factor suggested a good level of data reliability as can be seen in Table 13. (Cronbach's $\alpha > .70$, McDonald's $\omega > .70$).

Table 13.

Standardised Factor-Loadings and Correlations and Internal Reliability of the One-Factor Model of Social and Communication Aspects of Autism.

Items	Social and Communication
I often struggle to keep a conversation going	.69
I am mostly good at small talk in social situations	.57
I generally find social situations easy	.88

I normally find it hard to make new friends	.68
М	2.75
SD	0.14
Cronbach's α	0.79
McDonald's ω	0.80

Figure 7.

One-Factor Model of Autistic Behaviour



Figure 8.

Five-Factor (Two Item) Model of Autistic Behaviour



4.2.3 Discussion

The AQ-10 (Allison et al., 2012) was the most revised instrument used in this study due to changing the format from observed/third-party completion to self-report and the language changes in the items. Despite the changes, the cognitive interviews showed no issues in the interpretation of the items by participants. Therefore, it was appropriate to assume that the revised self-report AQ-10 (Allison et al., 2012) was suitable for further validation and exploration of factorial validity.

The confirmatory factor analysis showed some issues with all the hypothesised factor structures tested. Most importantly all models tested showed a significant difference between model and data (p < .05) suggesting that this questionnaire is not measuring autism as any of these theoretical factor structures. Of particular interest is the poor fit between model and data of the theoretical five-factor structure with two items per factor. Although this is not an ideal model due to the lack of items per factor (and therefore an inability to assume that the factors are being appropriately measured) the original AQ-50 (both adolescent and adult [Baron-Cohen et al., 2001; Baron-Cohen et al., 2006]) was comprised of five theoretical factors (related to the three-diagnostic symptomatology of Autism) with ten items in the measuring each of the five factors. From these ten items, the best two were picked and compiled into the AQ-10 (Allison et al., 2012) to create the short-form version. So theoretically, this model should have been appropriate.

When exploring this further we can see in the factor loadings and correlations that there are some specific faults with individual items and factors (shown in Tables 12-13). For example, both items in attentional to detail have low factor loadings, suggesting a problem with the factor as an overall construct in the AQ-10. In addition to the poor factor loadings of the items, the factor has extremely poor internal consistency (Cronbach's $\alpha = .05$, McDonald's $\omega = .05$).

Internal consistency of the overall measure was $\alpha > 0.6$ (Cronbach's $\alpha = .62$, and McDonald's $\omega = .63$) and presents a marked deterioration in the alpha scores from the original measure. Allison et al. (2012) report a Cronbach's $\alpha = .89$ and therefore good internal consistency for the original measure. Thus, the consistency of data gathered from the adapted measure was worse, which potentially has some explanations. However, the most likely explanation is that the item revision process accounted for the deterioration.

Allison et al. (2012) did not report internal consistency scores for each of the five theoretical domains suggested by Baron-Cohen et al. (2001). Although internal consistency scores were reported by Baron-Cohen et al. (2006) for the five-factor model in his original research on the long-form adolescent AQ-50. Internal consistency for each dimension demonstrated a marked improvement on the internal consistency scores found in this research. This could be due to the greater pool of items per factor and potential differences in the sample taking part in the questionnaire.

Other factors all have at least one acceptable performing item, for example, both attention switching and imagination have one item that performs well, with one item of attention switching loading onto the factor extremely well (.85). Despite one well-performing item in both attention switching and imagination, both factors had low scores of internal consistency ($\alpha/\omega = .51$ and $\alpha/\omega = .07$ respectively) and therefore a lack of reliable data garnered from these factors.

The poor fit between model and data for the AQ-10 (Allison et al., 2012) mimics previous research on the adult AQ-50 (Baron-Cohen et al., 2001), the original measure that was found to demonstrate a poor fit between the ten-item, five-factor model originally

specified by Baron-Cohen et al. (2001). However, while that instrument has been found to demonstrate a poor fit between model and data there are some considerations to this. Additional research has found that the 50-item measure did map onto other theoretical models (as referenced in Section 3.6.2 [Kloosterman et al., 2011]), thereby suggesting some congruence and coherence in the original items into mapping onto factors. A greater number of items in a factor can potentially reduce the fit between model and data due to discrepancies between items' wording and interpretation by participants. In addition to this, differences in how items will load onto factors will affect the overall goodness of fit (Marsh et al., 2004).

Previous research highlighting construct issues with the AQ-50 (Baron-Cohen et al., 2001) could not be generalised to the AQ-10 (Allison et al., 2012). This was due to differences between the instruments, such as the change in item direction (from self-report to a third party completing the instrument), and the reduction in the number of items in the questionnaire. Furthermore, the five-factor model posited by Baron-Cohen et al. (2001) in the adult measure has only been tested in the adult measure. Therefore, the five-factor model could have potentially worked for the adolescent measure.

As is the case with construct validations and heterogeneous samples, different studies and samples can find different models in the data. For example, in later research in this thesis, the factor structure of Marsh and O'Neil's SDQ 3 (1984) was tested with a higher-order factor structure found posing a contrast to the one-factor structure found by Marsh and O'Neill.

Overall, from the items in the revised self-report AQ-10 only four items presented with enough of a relationship to load onto one factor. Therefore, it was decided that the other six items would be discarded from inclusion in the LI-SEM project as there was no coherency in keeping the items in the questionnaire. However, with discarding the other six items there comes the acknowledgement that this research is no longer measuring behaviours associated with Autism. Although it is possible to say that the research is measuring abnormalities in social interaction and communication that are associated with autism, these questions could also pick up other potential social and communication difficulties outside of Autism. Therefore, this will be referred to instead as just social and communication difficulties. With the removal of the additional six items and the reduction of this instrument to only measuring social and communication difficulties, there is no longer the risk of conflating behaviours associated with ADHD with Autism, therefore interaction analyses were decided appropriate to conduct with ADHD and social and communication difficulties.

Despite some of the problems found in previous research and the previously mentioned reasons why it could not be assumed that these would persist in this thesis, there was not much choice of self-report instruments to screen for autistic behaviours. Other options such as the Gilliam Autism Rating Scale (Gilliam, 2013) require parental or teacher completion, in addition to this other scales such as the Autism Behaviour Checklist (Krug et al., 1993) were not free at the point of use and were long-form. To summarise there was no perfect measure for what was required, and the AQ-10 (Allison et al., 2012) was the closest to what was needed for use in the study.

In retrospect, the validation of an autistic screening tool should have selected a bigger measure to validate and refine, as this would have allowed the research to remove items with poor loadings without compromising the instrument. As explained, due to the construct validation showing issues with six items in the instrument these were removed and the ability of the instrument to measure autism as a concept was impacted. If the longer adolescent AQ-50 (Baron-Cohen et al., 2006) had been adapted and used there would have been a greater chance that the items could have mapped onto a concept due to the previous research

highlighting potential structures in the adult AQ-50 (Baron-Cohen et al., 2001). Although this is not a certain outcome, the adolescent AQ-50 (Baron-Cohen et al., 2006) like the AQ-10 (Allison et al., 2012) would also have required editing to be made self-report, which could affect potential factor models.

Ideal and future research could be a recreation of this exact study on the long-form adolescent AQ-50 (Baron-Cohen et al., 2006) as opposed to the short-form tool devised by Allison et al. (2010). Using the long-form instrument would still require an additional phase beforehand to test Baron-Cohen et al.'s suggested five-factor model on the adolescent instrument before use. Should the problems with the five-factor model persist in the adolescent long-form AQ as with the adult version, then other suggested models by Kloosterman et al. (2011), Stewart and Austin (2009) etc. would be needed to be tested before using the long-form questionnaire.

The validation and revision of this instrument presented the most issues in this thesis. However, these issues have been managed appropriately so as not to affect the overall quality of the data garnered from the study exploring the impact of developmental behaviours on academic self-concept and general self-esteem. Other future research on this measure could explore alternative avenues of construct validity, these include potential explorations of the predictive validity of the items and convergent validity with other scales designed to measure Autistic behaviours.

From this project, it is possible to conclude that the revision of the Allison et al. (2012) short-form construction of the AQ-50 for adolescents, does not have a five-factor structure, or any coherent structure that utilises all of the items in the instrument. Furthermore, it is possible to conclude that four items in the original instrument load coherently onto one factor and not just two factors. This suggests multicollinearity between the items and limited discriminant validity. Due to these considerations, only the four items that loaded coherently onto a one-factor model with sufficient goodness of fit statistics has been accepted. This model has been taken forward into the later research exploring the impact of behaviours on academic self-concept and general self-esteem. As previously stated, due to this we can no longer state that this thesis is exploring the impact of autistic behaviours. Instead, this thesis is now exploring the impact of social and communication deficits that can be associated with autism. This clarification is needed as the social and communication deficits may also be associated with speech and language disorders in addition to autism.

4.3 The Adult ADHD Self-Report Scale

The adult ADHD self-report scale (ASRS [Kessler et al., 2005]) is a brief self-report screening tool for the presence of ADHD symptoms in adults. The original instrument comprised of two sections, A and B. Section A was comprised of six items that had the best capability in predicting a diagnosis of ADHD following its use in clinical assessment (exploration of the nature and incidence of symptoms and impact on the individual's life) by a psychiatrist or other mental health professional. Section B was comprised of items that mapped onto additional elements of the DSM-IV criterion A symptoms of ADHD. However, these additional items did not meaningfully improve the strength of association between the six-item screening scale and diagnosis. Completion of the six-item screening tool demonstrated comparable predictive capability with completion of the full measure, therefore, there was no significant reason to validate and use section B in this research. (Kessler et al. 2005).

To use the ASRS with an adolescent sample, items were adjusted to be more suitable for adolescent use. Only section A was adjusted and taken for use in the construct validation. This was due to the items in section A having the best capability in predicting a diagnosis of ADHD (and therefore predicting the presence of ADHD behaviours).

Furthermore, as with the AAQ (West et al., 1998) and the AQ-10 (Allison et al., 2012), the ASRS was adapted for use in a later LI-SEM project exploring the relations between developmental behaviours and self-concept. This later study involved the completion of multiple questionnaires; therefore, it was important to keep item numbers to a minimum to reduce the participant burden when completing the multiple questionnaires in the later LI-SEM study.

Item changes include simplification and changing of the contextual underpinning of items from work to an education focus. This was to make the ASRS suitable for an adolescent sample (changes can be seen in Table 6 in Section 3.6.3). Failure to adjust the instrument would have resulted in the items being unrelatable to the adolescent population and therefore, likely to fail to appropriately measure ADHD behaviours.

4.3.1 Cognitive Interviews

As with both the construct validations of the AAQ (West et al., 1998) and the AQ-10 (Allison et al., 2012), a cognitive interview was conducted on the edited items from the ASRS.

Table 14 reports the mean scores for the participants' interpretation of items, elaboration, answer choice and overall validity of their answers. Answers given that were rated four or above were considered to be correct interpretations, demonstrate suitable elaboration, be a suitable answer or be a valid overall interpretation. Agreement between raters was good with rater scores being ≤ 1 .

Table 14.

Mean Scores in Cognitive Interviews of the ASRS, with Rater Agreement per Dimension

	Item Interpretation		Coherent		Answer Choice		oice	Overall Valie		dity		
				El	aboratic	n						
	Rater	Rater	Diff.	Rater	Rater	Diff.	Rater	Rater	Diff.	Rater	Rater	Diff.
	1	2		1	2		1	2		1	2	
ADHD												
How often do you have trouble finishing schoolwork once all the	4.25	4.25	0.00	3.62	3.62	0.00	4.00	3.50	0.50	4.12	3.62	0.50
challenging parts are done?												
How often do you have difficulty organising things when doing	4.00	4.12	0.12	4.12	3.50	0.62	4.12	3.87	0.25	4.12	3.75	0.37
schoolwork?												
How often do you have problems remembering to do things?	4.50	4.00	0.50	4.62	3.62	0.00	4.75	4.00	0.75	4.75	4.00	0.75
When you have difficult school work to do, how often do you	4.25	4.25	0.00	4.37	3.75	0.62	4.62	3.62	1.00	4.37	3.5	0.87
avoid/delay starting?												
How often do you fidget/squirm with your hands or feet when	4.50	4.00	0.50	4.37	3.87	0.50	4.37	3.87	0.50	4.37	3.87	0.50
you have to sit down for a long time?												
How often do you feel overly active and compelled to do things,	3.12	3.87	0.75	3.12	3.50	0.38	3.37	3.62	0.25	3.25	3.62	0.37
like you were driven by a motor?												

Note. Ratings of 1 - 3.4 coded as incorrect and 3.5 - 5 as correct.

4.3.2 Confirmatory Factor Analysis

Table 15 reports the model fit indices of the hypothesised models in the confirmatory factor analysis. A one-factor and two-factor model were tested initially from acknowledgement by Kessler et al. (2007) that the items in the ASRS can be captured in a one and two-factor model.

ADHD in the DSM-V (American Psychiatric Association, 2013) is categorised as one of three subtypes, the inattentive type, hyperactive-impulse and combined type. This suggests two factors in ADHD symptomatology, one for inattention and one for hyperactive-impulse. Past research has tested the factor structure of ADHD based on the DSM criteria with evidence of a general factor and three specific factors (inattention, verbal hyperactivity/impulsivity and motor hyperactivity/impulsivity [Gibbins et al., 2012]). Despite three factors being found, it demonstrates a clear theoretical distinction between inattentive and hyperactive/impulse factors. Thus, supporting Kessler et al.'s (2007) statement that ADHD can be conceptualised as both a one and two-factor model and demonstrating the need to test both a one-factor and two-factor model.

The original six-item one-factor model of ADHD demonstrated a poor fit between model and data (as referenced in Table 15) failing to meet Hu and Bentler's (1999) cut-off criteria. In addition to this, item six demonstrated an extremely poor factor loading onto ADHD, falling significantly below the $\lambda \ge .35$ cut-off value for factor loadings suggested by Hair, Tatham, Anderson and Black (1998).

The two-factor model of hyperactive-impulse and inattention demonstrated a good fit between model and data (presented in Table 15) successfully surpassing Hu and Bentler's (1999) cut-off criteria. However, item distribution between the two factors was uneven with the hyperactive-impulse factor containing only two items and thus having an insufficient number of items for measurement (Raubenheimer, 2004). Figures 9 and 10 report the structural equation models for the tested models.

Table 15.

Confirmatory Factor Analysis Results of One-Factor, Two-Factor and One-Factor Correlated Variance Models of ADHD Behaviours.

	X^2	df	RMSEA	SRMR	CFI	TLI
One-Factor (6 items)	40.19*	9	.10	.06	.85	.76
Two-Factor	9.10	8	.02	.02	.99	.99
One-Factor (5 items)	9.10	8	.02	.02	.99	.99
<i>Note.</i> * Significant χ^2 (<i>p</i> -	<.001).					

Given that the two-factor model was comprised of a factor that was not measured by an appropriate number of items, further exploration was done on the one-factor model. As item six had an extremely low loading onto the target factor, this item was removed, and the one-factor model was tested again following removal.

Removal of item six resulted in significantly improved goodness of fit indices and scores of internal consistency as reported in Table 16. The removal of item six was a necessary decision, the low factor loading indicated that the item was not successfully measuring ADHD as a concept and its inclusion in the instrument negatively impacted the fit between the model and data. Thus, as the one-factor five-item model met Hu and Bentler's (1999) cut-off criteria for the goodness of fit indices, in addition to demonstrating λ 's \geq .35 for all items, this model was accepted.

Scores of internal consistency for both one-factor model variations tested can be found in Tables 16 and 17. Cronbach's α and McDonald's ω scores of internal consistency did not meet the often cited > .70 cut-off criteria (Nunnally, 1978) for modest internal consistency (Cronbach's α = .64, McDonald's ω = .65) in both models (although the five-

item variation showed a slight improvement in internal consistency).

Table 16.

Standardised Factor-Loadings and Correlations from the One-Factor Model of ADHD

Items	ADHD
How often do you have trouble finishing schoolwork once all the challenging parts are done?	.46
How often do you have difficulty organising things when doing schoolwork?	.74
How often do you have problems remembering to do things?	.57
When you have difficult school work to do, how often do you avoid/delay starting?	.48
How often do you fidget/squirm with your hands or feet when you have to sit down for a long time?	.39
How often do you feel overly active and compelled to do things, like you were driven by a motor?	.19
M	3.13
SD	0.49
Cronbach's a	0.64
McDonald's ω	0.65

Table 17.

Standardised Factor-Loadings and Correlations from the One-Factor, Five-Item Model of

ADHD

Items	ADHD
How often do you have trouble finishing schoolwork once all the challenging parts are done?	.47
How often do you have difficulty organising things when doing schoolwork?	.76
How often do you have problems remembering to do things?	.57
When you have difficult school work to do, how often do you avoid/delay starting?	.48
How often do you fidget/squirm with your hands or feet when you have to sit down for a long time?	.36
M	3.19
SD	0.52
Cronbach's a	0.65
McDonald's ω	0.66

Figure 9.

One-Factor Structural Model of ADHD



Figure 10.

Two-Factor Structural Model of ADHD



4.3.3 Discussion

The adolescent ADHD self-report scale revised from the original adult ASRS (Kessler et al., 2005) is the smallest metric to be validated during this doctoral research project with only six items taken from the original to be adapted, validated and used in the final multiple regression study. However, the adapted adolescent ASRS also has the best fit between model and data of the three questionnaires validated with almost perfect scores for the goodness of fit indices (RMSEA = .00, SRMR = .01, CFI = 1.00, TLI = 1.04, $\chi^2 = 2.01$, p > .05). The one-factor correlated variance model shows that the adapted adolescent ASRS is a suitable tool for measuring the presence of behaviours associated with ADHD when considering ADHD as a singular entity.

Scores of internal consistency for the one-factor correlated variance model are lower than the previous scales validated in this thesis (Cronbach's α = .64, McDonald's ω = .65) and seems to fall below the often-cited cut-off value of .70. However, other research has explored the internal consistency of the adult version of the ASRS (Kessler et al., 2005) from which this adolescent scale has been derived. Cronbach's α scores of between .63 - .72 across three time periods have been found in other research for the six screening items (Kessler et al., 2007). According to Kessler et al. (2007) lower than usual scores of internal consistency are to be expected. This was due to the method by which the instrument was constructed. Stepwise logistic regression analysis was used to select items, whereby the least redundant set of items is chosen to maximise the prediction of ADHD diagnosis. This resulted in optimisation of item inconsistency which would result in lower estimates of internal consistency while maximising prediction of ADHD diagnosis.

As the editing of the ASRS in this study was fairly simple, only involving contextual reframing of items to school and education, Kessler et al.'s (2007) explanation for the

inconsistency in items will hold for the edited instrument also and explain the lower scores of internal consistency.

The factor loadings of some items appeared to show some issues with their loading onto their respective factors. Item six in particular appeared to show an extremely low loading onto ADHD in a single item model, correlated variance model. Therefore, the sixth item was removed from the instrument before the instrument was used in the final study of this thesis.

As stated previously, the models that could be explored through a confirmatory factor analysis of the adolescent ASRS was limited somewhat by the limited number of questions taken from the original measure to be validated. However, from the confirmatory factor analysis carried out it is apparent that a one-factor and two-factor model are not suitable theoretical models. In line with the guideline for suitable indices suggested by Hu and Bentler (1999) the RMSEA, SRMR, CFI and TLI do not fall in acceptable guidelines to suggest a good fit between model and data. Furthermore, the reported χ^2 results of the one-factor and two-factor models show that the data collected differ significantly from the theoretical models tested. However, the one-factor correlated variance model (with items 1, 2 and 4 correlated, and items 5-6 correlated (item 3 was not correlated with any other item) showed a significant improvement in the suitability of the model to data fit according to Hu and Bentler's (1999) suggestions. Finally, the reported χ^2 shows an insignificant result, thereby suggesting that the data did not differ significantly from the theoretical model tested.

A potential limitation of the study was the decision to adapt the ASRS v1.1 (Kessler et al., 2005) as opposed to the ASRS v1.2 which was created with the DSM-V updated criteria for comorbid manifestations in ADHD (Ustun et al., 2017). However, a comparison of the items between the ASRS v1.1 and 1.2 presents a significant contextual difference that made the ASRS v1.2 deemed unsuitable for an adolescent audience. For example, the final item of the ASRS v1.2 is "how often do you depend on others to keep your life in order and attend to details?", this item would not be suitable for younger adolescents as they may not be at a level of development where they are completely independent. While older adolescents were used in the validation of the questionnaires used in this thesis, creating an adolescent measure without acknowledgement of younger adolescents results in a measure for adults. Therefore, it was decided that the most suitable measure to adapt was the ASRS v1.1, as all items could easily be contextualised for the entire adolescent range.

In conclusion, the adapted adolescent ASRS is a suitable measure to use for the measurement of ADHD behaviours in an adolescent sample. The cognitive interview showed good understanding from the participants and the confirmatory factor analysis of the one-factor correlated variance model suggests that the questionnaire is measuring ADHD as a singular construct with a near-perfect fit of data to model. Therefore, the adapted adolescent ASRS is a suitable questionnaire to use in this doctoral thesis to determine the presence of behaviours that are synonymous with ADHD for use in the multiple regression and interaction study.

4.4 Construct Validations Summary

The construct validation projects conducted in phase one of this thesis before the LI-SEM study in phase two were mostly successful. The ASRS (Kessler et al., 2005) and the AAQ (West et al., 1998) were successfully validated following minimal changes. The exception to this is the construct validation of the AQ-10 (Allison et al., 2012) which required substantial changes in factor structure and item removal to be usable.

The construct validation of the AAQ (West et al., 1998) confirmed the three-factor structure theoretically posited during its initial construction. The twelve-item model has been accepted for use in the later multiple regression and interaction research due to the improvement in Cronbach's α and McDonald's ω scores from the original nine-item measure.

The ASRS (Kessler et al., 2005) was also successfully validated, with the construct validation finding a one-factor model, supporting Kessler et al.'s (2006) statement of much of the ADHD symptomatology able to be captured in a one-factor model. Scores of internal consistency remained stable despite the changes in item context from work to education and simplification of items from the original instrument.

All models tested during the validation of the AQ-10 (Allison et al., 2012) were rejected due to poor goodness of fit indices and low factor loadings resulting in an unusable instrument. Despite the overall questionnaire lacking coherency in factor structure, four items measuring social interaction and communication skills were able to be taken from the AQ-10 to be used in later analyses (this social and communication instrument will be referred to as the adapted AQ henceforward). These four items from the original two factors of social and communication were found to load onto one factor (social and communication aspects of Autism) with good goodness of fit indices and factor loadings to support this.
These four items have been taken forward with an acknowledgement that the adapted AQ is no longer measuring behaviours associated with Autism and is now solely measuring social and communication difficulties associated with Autism.

Chapter 5 - The Relations between ADHD Behaviours, Social and Communication Difficulties of Autism, Attachment Characteristics and the Academic Self-Concept and Self-Esteem of Adolescents in Sixth-Form Colleges

The fourth study conducted utilised all the adapted measures that were tested through cognitive interviews and confirmatory factor analyses previously. This study was the reason each questionnaire was adapted to determine the presence of behaviours associated with ADHD, social and communication difficulties and attachment behaviours in adolescents in sixth-form colleges.

Reported results include descriptive statistics, the goodness of fit indices, factor loadings from each instrument, moderation analyses and multiple regression.

5.1 Descriptive Statistics

Descriptive statistics for the predictor (ADHD behaviours, social and communication difficulties and attachment behaviours) and outcome variables (academic self-concept and general self-esteem) are reported in Table 18.

Table 18.

Descriptive Statistics for ADHD, Angry-Distress, Availability, Goal-Corrected Partnership, Social and Communication, Academic Self-Concept

and General Self-Esteem

	Range	Mean	SD	Skewness	Kurtosis
ADHD	5 - 50	14.83	3.05	0.02	0.12
Angry-Distress	3 - 20	9.45	3.02	0.54	0.05
Availability	4 - 20	8.75	3.51	0.80	0.23
Goal-Corrected Partnership	4 - 20	8.23	2.60	0.95	1.74
Social and Communication	4 - 20	10.98	3.57	0.29	-0.29
Academic Self-Concept	10 - 80	51.25	11.17	-0.35	0.05
General Self-Esteem	4 - 96	60.03	17.09	-0.25	-0.30

5.2 Measurement Model

Before exploring interactions between the predictor variables, a measurement model of ADHD behaviours, social and communication difficulties of Autism and attachment characteristics was created to test the factor structures established in the earlier construct validations (Sections 4.1, 4.2 and 4.3). As with the prior interpretations of the goodness of fit indices, scores were interpreted regarding Hu and Bentler's (1999) suggested cut-off scores.

The theoretical models of general self-esteem and academic self-concept were also tested in this model, as these had not been tested earlier in this thesis. The academic selfconcept and general self-esteem elements of the SDQ III (Marsh et al., 1984) were previously validated in other research (Marsh et al., 1984; Byrne, 1988a, 1988b; Marsh et al., 2005) and as such did not require validation before this project like the AAQ (West et al., 1998), AQ-10 (Alliston et al., 2010) and ASRS (Kessler et al., 2005). However, the factor structure of both the academic self-concept scale and the general self-esteem scale was tested with the sample used in this research for the establishment of the measurement model.

The expected one-factor model of both the general self-esteem and academic selfconcept scale of the SDQ III (Marsh et al., 1984) failed to show a good fit between model and data (general self-esteem: $\chi^2 = 1133.51$, df = 54, RMSEA = .18, SRMR = .07, CFI = .77, and TLI = .73; academic self-concept: $\chi^2 = 639.92$, df = 35, RMSEA = .17, SRMR = .09, CFI = .75, and TLI = .68,).

Alternative models were tested for both the general self-esteem and academic selfconcept questionnaires which provided some improvements to the goodness of fit indices, models tested include a bifactor model (general self-esteem; $\chi^2 = 668.32$, df = 43, RMSEA = .16, SRMR = .05, CFI = .87, TLI = .80), a two-factor model differentiating between positive and negatively worded items (academic self-concept; $\chi^2 = 173.34$, df = 15, RMSEA = .13, SRMR = .05, CFI = .93, TLI = .80) and models of item concept differentiation (general selfesteem; $\chi^2 = 1547.24$, df = 50, RMSEA = .23, SRMR = .34, CFI = .69, TLI = .59).

After testing these models, the factor structure of both the academic self-concept scale and general self-esteem scale were deemed to be higher order, correlated residual variance structures due to better goodness of fit scores (academic self-concept; $\chi^2 = 74.59$, df = 26, RMSEA = .05, SRMR = .02, CFI = .98, TLI = .96, general self-esteem; $\chi^2 = 148.18$, df = 47, RMSEA = .06, SRMR = .03, CFI = .97, TLI = .97).

The accepted academic self-concept model was comprised of lower-order cognitive and affective elements of academic self-concept loading onto a higher-order factor of academic self-concept with correlated residual variances. The wording of items in the scale was similar in some cases informing the decision to correlate the residual variance, for example, three of the items that showed similar wording were "I hate doing work for most academic subjects", "I enjoy doing work for most academic subjects" and "I have trouble with most academic subjects". These items present almost the same sentence except positively or negatively directed, thus the decision to correlate them.

The accepted model of the general self-esteem scale found in this confirmatory factor analysis was a higher-order model of self-esteem with correlated residual variance. As with the academic self-concept scale, the wording of items in the scale informed the decision to correlate the residual variance, for example, "overall, I have pretty positive feelings about myself" and "overall, I have pretty negative feelings of myself".

Lower-order factors were positive self-esteem and negative self-esteem (comprised of reverse-scored items in the instrument). However, the factor loading of the lower order negative general self-esteem factor onto the higher-order factor was $\lambda = 1.20$. Factor loadings of greater than one can be problematic because they can indicate multicollinearity in the data,

but this is not necessarily a problem (Jöreskog, 1999). Multicollinearity is where two or more predictor variables are highly linearly related. This can cause issues such as unstable standard errors scores.

In the present data, there was evidence of a high correlation between the lower order factors in the general self-esteem model (r = .85) which could have resulted in the negative self-esteem factor $\lambda > 1$. Differing sources cite different cut-off values for correlations to lead to multicollinearity, although the agreed is generally any correlation r > .80 (Vatcheva et al., 2016).

Although the correlation between the two lower-order factors was expected, attempts were made to avoid multicollinearity. A one-factor correlated residual variances model merging the lower-order factors was tested (in addition to the one-factor model without correlated residual variances referenced earlier) as an alternative to the higher-order model, however, goodness of fit indices failed to show a good fit between model and data ($\chi^2 = 576.97$, df = 48, RMSEA = .14, SRMR = .04, CFI = .89, TLI = .85).

Therefore, as the higher-order, correlated residual variances model was the only model to demonstrate a good fit between model and data this model was accepted despite the collinearity between the positive and negative self-esteem factors. Furthermore, as multicollinearity does not affect the overall fit or predictions gathered from the model (Vatcheva, et al., 2016), the higher-order model was deemed the best possible model to accept.

Table 19 demonstrates the fit indices for the theoretical measurement model comprised of all concepts explored (with and without covariates), ranging from the predictor to the outcome variables (ADHD, social and communication difficulties, attachment, academic self-concept and general self-esteem).

The measurement model for ADHD, social and communication difficulties, attachment, academic self-concept and general self-esteem demonstrated reasonable goodness of fit indices. Manifest covariates included in the LI-SEM are age (from 16-19), sex (binary scored [0 = male, 1 = female]) and ethnic heritage. Heritage was treated as a binomial categorical variable, each ethnic category was recoded into a series of dummy variables and coded as 0 = absent/false or 1 = present/true. Separation of heritage into a binomial categorical variable was required to explore whether specific heritages predicted academic self-concept or general self-esteem (the method and rationale for this were outlined previously in Section 3.7.2). Treating ethnicity as a polycategorical variable would not have allowed regressing of specific heritages onto the outcome variables.

Fit indices slightly improved following the inclusion of covariates into the measurement model (as referenced in Table 19).

Table 19.

Goodness of Fit Indices for Measurement Model of the Relations between Developmental Behaviours, Academic Self-Concept, and General Self-Esteem

	χ^2	df	RMSEA	SRMR	CFI	TLI
Measurement Model Measurement Model with Covariates	1735.48 1894.29	867 968	.04 .04	.05 .05	.91 .92	.90 .91

Note. χ^2 was significant.

Table 20 reports the bivariate correlations. Correlations show that ADHD behaviours, attachment behaviours and social and communication difficulties are negatively correlated with academic self-concept and general self-esteem (availability and goal-corrected partnership were reverse-scored, as referenced in Section 3.6.1). Therefore, higher scores are indicative of the presence of unhealthy attachment behaviours towards the adolescents'

attachment figure. This means perceived lower emotional availability of the figure towards the adolescent and a worse relationship between adolescent and attachment figure).

Furthermore, ADHD, the attachment dimensions and social and communication difficulties are significantly intercorrelated, supporting the notion of relatedness between these behaviours in an assumed neurotypical sample (as referenced in Section 1.1.2 and 2.3). This means that they occur together even when the individuals do not have a diagnosis of ADHD or attachment disorder.

Variance attributable to the school level was small with scores $\rho_I < .020$ (2%) across all models. Therefore, no multilevel modelling was conducted

Table 20.

Latent Bivariate Correlations Among Developmental Behaviours and Academic Self-Concept and General Self-Esteem

	1.	2.	3.	4.	5.	6.
ADHD	-					
Angry-Distress	.38***	-				
Availability	.40***	.83***	-			
(Reverse)						
Goal-Corrected	.31***	.48***	.60***	-		
Partnership						
(Reversed)						
Social and	.26***	.11*	.19**	.16**	-	
Communication						
Difficulties						
Academic Self-	61***	25***	27***	18***	14***	-
Concept						
General Self-	46***	34***	35***	21***	51***	.28***
Esteem						
Candan	< 001	022	050	205***	021	005
Gender	< .001	.022	059	205***	.021	005
Age	.008	.015	043	024	118**	.042
Heritage				0.0.4	0.40	0.40
Asian	029	.098*	.155**	086	040	042
Black	088	012	<.001	093	046	.004
Other	.011	030	.049	019	.036	.070

*. *p* < .05 **. *p* < .01. *** *p* < .001

Table 21, 22, 23, 24, and 25 reports the factor loadings and internal consistency of the factors measured in the second study (the LI-SEM study) from the measurement model established in the LI-SEM study. Factor loadings showed a good relationship between items and the factors they correspond to. Two items were removed from the measurement model of ADHD (one-factor model [item six removed]) and attachment (three-factor model [item four removed]) due to poor factor loadings.

The removal of the poor loading items from the ADHD and attachment instruments was a necessary change as these items failed to coherently load onto their target factors. Removal of poorly performing items has been recommended by Raubenheimer (2004) as a means of increasing the convergent validity of data gathered from an instrument. Furthermore, as the items did not load coherently onto their target factor, they were not measuring that factor successfully and as such offered no benefit to the instrument.

Table 21.

Standardised Factor-Loadings and Internal Consistency from the Measurement Model of ADHD

Construct/Items	М	SD	Factor	Cronbach's a	McDonald's ω
			Loadings		
ADHD				.66	.67
How often do you have trouble finishing schoolwork once all the most challenging	2.42	0.85	.47		
parts are done?					
How often do you have difficulty organising things when doing schoolwork?	2.89	1.05	.68		
How often do you have problems remembering to do things?	3.23	0.97	.59		
When you have difficult school work to do, how often do you avoid/delay starting?	3.67	1.03	.56		
How often do you fidget or squirm with your hands or feet when you have to sit	3.52	1.16	.37		
down for a long time?					

Table 22.

Standardised Factor-Loadings and Internal Consistency from the Measurement Model of Attachment Behaviours

Construct/Items	М	SD	Factor Loadings	Cronbach's a	McDonald's ω
Anger-Distress (Reverse Score)			Loudings	.63	.68
I get annoved at my parent/guardian because it seems I have to demand his/her caring	1.99	1.05	.80		.00
and support.					
My parent/guardian only seems to notice me when I am angry.	1.82	1.04	.75		
I often feel angry with my parent/guardian without knowing why.	2.59	1.20	.43		
Availability				.83	.83
I talk things over with my parent/guardian.	2.57	1.17	.62		
I am confident that my parent/guardian will listen to me.	2.12	1.11	.85		
My parent/guardian always makes sure my needs are met.	1.86	0.95	.70		
I am confident that my parent/guardian will try to understand my feelings.	2.21	1.09	.82		
Goal-Corrected Partnership				.75	.75
I enjoy helping my parent/guardian whenever I can.	2.27	0.78	.67		
It makes me feel good to be able to do things for my parent/guardian.	1.95	0.80	.73		
I feel for my parent/guardian when he/she is upset.	1.65	0.79	.65		
I think about my parent/guardian when I am apart from them.	2.38	1.02	.61		

Table 23.

Standardised Factor-Loadings and Internal Consistency from the Measurement Model of Social and Communication Behaviour

Construct/Items	М	SD	Factor	Cronbach's α	McDonald's ω
			Loadings		
Social and Communication				.79	.79
I often struggle to keep a conversation going.	2.62	1.12	.67		
I am mostly good at small talk in social situations.	2.80	1.10	.58		
I generally find social situations easy.	2.89	1.17	.83		
I normally find it hard to make new friends.	2.68	1.13	.69		

Table 24.

Standardised Factor-Loadings and Internal Consistency from the Measurement Model of Academic Self-Concept.

Construct/Items	М	SD	Factor Loadings	Cronbach's	McDonald's	McDonald's
Academic Self-Concept Affect				.84	.84	wii
I enjoy doing work for most academic subjects	4.76	1.61	.75			
I hate studying for many academic subjects	4.71	1.80	.56			
I like most academic subjects	5.16	1.49	.72			
I am not particularly interested in most academic	5.31	1.68	.61			
subjects						
I hate most academic subjects	5.74	1.65	.79			
Academic Self-Concept Cognition				.84	.85	
I have trouble with most academic subjects	5.36	1.58	.78			
I am good at most academic subjects	5.16	1.40	.81			
I learn quickly in most academic subjects	4.91	1.58	.67			
I get good marks in most academic subjects	5.16	1.47	.73			
I could never achieve academic honours, even if I	5.34	1.94	.51			
worked better						
Academic Self-Concept				.87	.87	.60
Academic Self-Concept Affect			.81			
Academic Self-Concept Cognition			.83			

Table 25.

Standardised Factor-Loadings and Internal Consistency from the Measurement Model of General Self-Esteem

Construct/Items	М	SD	Factor	Cronbach's	McDonald's	McDonald's
			Loadings	α	ω	ωH
General Self-Esteem Positive				.88	.88	
Overall, I have a lot of respect for myself	5.54	1.83	.66			
Overall. I am pretty accepting of myself	5.15	1.75	.79			
Overall, I have a lot of self-confidence	4.04	2.04	.72			
Overall, I have a very good self-concept	5.03	1.62	.70			
Overall, I have pretty positive feelings about myself	4.74	1.80	.88			
Overall, I do lots of things that are important	4.98	1.69	.60			
General Self-Esteem Negative				.88	.88	
Overall, I lack self-confidence	4.04	2.03	.69			
Overall, I do not have much respect for myself	5.78	1.84	.69			
Overall, nothing that I do is very important	5.34	1.83	.60			
Overall, I have a very poor self-concept	5.37	1.77	.78			
Overall, I have pretty negative feelings about myself	5.07	1.94	.86			
Overall, I am not very accepting of myself	5.31	2.00	.80			
General Self-Esteem				.93	.93	.63
General Self-Esteem Positive			.86			
General Self-Esteem Negative			.96			

5.3 The Relations between ADHD behaviours, Social and Communication Difficulties of Autism, Attachment Characteristics and the Academic Self-Concept and General Self-Esteem

Following establishing correlations between the predictor variables the factor loadings, model goodness of fit and interaction between predictors was explored using *MPlus*. This involved establishing multiple models with different combinations of the predictors (for example, pairing ADHD and angry-distress) with each outcome variable (such as academic self-concept). Two variations of this model were created, Model 1 (no interaction term) and Model 2 (interaction term included). The predictor variables and interaction terms in these models were then regressed onto the outcome variables.

The results of the LI-SEM analysis can be found in Tables 26 to 34. There were five predictor variables tested representing the three concepts explored (ADHD behaviour, Autistic behaviour and the three attachment factors; angry-distress, availability and goal-corrected partnership). These were tested in combination with other predictors in paired combinations (e.g., ADHD x angry-distress) to determine if there was an interaction between predictors in their relation to the outcome variables (Model 1 goodness of fit indices for all combinations of predictors and outcome variables are reported in Table 26).

Covariates (referenced in Section 3.7.2) were also included in the analysis to determine how they related to academic self-concept and general self-esteem. To determine the extent to which the predictors related to the outcome variables standardised beta scores (β) were consulted. Standardised beta scores show the extent to which the standard deviation changes for every one-point change in the predictor standard deviation.

Relative fit indices (such as the AIC, aBIC and D) were compared between Model 1 and 2 to determine which model offered the best fit between model and data and if Model 2 offered any advantage over Model 1 (demonstrated in Table 27). Guidelines on interpretation of AIC and aBIC state that the smaller score indicates a more optimal model (Lin, Huang & Weng, 2017). However, Burnham and Anderson (2002, 2004) suggested that AIC scores with a difference of ≤ 2 provide evidence that the model is as good as the best fitting model with the lower AIC score, therefore any change between AIC scores must be > 2 to indicate Model 2 held an advantage. The most optimal models according to AIC, aBIC and *D* scores were accepted.

In almost all cases Model 1 presented a more advantageous model than Model 2 according to AIC, aBIC and log-likelihood scores. For all predictor x outcome combinations tested log-likelihood scores indicated that there was no significant difference in model fit between Model 1 and Model 2 (as referenced in Table 27).

Despite the acceptance of Model 1 in all the model combinations tested, there was one significant interaction term found in the social and communication difficulties x goal-corrected partnership on general self-esteem model (Table 34). Model 2 (incorporating the interaction term) offered a marginally smaller AIC ($\Delta = -1.216$) and aBIC ($\Delta aBIC = -0.089$) and a higher R^2 ($\Delta R^2 = +0.017$) than Model 1 demonstrating a better fit between model and data (reported in Table 27).

Despite this slight advantage, the small difference between AIC scores in Model 1 and Model 2 did not meet Burnham and Anderson's (2002, 2004) criteria of an AIC score > 2 to suggest an advantage. Therefore, Model 2 offered no reasonable advantage in AIC score than Model 1 despite the apparent lower score.

Furthermore, Model 1 had a higher log-likelihood value than Model 2. A higher loglikelihood value indicates a better fit between model and data. In addition to this, *D* scores demonstrated that there was no significant difference in model fit between Model 1 and 2, and therefore no significant advantage in accepting Model 2 over Model 1 (D = 1.607, df = 1, p = .200).

In all cases, Model 1 demonstrated a reasonable to good fit between model and data and non-significant *D* scores. Therefore, Model 1 was accepted as the most appropriate model for all combinations of predictor x outcome variables. Therefore, all regression coefficients interpreted from the LI-SEM analysis henceforward will be from Model 1.

Table 26.

Goodness of Fit Indices for Model 1 Predictor and Outcome Variable Combinations

	RMSEA	SRMR	CFI	TLI	χ^2	df
General Self-Esteem:						
ADHD x Angry-Distress	.04	.06	.94	.93	503.17***	246
ADHD x Availability	.04	.07	.95	.94	528.11***	270
ADHD x Goal-Corrected Partnership	.04	.06	.94	.93	533.17***	270
ADHD x Social and Communication	.04	.06	.94	.93	547.57***	270
Angry-Distress x Social and Communication	.04	.05	.95	.94	469.26***	223
Availability x Social and Communication	.04	.06	.95	.94	494.50***	246
Goal-Corrected Partnership x Social and Communication	.04	.05	.94	.93	510.17***	246
Academic Self-Concept:						
ADHD x Angry-Distress	.04	.06	.91	.89	464.34***	200
ADHD x Availability	.04	.07	.92	.90	498.69***	222
ADHD x Goal-Corrected Partnership	.04	.05	.91	.89	493.85***	222
ADHD x Social and Communication	.04	.05	.93	.92	424.88***	222
Angry-Distress x Social and Communication	.03	.04	.96	.95	202.92***	179
Availability x Social and Communication	.03	.04	.96	.96	311.90***	200
Goal-Corrected Partnership x Social and Communication	.03	.04	.95	.94	341.72***	200

*** *p* <.001.

Table 27.

Model 1 and 2 Absolute Fit Indices Comparison

	Model 1				Model 2		Comparison of Model 1 and 2			nd 2
	AIC	aBIC	R^2	AIC	aBIC	R^2	D	ΔΑΙϹ	∆aBIC	ΔR^2
General Self-Esteem:										
ADHD x Angry-Distress	33500.772	33595.390	0.304	33502.696	33598.439	0.303	0.002	+1.924	+3.049	-0.001
ADHD x Availability	34497.492	34595.489	0.313	34499.278	34598.401	0.315	1.317	+1.786	+2.912	+0.002
ADHD x Goal-Corrected Partnership	33893.663	33991.659	0.298	33895.666	33994.789	0.298	0.049	+2.003	+3.130	0.000
ADHD x Social and Communication	34913.301	35011.297	0.431	34914.203	35013.325	0.410	0.818	+0.902	+2.028	-0.021
Angry-Distress x Social and Communication	32081.636	32429.999	0.393	32082.894	32435.558	0.396	0.371	+1.258	+5.559	+0.003
Availability x Social and Communication	33082.617	33443.884	0.390	33082.704	33448.271	0.398	0.957	+0.087	+4.387	+0.008
Goal-Corrected Partnership x Social and Communication	32486.823	32581.440	0.355	32485.607	32581.351	0.372	1.607	-1.216	-0.089	+0.017
Academic Self-Concept:										
ADHD x Angry-Distress	30258.693	30347.678	0.309	30259.807	30349.918	0.313	1.157	+1.114	+2.240	+0.004
ADHD x Availability	31270.092	31362.456	0.303	31270.996	31364.487	0.307	0.008	+0.904	+2.031	+0.004
ADHD x Goal-Corrected Partnership	30631.767	30724.131	0.315	30630.787	30724.277	0.325	2.302	-0.980	-0.146	+0.010
ADHD x Social and Communication	31745.562	31837.927	0.321	31747.556	31841.047	0.327	1.927	+1.994	+3.120	+0.006
Angry-Distress x Social and Communication	28990.251	29317.111	0.077	28992.067	29323.227	0.077	0.093	+1.816	+6.116	0.000
Availability x Social and Communication	29997.402	30337.164	0.084	29999.374	30343.437	0.085	0.014	+1.972	+6.273	+0.001
Goal-Corrected Partnership x Social and Communication	29369.445	29709.207	0.061	29371.411	29715.474	0.062	0.017	+1.966	+6.267	+0.001

Note. All *D* scores were non-significant at 1df (*ps* >.05)

Table 28.

Model 1 and 2 Standardised Coefficients for the Moderating Role of ADHD and Angry Distress on Academic Self Concept and General Self-

Esteem.

	Model 1 (No I	Model 2 (In	teraction)		
	Standardised C	Coefficients	Standardised Coefficients		
	β	SE	β	SE	
General Self-Esteem:					
ADHD	-0.457***	.051	-0.455***	.052	
Angry-Distress	-0.258***	.050	-0.257***	.050	
ADHD x Angry-Distress	-	-	-0.011	.050	
Demographic Covariates:					
Gender	-0.164***	.042	-0.163***	.042	
Age	0.071	.044	0.071	.044	
Asian	0.160***	.048	0.162**	.048	
Black	0.071	.048	0.073	.048	
Other	0.053	.039	0.052	.039	
Academic Self-Concept:					
ADHD	-0.384***	.103	-0.512***	.050	
Angry-Distress	-0.083	.060	-0.098	.059	
ADHD x Angry-Distress	-	-	0.072	.066	
Demographic Covariates:					
Gender	< 0.001	.043	0.006	.042	
Age	0.054	.046	0.058	.043	
Asian	-0.032	.042	-0.046	.041	
Black	-0.008	.053	-0.034	.049	
Other	0.075	.039	0.067	.036	

*p < .05. ** p < .01. *** p < .001.

5.4 ADHD x Angry-Distress

The results from ADHD and angry-distress as predictors of academic self-concept and general self-esteem can be found in Table 28. Both ADHD ($\beta = -.457$, p < .001) and Angry-Distress ($\beta = -.258$, p < .001) were significant negative predictors of general self-esteem. However, only ADHD was a significant negative predictor of academic self-concept ($\beta = -.384$, p < .001). The interaction term was non-significant (academic self-concept, $\beta = .072$, p = .280; general self-esteem $\beta = -.011$, p = .832). Female participants reported lower ($\beta = -.164$, p = <.000) general self-esteem while Asian heritages reported higher ($\beta = .160$, p = .001) general self-esteem. Relations with all other covariates were not statistically significant (p's > .05).

Table 29.

Model 1 and 2 Standardised Coefficients for the Moderating Role of ADHD and Availability on Academic Self-Concept and General Self-

Esteem.

	Model 1 (No I	Model 2 (In	teraction)		
	Standardised C	Coefficients	Standardised Coefficients		
	β	SE	β	SE	
General Self-Esteem:					
ADHD	-0.421***	.052	-0.419***	.058	
Availability	-0.312***	.050	-0.313**	.050	
ADHD x Availability	-	-	0.009	.062	
Demographic Covariates:					
Gender	-0.190***	.042	-0.189***	.041	
Age	0.056	.045	0.055	.044	
Asian	0.190***	.046	0.191*	.046	
Black	0.081	.049	0.082	.048	
Other	0.077*	.038	0.076*	.038	
Academic Self-Concept:					
ADHD	-0.355**	.115	-0.487***	.052	
Availability	-0.119*	.058	-0.131*	.055	
ADHD x Availability	-	-	0.073	.060	
Demographic Covariates:					
Gender	-0.010	.043	< 0.001	.042	
Age	0.047	.047	0.044	.043	
Asian	-0.021	.042	-0.031	.042	
Black	-0.004	.052	-0.030	.047	
Other	0.084*	.040	0.076*	.036	

*p < .05. ** p < .01. *** p < .001.

5.5 ADHD x Availability

The results from ADHD and availability as predictors of academic self-concept and general self-esteem can be found in Table 29. ADHD and availability were significant negative predictors of general self-esteem (ADHD β = -.421, *p* < .001; availability β = -.312, *p* < .001) and academic self-concept (ADHD β = -.355, *p* = .002; availability β = -.119, *p* = .040).

The interaction term was non-significant (academic self-concept: $\beta = .073$, p = .217; general self-esteem: $\beta = .009$, p = .884). Female participants reported lower general self-esteem ($\beta = -.190$, p < .001). Asian ($\beta = .190$, p < .001) and 'other' ($\beta = .077$, p = .044) heritages reported higher general self-esteem. Participants from 'other' backgrounds reported higher academic self-concept ($\beta = .084$, p = .035). Relations with all other covariates were not statistically significant (p's > .05).

Table 30.

Model 1 and 2 Standardised Coefficients for the Moderating Role of ADHD and Goal Corrected Partnership on Academic Self-Concept and

General Self-Esteem.

	Model 1 (No Interaction) Standardised Coefficients		Model 2 (Interaction) Standardised Coefficients	
	β	SE	β	SE
General Self-Esteem:				
ADHD	-0.506***	.051	-0.501***	.062
Goal-Corrected Partnership	-0.148**	.053	-0.148**	.055
ADHD x Goal-Corrected Partnership	-	-	0.006	.061
Demographic Covariates:				
Gender	-0.200***	.043	-0.198***	.043
Age	0.069	.046	0.069	.046
Asian	0.125*	.051	0.128*	.051
Black	0.055	.050	0.055	.050
Other	0.065	.039	0.065	.039
Academic Self-Concept:				
ADHD	-0.399***	.096	-0.461***	.056
Goal-Corrected Partnership	-0.073	.064	-0.109	.063
ADHD x Goal-Corrected Partnership	-	-	0.097	.063
Demographic Covariates:				
Gender	-0.014	.045	-0.015	.044
Age	0.053	.046	0.051	.043
Asian	-0.045	.044	-0.059	.042
Black	-0.016	.051	-0.050	.047
Other	0.078*	.038	0.069*	.035

*p < .05. ** p < .01. *** p < .001

5.6 ADHD x Goal-Corrected Partnership

Table 30 reports the results from ADHD and goal-corrected partnership as predictors of academic self-concept and general self-esteem. ADHD (β = -.506, *p* <.001) and goal-corrected partnership (β = -.148, *p* = .006), were significant negative predictors of general self-esteem. Only ADHD (β = -.399, *p* < .001) was a significant negative predictor of academic self-concept.

The interaction term was non-significant (academic self-concept: $\beta = -.097$, p = .122; general self-esteem: $\beta = .006$, p = .921). Female participants reported lower general selfesteem ($\beta = -.200$, p < .001). Asian heritages reported higher general self-esteem ($\beta = .125$, p < .001). Participants from 'other' backgrounds reported higher academic self-concept ($\beta = .078$, p = .035). Relations with all other covariates were not statistically significant (p's > .05).

Table 31.

Model 1 and 2 Standardised Coefficients for the Moderating Role of ADHD and Social and Communication Difficulties on Academic Self-

Concept and General Self-Esteem.

	Model 1 (No Interaction) Standardised Coefficients		Model 2 (Interaction) Standardised Coefficients	
	β	SE	β	SE
General Self-Esteem:				
ADHD	-0.400***	.051	-0.376***	.053
Social and Communication	-0.444***	.040	-0.446***	.042
ADHD x Social and Communication	-	-	0.068	.050
Demographic Covariates:				
Gender	-0.158***	.037	-0.158***	.036
Age	0.022	.040	0.022	.040
Asian	0.130**	.044	0.132**	.044
Black	0.061	.045	0.062	.045
Other	0.084*	.040	0.083*	.039
Academic Self-Concept:				
ADHD	-0.402***	.098	-0.526***	.045
Social and Communication	-0.024	.058	-0.011	.055
ADHD x Social and Communication	-	-	-0.026	.058
Demographic Covariates:				
Gender	-0.002	.042	0.006	.042
Age	0.049	.046	0.053	.043
Asian	-0.039	.042	-0.049	.041
Black	-0.010	.053	-0.029	.049
Other	0.079*	.039	0.072*	.036

*p < .05. ** p < .01. *** p < .001.

5.7 ADHD x Social and Communication

The results from ADHD and social and communication as predictors of academic self-concept and general self-esteem can be found in Table 31. ADHD (β = -.400, p < .001) and social and communication (β = -.444, p < .001) were significant negative predictors of general self-esteem. Only ADHD (β = -.402, p < .001), was a significant negative predictor of academic self-concept.

The interaction term was non-significant (academic self-concept: $\beta = -.026$, p = .655; general self-esteem: $\beta = .068$, p = .180). Female participants reported lower general self-esteem ($\beta = -.158$, p < .001). Asian ($\beta = .130$, p = .003) and 'other' ($\beta = .084$, p = .035) heritages reported higher general self-esteem. Participants from 'other' backgrounds reported higher academic self-concept ($\beta = .079$, p = .041). Relations with all other covariates were not statistically significant (p's > .05).

Table 32.

Model 1 and 2 Standardised Coefficients for the Moderating Role of Angry Distress and Social and Communication Difficulties on Academic

Self-Concept	and General	Self-Esteem.
<i>J</i> 1		<i>J</i>

	Model 1 (No Interaction) Standardised Coefficients		Model 2 (Interaction) Standardised Coefficients	
	β	SE	β	SE
General Self-Esteem:				
Angry-Distress	-0.299***	.045	-0.287***	.049
Social and Communication	-0.480***	.037	-0.487***	.037
Angry-Distress x Social and Communication	-	-	0.040	.046
Demographic Covariates:				
Gender	-0.144***	.034	-0.144***	.034
Age	0.015	.037	0.015	.037
Asian	0.189***	.036	0.188***	.036
Black	0.101*	.042	0.101*	.041
Other	0.067	.038	0.069	.038
Academic Self-Concept:				
Angry-Distress	-0.231***	.062	-0.239***	.057
Social and Communication	-0.116	.065	-0.110	.065
Angry-Distress x Social and Communication	-	-	-0.027	.068
Demographic Covariates:				
Gender	-0.008	.048	-0.008	.048
Age	0.032	.049	0.032	.049
Asian	0.049	.045	-0.025	.044
Black	-0.002	.058	-0.002	.058
Other	0.077	.043	0.076	.042

*p < .05. ** p < .01. *** p < .001.

5.8 Angry-Distress x Social and Communication

The results from angry-distress and social and communication as predictors of academic self-concept and general self-esteem can be found in Table 32. Angry-distress (β = -.299, *p* < .001) and social and communication (β = -.480, *p* < .001) were significant negative predictors of general self-esteem. Only angry-distress (β = -.231, *p* < .001), was a significant negative predictor of academic self-concept.

The interaction term was non-significant (academic self-concept: $\beta = -.027$, p = .715; general self-esteem: $\beta = .040$, p = .382). Female participants reported lower general self-esteem ($\beta = -.144$, p < .001). Asian ($\beta = .189$, p < .001) and black ($\beta = .101$, p = .015) heritages reported higher general self-esteem. Covariates were not significant predictors of academic self-concept (p's > .05).

Table 33.

Model 1 and 2 Standardised Coefficients for the Moderating Role of Availability and Social and Communication Difficulties on Academic Self-

Concept and General Self-Esteem.

	Model 1 (No Interaction) Standardised Coefficients		Model 2 (Interaction) Standardised Coefficients	
	β	SE	β	SE
General Self-Esteem:				
Availability	-0.330***	.046	-0.315***	.048
Social and Communication	-0.456***	.039	-0.451***	.041
Availability x Social and Communication	-	-	0.061	.044
Demographic Covariates:				
Gender	-0.174***	.034	-0.175***	.034
Age	0.001	.038	0.002	.038
Asian	0.217***	.036	0.217***	.036
Black	0.108*	.043	0.109**	.042
Other	0.093*	.036	0.094**	.036
Academic Self-Concept:				
Availability	-0.258***	.057	-0.256***	.057
Social and Communication	-0.093	.065	-0.093	.065
Availability x Social and Communication	-	-	0.010	.068
Demographic Covariates:				
Gender	-0.028	.047	-0.029	.047
Age	0.020	.049	0.020	.049
Asian	-0.004	.044	-0.004	.044
Black	0.004	.054	0.004	.054
Other	0.096*	.043	0.097*	.022

*p < .05. ** p < .01. *** p < .001

5.9 Availability x Social and Communication

Table 33 reports the findings from availability and social and communication as predictors of academic self-concept and general self-esteem. Availability ($\beta = -.330$, p < .001) and social and communication ($\beta = -.456$, p < .001) were significant negative predictors of general self-esteem. Only availability ($\beta = -.258$, p < .001), was a significant negative predictor of academic self-concept.

The interaction term was non-significant (academic self-concept: $\beta = .010$, p = .882; general self-esteem: $\beta = .061$, p = .161). Female participants reported lower general selfesteem ($\beta = ..174$, p < .001). Asian ($\beta = .217$, p < .001), Black ($\beta = .108$, p = .012) and 'other' ($\beta = .093$, p = .010) heritages reported higher general self-esteem. Only 'other' ethnicities was a significant positive predictor of academic self-concept ($\beta = .096$, p = .025).

Table 34.

Model 1 and 2 Standardised Coefficients for the Moderating Role of Goal Corrected Partnership and Social and Communication Difficulties on

Academic Self-Concept and General Self-Esteem.

	Model 1 (No Interaction) Standardised Coefficients		Model 2 (Interaction) Standardised Coefficients	
	β	SE	β	SE
General Self-Esteem:				
Goal Corrected Partnership	-0.173**	.051	-0.164**	.050
Social and Communication	-0.501***	.038	-0.472***	.044
Goal Corrected Partnership x Social and Communication	-	-	0.080*	.035
Demographic Covariates:				
Gender	-0.188***	.036	-0.185***	.036
Age	0.009	.040	0.008	.040
Asian	0.151***	.040	0.155***	.040
Black	0.087	.045	0.084	.044
Other	0.083*	.040	0.080*	.039
Academic Self-Concept:				
Goal Corrected Partnership	-0.200**	.068	-0.198**	.067
Social and Communication	-0.112	.068	-0.109	.074
Goal Corrected Partnership x Social and Communication	-	-	0.012	.076
Demographic Covariates:				
Gender	-0.048	.050	-0.048	.050
Age	0.029	.052	0.029	.052
Asian	-0.062	.049	-0.061	.049
Black	-0.019	.055	-0.019	.055
Other	0.087*	.043	0.087*	.042

*p < .05. ** p < .01. *** p < .001

5.10 Goal-Corrected Partnership x Social and Communication

Finally, Table 34 reports the findings from the goal-corrected partnership and social and communication as predictors of academic self-concept and general self-esteem. Goal-corrected partnership ($\beta = -.173$, p = .001) and social and communication ($\beta = -.501$, p < .001) were significant negative predictors of general self-esteem. Only goal-corrected partnership ($\beta = -.200$, p = .003), was a significant negative predictor of academic self-concept.

The interaction term was a significant predictor of general self-esteem ($\beta = .080$, p = .024). However, this interaction was not accepted due to an insignificant *D* score (*D* [1] = 1.607, p = .200) and negligible differences between AIC and aBIC (< 10) scores (as reported in Table 22) demonstrating that Model 2 did not offer a significant improvement in model fit over Model 1. Therefore, Model 2 was rejected, and Model 1 was accepted.

Female participants reported lower general self-esteem ($\beta = -.188$, p < .001). Asian ($\beta = .151$, p < .001), and 'other' ($\beta = .083$, p = .040) heritages reported higher general selfesteem. Only 'other' ethnicities was a significant positive predictor of academic self-concept ($\beta = .087$, p = .043).

5.11 Latent Interaction Structural Equation Models Summary

Of the LI-SEM models tested there was only one case of a significant interaction between the predictors (goal-corrected partnership x social and communication) on general self-esteem. However, this model was rejected. Most importantly the non-significant *D* score demonstrated that Model 2 offered no significant advantage in model fit than Model 1. In addition to this, the AIC difference between Model 1 and 2 was marginal, thus Model 1 was as good fitting as Model 2 (Δ AIC < 2). Despite the lack of interactions in the other models tested, there is evidence of cumulative effects of the predictors on general self-esteem in all models tested and one example of a cumulative impact is shown in Table 29, where ADHD and availability were regressed onto academic self-concept. There were no other examples of a cumulative impact of both predictor variables on academic self-concept found in this research. However, at least one predictor in each model significantly negatively predicted academic self-concept, with each variable tested significantly negatively predicting academic self-concept. Covariates were present in all models, with substantially more covariates predicting general self-esteem than academic self-concept. Gender held as a significant negative predictor of general selfesteem across all models tested. Chapter 6 - Discussion of the Demonstrated Relations between ADHD Behaviours, Social and Communication Difficulties of Autism, Attachment Characteristics and the Academic Self-Concept and Self-Esteem of Adolescents in Sixth-Form Colleges

6.1 Orientation

The findings of the LI-SEM project outlined in Section 5 will now be discussed. Attention will first be drawn to the theoretical models of ADHD, social and communication difficulties of Autism, attachment characteristics and the academic self-concept and general self-esteem. Following this, the correlations found between the variables will be discussed and then finally the regressions and demonstrated additive effect will be considered.

6.2 Discussion

The SEM and LI-SEM constructed in this research allowed the researchers to determine the relations between ADHD behaviours, social and communication difficulties associated with Autism, attachment characteristics and the academic self-concept and general self-esteem. The models created tested for correlations, regressions and interactions between ADHD behaviours, social and communication difficulties of Autism and attachment characteristics in the relation to the general self-esteem and academic self-concept.

The theoretical models of ADHD behaviours, social and communication difficulties of Autism and attachment characteristics found in the construct validations (outlined in Section 4) also held for the SEM and LI-SEM analysis conducted. The fit between model and data was found to hold with the inclusion of age, ethnicity and gender as covariates (as referenced in Section 5). However, the goodness of fit scores did deteriorate to below the thresholds suggested by Hu and Bentler (1999) following the inclusion of covariates into the model. Despite the deterioration of the goodness of fit scores to below Hu and Bentler's (1999) threshold, these 'rules' amount to little more than rules of thumb (McDonald & Marsh, 1990). Furthermore, deviations are to be expected and are not necessarily indicative of an unsuitable fit between model and data (Marsh et al., 2004) and the incremental fit indices remained \geq .90 As such, the incremental fit indices were still indicative of an acceptable fit according to Bentler and Bonnett's (1980) posited cut-off levels for fit indices. Thus, it can be concluded that the data gathered in this thesis does reasonably fit with the theoretical models of ADHD behaviour, attachment characteristics, social interaction and communication difficulties associated with Autism and both academic self-concept and general self-esteem.

Although the goodness of fit indices did change slightly between the projects in this thesis, the theoretical models of ADHD behaviour, social and communication difficulties of Autism and attachment characteristics supported the findings of previous research on the theoretical structures of ADHD behaviour, social and communication difficulties of Autism and attachment characteristics. For example, research by Sochos and Lokshum (2017) found the same three-factor model of attachment as angry-distress, availability and goal-corrected partnership that was found in the construct validation conducted in this doctoral thesis and suggested originally by West et al. (1998). Furthermore, the items in the ASRS (Kessler et al., 2005) utilised to measure were all found to fall under a one-factor structure as suggested by Kessler et al. (2007). The only slight variations in theoretical models were the model of Autism measured by the AQ-10 (Allison et al., 2012) and the higher-order models found in the academic self-concept and general self-esteem subscales of the SDQ III (Marsh & O'Neill, 1984). However, the factor structure of the AQ-50 (Baron-Cohen et al., 2001), which the AQ-10 (Allison et al., 2012) is derived from, has been largely critiqued as unsuitable. In addition to this, more recent research by Bertrams and Shah (2021) on the factor structure of the AQ-10 (Allison et al., 2012) also found similar issues in factor structure to the findings of this doctoral research. Despite these issues in the factor structure
of the AQ-10, Bertrams and Shah's (2021) research demonstrated that the social and communication factors grouped coherently as in the findings of this doctoral thesis, however in Bertrams and Shah's (2021) research, attention switching was also found to group coherently. Therefore, we can be confident that the data gathered fits the theoretical model posited for each construct before determining how they may relate to the other.

Despite the models posited matching the data gathered, the factor loadings between items and factors did demonstrate some change between the construct validation and the LI-SEMs. For example, items in the ASRS both improved and deteriorated between the construct validation and the LI-SEM (demonstrated in Sections 4 and 5). These changes were slight across all models and may be representative of changes in participant samples and subsequent interpretation of items.

Scores of internal consistency also changed between the construct validations of the instruments used and the following LI-SEM study. For example, the findings of the construct validation for the AAQ (West et al., 1998) demonstrated an improvement in the Cronbach's α scores of the angry-distress subscale, as compared to the original Cronbach's α scores found at the time of the instrument's construction (original angry-distress Cronbach's $\alpha = .62$, construct validation Cronbach's $\alpha = .70$). However, these same scores of internal consistency decreased in the data from the LI-SEM. Despite this reduction, the Cronbach's α scores still demonstrated a slight improvement on the original Cronbach's α scores (original angry-distress $\alpha = .62$, LI-SEM angry-distress $\alpha = .63$). Scores of internal consistency for the ASRS (Kessler et al., 2005) also demonstrated a slight improvement compared to the Cronbach's α scores in the construct validation of the adolescent amendment. During the construct validation, the Cronbach's α score for the ASRS (Kessler et al., 2005) was Cronbach's $\alpha = .64$. However, when tested in the LI-SEM study, the Cronbach's $\alpha = .66$. This potential increase in the internal consistency of data could be due to the removal of the poorly loading

sixth item in the instrument following the construct validation and before the LI-SEM. Alternatively, the change of sample and increased sample size could also have contributed to this increase. Regardless of the reasons behind the increase in Cronbach's α scores, the improvement in score means that it is possible to be relatively confident that the agreement between item responses by participants was coherent.

To summarise, the fit between data and model which was found in the LI-SEM was consistent with past research, with no significant changes in posited models of ADHD behaviours, attachment characteristics, social and communication difficulties of Autism or the academic self-concept and general self-esteem. Therefore, it is with confidence that these models were accepted before exploring correlations, regressions and interactions between the constructs.

6.2.1 Correlations

The behaviours associated with ADHD, attachment characteristics and social and communication difficulties of Autism were all shown to be positively intercorrelated with each other and all negatively correlated with both the academic self-concept and general selfesteem. This is supportive of past research which has demonstrated that interpersonal communication skills are correlated with self-concept (Yahaya & Ramli, 2009), attachment anxiety negatively correlates with self-concept (Zamzur & Yahya, 2019), and diagnosed ADHD is associated with lower self-concept and self-esteem (Foley-Nicpon et al., 2012). Furthermore, it supports the findings of Finzi-Dottan et al. (2006), Joshi et al. (2017), Rutgers et al. (2007), Storebø et al. (2016) and Teague et al. (2020) for example, who have demonstrated that ADHD, insecure attachment patterns and Autism are all likely to co-occur. The correlations between ADHD behaviours, attachment characteristics and social and communication difficulties of Autism demonstrated in this doctoral thesis further increases understanding of this area, by showing that co-occurrence occurs in not just categorical/diagnosed models of ADHD, attachment styles and Autism, but also as continuums of behaviours present throughout the general population. This means that in a normal classroom population any adolescent who is likely to show inattentive, hyperactive and impulsive behaviours is also likely to demonstrate problems with social interaction and communication and certain attachment characteristics.

6.2.2 Regressions

The results of the multiple regression analysis demonstrated that ADHD behaviours, attachment characteristics and social and communication difficulties negatively predict either (or in some cases both) the academic self-concept and general self-esteem of sixth-form students. For example, ADHD behaviours were significant negative predictors of both academic self-concept and general self-esteem, whereas the social and communication difficulties associated with Autism were not a significant predictor of academic self-concept but was a significant predictor of general self-esteem. This is surprising as adequate social interaction and communication skills are a requirement for appropriate functioning in education. Indeed, the social and communication difficulties experienced by those with Autism in school has been shown to lead to bullying and social isolation (Reid & Batten, 2006). Furthermore, social and communication difficulties have been found to lead to exclusion from activities and non-attendance at extra-curricular activities (Shattuck et al., 2011). Bullying, isolation and exclusion can be considered to be negative feedback as it could be perceived to be a rejection of the self in school. Therefore, one would expect that this would adversely affect the students' academic self-concept. However, this did not seem to be the case as the social and communication difficulties of Autism did not adversely predict the academic self-concept. This could be because the social and communication difficulties of Autism did not pose a barrier to academic functioning in a tangible sense. For example,

children were able to appropriately complete schoolwork and thus negate any negative feedback to the self in this way.

As expected, ADHD behaviours were found to be significant negative predictors of both the general self-esteem and academic self-concept of sixth-form students. There is limited research exploring the role of ADHD in the self-concept and to the researcher's awareness, none have used the SDQ III (Marsh & O'Neill, 1984) to measure the self-concept. Despite this, past research has demonstrated that the inattentive behaviours of ADHD in 7 to 10-year-olds negatively predicted academic achievement at age 16 (Holmberg & Bölte, 2014). Furthermore, research has shown that gifted students with ADHD had lower selfesteem and happiness than those gifted students who did not have a diagnosis of ADHD (Foley-Nicpon et al., 2012). Thus, the findings of this doctoral research continue the trend of past research. However, the work by Holmberg and Bölte (2014) and Foley-Nicpon et al. (2012) do not evidence a relation between ADHD behaviours specifically and the selfconcept, they do demonstrate that ADHD as a category is associated with worse self-concept and academic performance. As academic achievement is inextricably linked to the selfconcept of individuals (as referenced in Section 2.3), we can assume that in the case of Holmberg and Bölte's (2014) research that the negative predictive effect of inattention on academic achievement likely also had repercussions for the self-concept of the individual. We can also tentatively suggest that the presence of ADHD behaviours in the sample of students utilised in this doctoral thesis likely also had negative repercussions for academic achievement. This potentially explains the mechanism by which ADHD behaviours are adversely related to the self-concept.

The negative predictive relationship between the three attachment factors and academic self-concept and general self-esteem also mimics previous work which demonstrated that children's attachment to their father predicts a child's academic selfconcept and mastery of language (Bacro, 2012). This seems to suggest that individuals' attachment to their parents is closely related to their perception of themselves both generally and academically. Moss and Saint-Laurent (2001) hypothesised that this was due to healthier attachment patterns contributing to more competent exploratory behaviours that informs school readiness and engagement during a child's formative years. Alternatively, according to Guay et al. (2003), it could be that healthier attachment behaviours lend themselves to more adaptive student-teacher attachments which can contribute to a more positive academic self-concept. The importance of attachment to self-concept is well documented in research, however, this has usually focused on specific attachment styles (as referenced in Section 1 and 2.3). Regardless, it is clear that our early experiences inform an internal working model of ourselves and others (Verschueren et al., 1996) that contributes to the self-concept we have. Therefore, the predictive relation between attachment characteristics and the self-concept we have that is demonstrated in the findings of this doctoral research contributes to an existing body of research including the work of Bacro (2012) and Moss and Saint-Laurent (2001).

6.2.3 The Demonstrated Additive Effect

It was hypothesised that the relation between ADHD behaviours, attachment characteristics and social and communication difficulties of Autism would either interact in relation to the self-concept or show evidence of an additive effect. Therefore, both interaction and additive mechanisms were tested. There was only one significant interaction found. However, this model was not accepted as the inclusion of an interaction variable demonstrated no significant advantage over the model without the interaction variable (D =1.607, df = 1, p = .200). In all cases, models without interaction variables (Model 1) were accepted and as such, it is possible to conclude that ADHD behaviours, social and communication difficulties of Autism and attachment characteristics do not interact in their relation to the self-concept. However, in some cases, the presence of ADHD behaviours, social and communication difficulties of Autism and certain attachment characteristics concurrently leads to a summative effect, whereby there is a greater predictive effect on the academic self-concept and general self-esteem (Tables 28-34). This summative effect could theoretically occur due to the presence of multiple co-occurring problematic behaviours which lead to greater and more difficulties in both academic and general functioning. This, in turn, would lead to greater and more frequent adverse feedback and a worse self-concept. For example, the presence of ADHD behaviours in the lesson would lead to worse academic functioning in classroom tasks, exams and homework (Jangmo et al., 2019) and greater negative intervention from teachers. If this occurred with additional social interaction and communication difficulties, for example, the result would be additional problems working in groups or understanding social cues. This could then result in social exclusion from peers due to the interaction and communication problems in addition to the negative feedback for the ADHD behaviours. Therefore, there would be increasingly frequent negative feedback occurring to both the ADHD behaviours and social and communication difficulties, thus leading to an adverse effect on the self-concept. If we conceptualise this to the general selfesteem of adolescents, the same assumption could also hold. Inattentive ADHD behaviours may make it difficult for adolescents to follow conversations and result in problems socialising (see Storebø et al., 2019), whereas co-occurring maladaptive attachment characteristics could make relationship building with peers more difficult (see Seibert & Kerns, 2015). These two difficulties occurring together would result in a consistent flow of adverse feedback to the self-concept. Research has demonstrated some support of the notion that ADHD behaviours, Autistic traits and maladaptive attachment patterns can affect functioning differently. For example, in a specific educational context, research has shown that children who demonstrate Autistic traits in school are at a greater risk of bullying and

inadequate social support in school (Humphrey & Symes, 2010). In addition to this, they are at risk of greater peer rejection and lower acceptance in school (Symes & Humphrey, 2010). Furthermore, maladaptive attachment characteristics, conceptualised as insecure attachment styles, are associated with worse learning disposition and achievement (Larose et al., 2005) in addition to greater delinquency and a lack of social competence, as compared to secure attachments (Bergin & Bergin, 2009). Therefore, as ADHD behaviours, Autistic traits and maladaptive attachment characteristics can impact functioning in different ways, it is possible that different responses by teachers and peers could explain the additive effect demonstrated in cases of ADHD behaviours, Autistic traits and attachment characteristics co-occurrence on both the academic self-concept and general self-esteem.

However, the additive effect of co-occurring ADHD behaviours, social and communication difficulties of Autism and maladaptive attachment characteristics on the academic self-concept and general self-esteem could also occur due to impacts on domainspecific self-concepts that form the overall academic self-concept and general self-esteem. Indeed, Marsh et al.'s (1988) model of the academic self-concept posited that the academic self-concept was comprised of verbal and mathematical higher orders, which in turn were comprised of subject-specific self-concepts. In contrast, general self-esteem was comprised of specific facets such as social self-concept (see Marsh & Shavelson, 1985). The academic selfconcept scale utilised in this doctoral research did not find that same higher-order structure as Marsh et al. (1988). Instead, the findings of this doctoral thesis found two lower-order factors of cognitive and affective elements of the academic self-concept, in addition to positive and negative lower-order factors of the general self-esteem. Despite this, the same principle that domain-specific factors are affected applies, which then contributes to the formation of the overall academic self-concept and general self-esteem. Specific domains of the self-concept may be more or less affected by certain behaviours, with more manifesting co-occurring behaviours leading to a greater chance of more domain-specific self-concepts being adversely impacted. This impact would then contribute to the overall academic self-concept and general self-esteem. For example, social and communication problems may not be a problem in lessons where students are working independently, or at home when parents have a good understanding of how their child communicates. However, in the same situations, the inattention problems of ADHD behaviours would limit the work that can be achieved independently or the attention a child pays to their parents' social cues. Therefore, the co-occurrence of multiple behaviours would lead to an impact in multiple domain-specific self-concepts that result in an additive effect on the overall academic self-concept and general self-esteem.

6.2.4 Conclusions

The findings of the quantitative element of this doctoral research have demonstrated that the co-occurrence of ADHD behaviours, social and communication difficulties of Autism and maladaptive attachment characteristics do not interact in their relation to the academic self-concept and general self-esteem of sixth-form college students. Instead, the cooccurrence of these phenomena leads to an additive effect in some instances. In these instances, there is a greater negative predictive effect than in the case of just one phenomenon (for example, just ADHD behaviours) manifesting. The additive effect likely occurs due to a greater frequency of manifesting problems across numerous situations that could then result in more frequent adverse feedback to domain-specific self-concepts. Greater negative feedback to more domain-specific self-concepts would then inform the overall academic selfconcept and general self-esteem.

Chapter 7 - Teacher Themes in their Interpretation and Management of Student Behaviours in the Classroom

7.1 Introduction and Context

Teacher responses to student behaviour inform the construction of academic selfconcept and general self-esteem, according to Marsh and Yeung's (2001) frame of reference model. Therefore, the exploration of teacher themes in student behaviour in the classroom allows an insight into teachers' perceptions of student behaviour and how they respond to these. Data from interviews with teachers shed light on how they approach atypical student behaviours. This provided insight into the implicit messages sent to these students, how these could be interpreted by students and may influence their self-concept. The findings of the qualitative phase will both be abducted to self-concept theory as per the critical realist paradigm and interpreted in relation to the third research question (outlined in Section 3) focusing on teachers' perceptions and management styles of ADHD behaviours, social and communication difficulties of Autism and attachment characteristics in the classroom.

In reporting data, pseudonyms have been used to preserve anonymity while enabling differentiation between participants. Teachers were asked to consider the management and impact of hyperactivity, inattention, impulsivity, social and communication difficulties and problems with relationships. Whilst these are indicators of ADHD, Autism and attachment difficulties, no specific reference was made to these conditions. Nonetheless, in some cases, participants explicitly referred to these conditions in their replies.

It was apparent that the school and education context in which the teachers operated directly influenced their answers in the interviews. As the context was found to permeate all the themes identified it is important to report these contextual considerations. This will orient

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the reader to the wider educational context the teachers found themselves in and how this influenced the answers given.

There were three specific contextual factors found across all interviews, these were SEND, educational outcomes and high expectations/positivity. To elaborate this further, answers given by teachers framed behaviours in relation to SEND. Furthermore, a relation was apparent in that if the behaviour was atypical it was SEND and if it was SEND it was presumed to be a clinical condition. This relation was evident despite the interviews focusing on specific behaviours with no reference to clinical conditions.

Further, in a nod to the underlying function of school and education, all answers were framed in relation to educational achievement and functioning. Teachers evaluated behaviours by their perceived impact on the student and the class. Teachers then utilised this judgment and assessment to inform what would be needed to support functioning to maximise academic outcomes, attempting to tailor their teaching to the specific student needs.

Finally, despite conceptualisation of behaviours in relation to SEND and the maximisation of educational outcomes, there was a specific undercurrent of high expectations/positivity by teachers relating to hypothetical students with atypical behaviours. All those interviewed were confident that atypical student behaviours would have a minimal impact on the students' ability to achieve or the class, as long as these behaviours were managed appropriately with support from the teacher.

These factors are likely to directly stem from the teachers' training and current educational policy. Indeed, the SEND Code of Practice (Department for Education & Department for Health, 2015) identifies SEND as a greater difficulty in learning than most students will experience. The SEND Code of Practice (Department for Education & Department for Health, 2015) reflects assumptions about 'normal' classroom behaviour, with atypical behaviour breaking these assumptions and likely resulting in a greater difficulty in learning due to difficulties in classroom functioning. In light of this, it is understandable that teachers would conceptualise and approach atypical behaviours as indicative of a special educational need.

Finally, the ITT Core Content Framework (Department for Education, 2019) and Teachers' Standards (Department for Education, 2013) are also likely to have contributed to the aforementioned contextual factors. Indeed, Teachers' Standard 5 (Department for Education, 2013) stipulates that teaching should be adapted to the needs of students to facilitate and enable success. In other words, recognition should be made of SEND in the classroom with provision tailored as such to maximise educational outcomes in these students. Furthermore, Teachers' Standard 1 sets high expectations and Teachers' Standard 2 covers pupil progress over time which informed the pervasive high expectations teachers demonstrated throughout the interviews.

7.2 Themes

In total, there were seven themes identified from the interviews conducted. These will now be reported and were comprised of:

- Resilience, which explored student responses to failure and resilience as a desirable quality.
- Enthusiasm, with both high and low enthusiasm problematic in functioning in the classroom.
- Individual adjustments, as compensatory strategies and techniques by teachers to support students.

- Behavioural management strategies, which took the form of modelling, sanctions and praise and rewards.
- Classroom dynamics, reflecting the relationships between students and teachers and classroom atmosphere.
- Classroom assistance, represents the demands of the role of a teacher and the need for support to carry this out successfully.
- Time, which was a reference to the perceived lack of time teachers had to meet lesson objectives.

A summary of the themes, subthemes and relevant codes can be found in Table 35 reported below.

Table 35.

Themes	Subthemes	Codes
Resilience	Persistence	Feedback persistence
	• Tolerance	Failure tolerance
	• Effort	Maintained effort
		Resilience to Failure
Enthusiasm	• Enthusiasm	Excitability
	Avolition/Apathy	Energy
	Motivation	Apathy
		Teacher Effort
		Buy-in
		Motivated

Summary of Themes, Subthemes and Codes

Individual Adjustments	• Student-Centred	Adapting student
	Adjustments	Adapting environment
	• Environmental	Changing environment
	Adjustments	
	Changing Context	
Behavioural Management	• Modelling	Job/task
Strategies	• Praise	Behaviour code
	• Sanctions	Demonstration and
	• Student	modelling
	"Employment"	Praise/compliments
		Punishment
Classroom Dynamics	• Atmosphere	Classroom feeling
	• Relationships	Peer socialisation
	Socialisation	Teacher socialisation
	• Routine/Timetabling	Teacher-student relationship
		Peer-peer relationship
		Timetable
		School exhaustion
		Topic disinterest
Classroom Assistance	• Teaching Assistants	LA/TA
	• Resourcing	IT equipment
		Resources/materials
Time	• Time Limitations	Rushed/pressured
	• Time Pressure	Time limit
		Competing demands

7.3 Resilience

Resilience was considered by teachers to be a quality that was adaptive to learning and was considered to be both innate and developed. Both Sarah and Rachel construed resilience as innate. Sarah said that when students fail and then begin to understand why they failed, the resilience to work out how to overcome the problem is conducive to learning. Rachel also stated that the mark of an academically capable student is when they are resilient and keep trying even if they encounter difficulty.

There was a consensus among the teachers interviewed that resilience to failure in class is an important quality for good classroom functioning. Michael, like Rachel and Sarah, said that "independence and resilience" are two of the most conducive behaviours for learning that students can demonstrate. He built upon this by saying that:

"when pupils are resilient and try again and again, they will eventually learn from their mistakes."

Furthermore, Alice identified resilience as a developed quality. According to Alice resilience was thought to be an outcome of teaching in addition to the hallmark of a capable student and desirable behaviour. When asked about the impact she believed teachers had on a student's self-concept she said:

"I think that comes from setting routine and spending time building a relationship of belief and resilience. Persistence is necessary, with some students to cement in their mind their capabilities."

7.4 Enthusiasm

Enthusiasm was frequently seen as a necessary quality in students for learning. Indeed, Charlotte provided a succinct summary of the need for enthusiasm in pupils,

"... You could paint a classroom in which every child is silent..., focusing on the task at hand, but are so utterly bored out of their minds that nothing is sticking. But you can have exactly the same scenario, but the students are really keen on the subject and are enthused by it..."

However, while enthusiasm was usually presented as an adaptive quality, there was a notion of motivation as a continuum with either extreme being problematic. When asked about behaviours that were difficult to manage, Michael said:

"... in my experience, it's mainly the two ends of the spectrum when it comes to enthusiasm in the class."

Michael elaborated this further by explaining the issue with over-enthusiasm:

"I find it quite difficult to deal with pupils who are constantly trying to shout out and interrupt other pupils because they know the answer to a question or have an idea they'd like to share. I don't want to put these pupils off by going through the behaviour system the school has in place nor do I want to let them continue so other pupils give up trying."

While Michael was the only interviewee to reference excess enthusiasm as a problem, all participants noted lack of enthusiasm and motivation as difficult to manage. Both Samantha and Lisa found that this was the most difficult behaviour to manage, with unenthusiastic students seen to lack interest and ambition. In cases such as this teachers believed there was little they could do to change this.

Emma provided clarity on the impact of unenthusiastic students on the teacher:

".... Even when I feel like I've given Disneyland on a plate to them... Using interactive games and interesting slide shows with colourful images. If that child is not interested... This is what I find very disheartening."

Susan, like Emma, also highlighted the human experience of what it was like to attempt to manage an unenthusiastic student in the class, portraying a battle between teacher and student:

"The ones I find most difficult to manage is the one where a child will point blank refuse to work or engage in any way... But the behaviour that shows signs of refusal with no willingness is probably the most difficult... you feel at a loss and simply find it unmanageable after exhausting every avenue."

Alice also referenced a lack of enthusiasm as a significantly difficult behaviour to manage. However, she painted an almost strategic element to enthusiasm, highlighting selective priority in students when engaging with classes:

"I find particular difficulties with Y9 boys who aren't opting for your subject the following year. Their behaviour traits when they are disengaged – or if they have come from PE for example, trying to get them to calm down."

7.5 Individual Adjustments.

Individually focused adjustments was another common theme identified in the interviews and are a specific approach to facilitate maximum engagement and functioning in class. Actual adjustments differed between teachers and to some extent were informed by the specific subject the teacher taught.

One such example of an individual adjustment utilised by Julie and Sarah was giving hyperactive students jobs to positively channel their energy. This reflected a consistent sense that teachers attempted to direct students towards positive behaviours.

The adaption techniques used varied in complexity and resources used. Some teachers spoke of easily utilised techniques with minimal resources, such as Julie who explained that she would use a whiteboard and 'fiddle toy' with hyperactive students. These items would simplify communication and provide a physical outlet for hyperactivity. However, Michael referenced a much more expensive method of adjustment. He would give a student with poor communication skills a Chromebook with simplified worksheets.

Sarah said that for the management of poor communication skills they would be reliant on the school system scaffolding the student before the lesson, with simple resources used in a lesson for adaption:

"Hopefully, the school would provide some support for that student... If not possible, I would find ways in which they feel comfortable to communicate, e.g., use of coloured cards to represent different things... If communication were an issue with other students I would try and pair up with a student they are comfortable with."

Emma, however, stated that to manage a student with poor communication skills she would adjust the method she communicated with them in class:

"... the strategies I use... are using simple gestures/signs. Giving pupils appropriate time to process and articulate their answer... using timers etc... Simply requiring them to point."

Finally, one of the frequently referenced methods for adjusting students to the classroom was capitalising on positive relationships with teachers acting as advocates for struggling pupils. Sophie said that they would look for opportunities to provide genuine

praise and facilitate a good relationship with the students' guardians in addition to utilising positive relationships pupils may have with other staff members:

"... look for opportunities to praise but try not to make it superficial. For me, the key with this one is building a relationship with home. Passing on nice comments to a member of staff that the child does trust can help... restorative conversations."

Sophie elaborated on this further and referenced being a mediator in facilitating relationships between students, encouraging mentalisation and empathy. Other teachers took this advocacy for specific students further and integrated a multidisciplinary approach to adapting students to the classroom. For example, Sarah said that she would:

"... work with the SEND department to create ways in which the student feels comfortable with social interactions...."

If necessary Sarah also elaborated that students could be removed from the classroom context to the "base" to give students greater support that could not be offered in the classroom.

7.6 Behavioural Management Strategies.

Behavioural management strategies took the form of modelling, sanctions and rewards, therefore equating to social learning theory (Maisto et al., 1999) and positive/negative reinforcement. Modelling was usually offered as the primary strategy used by teachers for behavioural management. The underlying cognition that appeared behind this was that teachers can only reasonably expect their students to behave in a certain way if they demonstrate that behaviour themselves. Charlotte said that modelling gives them an example of how they should behave: "Basically, you want to be modelling to students how you want them to behave. There's no use being lethargic or stern if you want them to be enthusiastically going around talking to each other. Equally, a really hyped teacher expecting students to sit down and read for 20 minutes isn't going to work."

Indeed, Nicola said that teachers should always be role models. They should greet students at the door, be pleased to see them, prepared and focused on learning at all times. Modelling was even used by teachers for the management of specific behaviours in the classroom. Both Emma and Nicola said they would model how to make friends, politeness, kindness and forge template relationships with students for them to use with their peers.

Teachers would also utilise both positive and negative reinforcement strategies such as praise and sanctions. Positive reinforcement was used to affirm and encourage desirable behaviour and good academic progress. Conversely, negative reinforcement was used for the management of disobedience and non-compliance. Positive reinforcement, such as praise and reward, was always the preferred choice. Indeed, Samantha said that positive reinforcement is achieved through making positive phone calls to parents and family, praising the right behaviour, sending postcards at home and making sure that they catch pupils doing it right. She much preferred this to focusing on the negative aspects of behaviour.

Positive reinforcement also extended to the pupils' responses to strategies to manage behaviour. Lisa said that if pupils responded well to their interventions and showed desirable behaviours she would praise and encourage this and ask them to share to the group for further validation from their peers.

As a last resort for behavioural management, negative reinforcement was used by teachers. If positive reinforcement did not work, Emma cited that de-escalation was preferred in their school before moving to negative management strategies. For example, Emma stated that in their school the "team teach" approach was employed to manage negative behaviours:

"... the approach prioritises de-escalation as a form of distracting the pupil away from the behaviours. It's about transforming the situations into learning opportunities... Deescalation is primarily 90% of the approach with 10% being potential punitive consequences – isolation etc..."

If teachers needed to resort to negative behavioural management, many referred to applying the school's behavioural policy. Sarah specifically explained that she would refer to the behavioural policy for the management of impulsivity:

"...Follow behaviour policy. And if that resulted in them leaving the class, that would have to happen... Wouldn't hugely impact the class as following the behaviour policy shouldn't affect the remainder of the class."

7.7 Classroom Dynamics.

Given the nature of the classroom and the function of group-based learning, teachers referenced class dynamics as useful to expose difficulties as well as supporting positive outcomes. Teachers referenced implicit methods of utilising classroom dynamics to their advantage. For example, when asked about the relationships between students and peers influencing learning, Sophie, Charlotte and Alice all said that they would make use of pupil premium by seating different abilities together. This was done to capitalise on higher ability students helping lower abilities and supporting those with atypical behaviours such as poor communication skills.

Michael like Sophie, Charlotte and Alice also mentioned the use of students in the class as tools for managing classroom performance:

"... When grouped together pupils will complete work to a high standard when they support one another... having a shared team effort towards an end goal usually results in good learning."

The dynamics in the classroom contributed to the overall atmosphere during the lesson. The class atmosphere and how pupils feel in class was frequently referenced as being pivotal to good classroom functioning. Teachers specifically referenced feelings of safety or competition. A feeling of competition was referenced by teachers as influential in learning. Alice said that competition between peers is healthy and encourages learning, with Rachel also referencing a feeling of competition as particularly beneficial for managing inattention and distraction. Although competition was deemed by some teachers as important and beneficial, feelings of safety were much more prevalent and emphasised by the teachers interviewed. Specifically, teachers said that pupils who feel safe in class are inspired to learn. Charlotte contextualised this feeling of safety as conduciveness to learning in her subject of foreign languages:

"... Speaking tasks need students to be comfortable enough in the lesson to be able to speak to each other without getting embarrassed, which can only really be done by making sure from day 1 that they know mistakes are fine..."

This feeling of safety permeated the management of behaviour. Julie said that for children with additional considerations, such as poor social interaction skills, there would be an emphasis on routine to foster a feeling of safety, and hopefully facilitate engagement. Alice outlined that class atmosphere affects all students, not just those with specific considerations or atypical behaviours. She noted the need to consider the needs of all students and the atmosphere in class when managing atypical student behaviour: "I also find students who witness poor communication between student to teacher or student to student – feel uncomfortable and then do not complete tasks to the best of their ability (I'm thinking about my bottom set Y9's here)."

7.8 Classroom Assistance.

This theme relates to the various support that teachers utilised in class. Classroom assistants were the most commonly referred to as the preferred and required form of support, although the terminology may differ from teaching assistant to learner support assistant between the teachers interviewed. Classroom assistants were deemed pivotal to the ability of the teacher to meet their lesson plans. Consequently, their absence was keenly felt. When asked about the most challenging aspects of managing a class, Alice said that in her discipline (art and design) the lack of an assistant can mean that the entire lesson is thrown off track. However, due to budget constraints, she rarely has such assistance. Samantha echoed this when asked about the difficulties in managing a class of students and expressed that the lack of an assistant made this especially difficult:

"The hardest class to manage are the ones are the big groups of 30-32 that have lots of needs with no LSA presence, particularly late in the day."

Furthermore, according to Michael, classroom assistants were important in supporting students with atypical behaviours in the classroom, including the management of communication issues:

"... if we are talking about a specific student who finds it difficult to communicate on a personal level I would usually ask a teaching assistant (if available) to work with the pupils for small portions of the lesson to help them if possible."

7.9 Time

The lack of time teachers had with their students was a major theme that was related to numerous factors. Time can shape the response a teacher makes. For instance, teachers would judge what would be a suitable time to spend reprimanding disturbances in the classroom. As a result, they tended to only intervene if the intervention was less disruptive than the disturbance. When asked about the management of impulsive behaviour, for example, Lisa said:

"... 'low-level impulses' can be strategically ignored if they have not been distracting... as it may be more disruptive to provide the conduct marks and deal with the students' reaction."

The time to manage more complex behaviours in the classroom was also a consideration as teachers only have students for a limited time during which they have to meet educational outcomes. For example, when Charlotte was asked about what behaviours she found the most difficult to manage she said:

"... What I mean by that is, low-level disruption is definitely the most prevalent form of disruption in a lesson but most of the time it can be quashed quite easily and without a fuss, but if a student continues regardless or outright and deliberately carries on, I find that that causes more difficult[y] because, of course, you have to give more lesson time over to that child. And essentially it's a lack of time that makes everything difficult."

7.10 Summary

To summarise, the narrative presented by teachers is one of an environment that is tailored towards specific traits such as enthusiasm or resilience. Deviation from these behaviours into more atypical or maladaptive domains is considered by teachers to be indicative of SEND and managed according to SEND regulations through behavioural management strategies and individual adjustments. However, implementing these strategies involves wider considerations around resources/support, time and classroom dynamics. This, therefore, results in a situation where a teacher is obligated to support students according to an existing framework with reported limited time and resources to do so while also considering the needs of the wider class. Thus, to conclude, it is perhaps best to explain the role of teachers as one of "spinning plates", attempting to balance the needs of competing demands and student needs.

Chapter 8 - Discussion of the Teacher Themes in the Interpretation of Student Behaviours in the Classroom

8.1 Orientation

In this section, analysis of teacher interviews will be discussed with reference to previous research. The qualitative phase of this doctoral thesis aimed to explore teachers' perceptions and management of ADHD behaviours, social and communication difficulties of Autism and attachment characteristics. This complemented the quantitative phase that demonstrated the relations between ADHD behaviours, social and communication difficulties of Autism, attachment characteristics and academic self-concept and general self-esteem. The quantitative phase demonstrated a relationship between the variables, but it did not explain why such relations occurred. However, teacher interviews further illuminated the relations between ADHD behaviours, Autistic traits, attachment characteristics and the academic selfconcept and general self-esteem through a critical realist, retroductive method. This is due to the self-concept being informed by feedback from teachers. It is argued that much of this occurs in the classroom as a response to student behaviours. Consequently, previous research has demonstrated that teachers are particularly fundamental sources of feedback in the construction of the self-concept (Bouchey & Harter, 2005; Marsh & Hau, 2004; Spinath & Spinath, 2005). The teacher interviews, therefore, aimed to provide a further understanding of ideal student behaviour and how teachers interpret and manage atypical student behaviours in the classroom.

8.2 Discussion

Before proceeding to discuss the data analysis, it is important to discuss the context in which interviews were undertaken. First, the teachers interviewed in this doctoral thesis all worked in secondary schools. Therefore, the findings of this qualitative cannot be directly applied to the findings of the LI-SEM project, as the teachers were not sixth-form college teachers or the specific teachers of the student sample used in the LI-SEM research. Regardless, the themes identified in the qualitative phase of the research by secondary school teachers align with the LI-SEM project and may be illuminating. This is because both sixth-form colleges and secondary schools offer very similar academic contexts. In addition to this, the Teachers' Standards (Department for Education, 2013) and SEND Code of Practice (Department for Education & Department for Health, 2015) implicitly referred to by secondary school teachers apply to all teachers regardless of the student cohort. In addition to this, it can be reasonably assumed that the presence of ADHD behaviours, social and communication difficulties of Autism and attachment characteristics are temporally stable and would have been present during their secondary school years. Therefore, their relatively recent experience of secondary school teachers' approach to behaviour management, could still be influential on their self-concept. Thus, the themes identified from the interviews with the secondary school teachers are assumed to provide sufficient insight into the management of these behaviours in an academic setting, regardless of context.

Second, all research participants worked in relatively deprived areas according to the English Indices of Deprivation (Ministry of Housing, Communities & Local Government, 2019). This has implications for student behaviour as deprivation is associated with the behaviours explored in this thesis. It has, for example, been linked with lower perceived parental warmth in attachment (Stansfeld et al., 2008). There is also evidence of an increased risk of externalising problems in children with ASD (Midouhas et al., 2013). Further, the prevalence of ADHD diagnosis in deprived areas of England is double that of the least deprived (Prasad et al., 2019) and evidence of SEND being closely related to poverty both as a result and a cause (Shaw et al., 2016). The frequency of SEND and atypical classroom behaviours in deprived areas, therefore, suggests that the teachers interviewed may have to

deal with more frequent atypical classroom behaviours such as Autistic traits or ADHD behaviours. Frequent teacher exposure to atypical classroom behaviours would therefore likely influence how they interpret and manage these said behaviours. This in turn could mean that as the teachers are more likely to experience SEND behaviour, they are more likely to consider the behaviours they were interviewed on as evidence of SEND. This, therefore, could have contributed to the SEND focus detected throughout the teacher interviews.

Third, it is possible that the teachers' past training and government legislation such as the SEND Code of Practice (Department for Education & Department for Health, 2015) and Teachers' Standards (Department for Education, 2013) informed the teachers' perception of students' behaviours, and therefore their answers in the interview. As the Teachers' Standards (Department for Education, 2013) directly inform and instruct teachers on expected functioning in their role, it is appropriate that this informed the answers given when asked about the management and perception of student behaviours. Indeed, the three contextual factors (introduced in Section 7.2) of SEND, educational outcomes and high expectations/positivity which were found to permeate the themes identified can be directly linked back to specific Teacher's Standards (Department for Education, 2013). "Teachers' Standard 1, High Expectations" is associated with notions of positivity, "Teachers' Standard 2, Progress" is linked to educational outcomes and "Teachers' Standard 5, Adaptive Teaching" can be related to SEND.

Fourth, the interviews with teachers about their interpretation and management of secondary school students are indicative of the self-concepts that sixth-form students will have. Indeed, the reponses both positive and negative from secondary school teachers to students over the period of the students secondary school career will inform the self-concept they have when they enter into sixth-form college.

When the teachers were asked about what they needed from students, they tended to focus on both enthusiasm and resilience. Although these were not behaviours as such, they can be indicated in behaviours such as task perseverance or engagement. According to the teachers, enthusiasm was conducive to academic functioning as it predicted engagement in the lesson. Therefore, to some extent, teachers conflated enthusiasm with motivation. Despite this, the importance of enthusiasm to academic functioning is consistent in educational research. Previous studies have shown that student motivation is related to engagement in education (Nayir, 2017) and that self-reported positive engagement is significantly associated with positive outcomes (Frensley et al., 2020). Although enthusiasm is predictive of academic functioning and engagement, the teachers interviewed in this thesis saw enthusiasm as a continuum. Tellingly, they saw both high and low enthusiasm to be potentially problematic in the classroom. It is important therefore to consider what high and low enthusiasm may look like in the classroom and why they may be difficult to manage. High motivation could be manifest as excitability and excessive talking in class, which have been identified as examples of disruptive, challenging behaviours in both the Below the Radar report by OFSTED (2014) and research by McCready and Solloway (2010). Lack of enthusiasm, on the other hand, could be seen as indicative of non-engagement in the class and failure to follow or complete tasks. Lack of motivation to follow instruction has been highlighted by Bennett (2017) to be adversely related to teacher well-being, retention, time, material resources and working conditions. Therefore, both high and low enthusiasm in the classroom can be problematic because they disrupt classroom flow and functioning, and/or create barriers to engagement.

Resilience was the second quality identified by teachers interviewed in this doctoral thesis. In past research, resilience has frequently been demonstrated as beneficial in the classroom, increasing the likelihood of academic success, despite the student-facing adversity

within or outside the classroom (Moore et al., 2021). Arguments for the positive impact of resilience in education outlined in past research is consistent with the accounts of the teachers interviewed in this thesis, who expressed its importance in academic functioning. Resilience was conceptualised by the teachers interviewed as a constructive response to both adverse feedback and failure. Negative feedback is perhaps an inevitable feature of many young people's educational journey. A teacher's role is not only to teach but also to manage the classroom. As such, they may have to provide academic feedback that is negative, for example, the award of poor grades. They may also be compelled to sanction a student for being consistently unruly. Some students will experience frequent negative feedback. Indeed, those who demonstrate ADHD behaviours are more likely to be the subject of negative behavioural strategies (Loe & Feldman, 2008). Therefore, for these students, greater resilience would be beneficial in maintaining engagement in lessons and weathering any adverse teacher interventions.

While teachers mentioned enthusiasm and resilience as specific desirable traits of students, they were not highlighted as techniques for the management of atypical behaviours such as ADHD behaviours or Autistic traits. The methods of managing the behaviours investigated in this thesis were individual adjustments and behavioural management strategies. Individual adjustments represent the in-class changes a teacher could make to support a student in their academic functioning and enable their success. This reflects Standard 5 (adaptive teaching) referenced in the Teacher's Standards (Department for Education, 2013), and is considered particularly necessary for students with atypical behaviours, who are often considered to be SEND. The behaviours associated with ADHD, social and communication difficulties of Autism and maladaptive attachment characteristics may be considered SEND due to the definition found in the SEND Code of Practice (Department for Education & Department for Health, 2015). This stipulates that a special

educational need is "a significantly greater difficulty in learning than the majority of others of the same age" (p. 16). In past educational research, individual adjustments have been a common theme relating to SEND in classrooms specifically. Research by Finkelstein et al. (2021) outlined three specific themes related to individual adjustments, including organisational practice (making the classroom accessible for all students), instructional practice (how lessons were constructed to make the content accessible to all) and social, emotional and behavioural practice (how teachers adjusted their practice to meet the social, emotional and behavioural needs of all learners). These themes identified in Finkelstein et al.'s (2021) research relate directly to some of the strategies mentioned by teachers interviewed for this thesis. Examples include giving students jobs to appropriately channel and support hyperactivity in the classroom, or the strategic placement of students in the class to capitalise on positive peer relations to support struggling students.

Behavioural management strategies were an alternative to individual adjustments. The behavioural management approaches outlined by the teachers interviewed tended to focus on positive strategies including modelling, rewards and praise for example. However, if these failed to achieve the desired outcome, teachers would escalate their response strategies to impose sanctions or implement the schools' behaviour policies. Past research in education has highlighted that this preference for positive management strategies, with gradual escalation if necessary, is common among teachers. Positive, relationship-focused behavioural interventions such as hinting and modelling are appropriate, adaptive and successful in the classroom. Therefore, they are preferable as a first-line response to student behaviour (Roache & Lewis, 2011). Indeed, McCready and Soloway (2010) quoted a teacher as saying "if you expect the child to understand, have some concept of empathy you have to start yourself modelling it..." (p. 118). Critics have argued that some positive behavioural strategies, such as self-oriented praise, rarely contribute to any positive or meaningful change

in functioning in the classroom (Hattie & Timperley, 2007). Nonetheless, positive behavioural strategies remain a preferred option for teachers, as reported in the literature because of the positive effects they have on student behaviour (see Browne, 2013; Närhi et al., 2017). This view was replicated by the teachers interviewed for this and other research. This is most likely due to the negative outcomes that can arise from negative behavioural management strategies. These may include a reduction in student incentive to comply with classroom norms, which may create a cycle of disobedience and punishment (Singh, 2011). Likewise, they can lead to further disobedience and disruption by the student if the teachers' reprimand is viewed as unfair, insensitive or negligent (Miller et al., 2000; Tirri & Puolimatka, 2000; Wentzel, 2002).

Themes of enthusiasm, resilience, individual adjustments and behavioural management strategies demonstrate that teachers are faced with varied student behaviours and traits in the classroom. All of these behaviours and traits are either adaptive or maladaptive, requiring either management or support from the teacher to facilitate successful classroom functioning and meet educational aims. However, the teachers interviewed frequently referenced how the challenge of managing and supporting students was exacerbated by a lack of classroom assistance. Attempting to balance competing demands in the classroom is difficult to achieve alone. As such, a classroom assistant, who could devote time and energy to those students in the class who were struggling, was deemed important. This mirrors the findings of the recent independent review of behaviour in schools by Bennett (2017). This found that half the 1,700 teachers surveyed felt that there were inadequate resources in their school for the management of student behaviour. Arguably, recent cuts in school budgets may have exacerbated this situation (Williams & Grayson, 2018). Concerns over a lack of support for teachers in school have been a consistent feature of educational research for some time, for example, Margot and Kettler (2019) and the earlier work of Axup

and Gersch (2008) reported that teachers felt there was a lack of available practical support in the classroom, ranging from both peer collaboration to institutional/council support. The persistence of these concerns may indicate that teacher work demand is simply too much to be easily achieved, regardless of recent budget cuts. This would outline a need for more resources and support for teachers to adequately support the diversity of student needs and behaviours in the classroom.

Time was consistently portrayed by teachers as both an outcome and predictor of the other themes identified in the interviews, particularly classroom assistance, individual adjustments and behavioural management strategies. Indeed, the OFSTED (2014) highlighted that disruptive behaviour, such as ADHD behaviour or maladaptive attachment characteristics, is endemic in the UK's classrooms, leading to a loss of learning time that was concerning to teachers and parents/carers. The behavioural management strategies and individual adjustments cited in interviews are methods of managing disruptive behaviour and reflect good practice identified in past literature as proactive planning for engagement (Nagro et al., 2019; Siperstein et al., 2011). While implementation of behavioural management strategies and individual adjustments can limit classroom disruption and therefore save learning time, they still eat away at valuable time and resources. Despite this, the benefits of implementing tactics in supporting student behaviour are potentially quite significant. Bennett (2017) argued, in his independent review of behaviour in schools, that good behaviour in the classroom is associated with better teacher well-being and saving time and resources.

Teachers also have to consider classroom dynamics. This reflects the need for teachers to respond to the whole group rather than individuals. Managing dynamics was a specific area of consideration for the teachers who were interviewed in this study. Classroom dynamics were often managed and capitalised on by teachers to avoid using more resourceintensive, one-to-one behavioural management strategies and individual adjustments. Capitalising on classroom dynamics where possible was an intelligent way of supporting students in the context of limited resources. Teachers referenced many strategies that fostered feelings of safety to encourage engagement and support behaviours that could cause students to struggle in the lesson. Teachers also referenced the value of competition, highlighting that camaraderie and competition between peers could facilitate improved academic functioning and lead to better academic outcomes and therefore meet the "Making Progress" Teacher's Standard (Department for Education, 2013). Competition in the classroom could relate to social comparative processes whereby students compare themselves with others' performance. Upward comparison between the self and better performing peers has been suggested to raise motivation to achieve better due to increased feelings of self-confidence and self-efficacy from success. Indeed, perceiving oneself as being better than their peer(s) increases self-esteem, reduces anxiety and creates positive affective states (Dijkstra et al., 2008). However, while competition can lead to positive academic behaviour and functioning, it may also be a risk to some students who struggle to compete or continually underperform. No matter how hard some struggling students try, they may never be able to compete or achieve to the same level as better-performing peers. As such, these struggling students are instead consigned to a cycle of negative feedback and unpleasant social comparative processes with their more academically able peers (see Marsh & Hau, 2003; Marsh & O'Mara, 2008; Marsh & Martin, 2011; Tracey & Marsh, 2000).

References to safety in the classroom align with common themes in the literature around trauma and culturally sensitive educational practice. Indeed, the work by Bell et al. (2013), Brunzell et al. (2015) and Minahan (2019) all reference the need for safety and belonging in the classroom to support students and foster growth. The fact that teachers identified the classroom climate as an important theme in student behavioural management demonstrates an understanding that student behaviours can be a response to their environment and their own experiences. For example, disruptive behaviours such as hyperactivity and impulsivity can arise from and even be exacerbated by inaccessible content in lessons (Cothran et al., 2009). This aligns with awareness in the teachers in this study who recognised how their actions influence the environment in the classroom and their students' behaviours.

Regarding answering the third research question of this doctoral thesis, teachers' management and perception and management of ADHD behaviours, social and communication traits of Autism and attachment characteristics appears to be informed by wider contextual issues and educational guidance. Indeed, teachers frequently referenced issues around time influencing their responses to student behaviour and their responses being in line with current educational practice as stipulated by the SEND Code of Practice (Department for Education & Department for Health, 2015) and the Teacher Standards (Department for Education, 2013). Further examples of teachers' management and perception of ADHD behaviours, social and communication traits of Autism and attachment characteristics can be in their reference to the need for classroom assistance to provide support for not only these students but also the entire class due to issues around time. Furthermore, the dynamics of the classroom informed their own attempts to tailor support to these individuals, providing either feelings of safety or competition to attempt to support students.

8.2.1 Conclusions

To conclude, the themes identified by teachers interviewed in this doctoral thesis are commonplace in educational research. It is apparent that teachers' management of atypical student behaviours such as ADHD behaviours, Autistic traits or maladaptive attachment characteristics are in line with the current guidance and are positive and supportive in nature. However, it could also be possible that the behavioural management strategies and individual adjustments teachers carry out to support children have unintended consequences. Indeed, as referenced earlier, students with atypical behaviour who are more likely to receive negative feedback and have a negative self-concept may view these very differently than the teacher, therefore leading to further negative effects on the self-concept. In addition to the potentially negative repercussions of the adjustments and strategies used by teachers, there is the added consideration that these techniques are closely related to the classroom dynamic, resources and time that a teacher has. Therefore, posing extra considerations on the usefulness and appropriateness of these interventions. Thus, it appears that teacher responses and conceptualisations of student behaviour are largely informed by their role, training and the school environment/climate, with responses to student behaviour perhaps unintentionally more harmful than good.

Chapter 9 - Synthesis of Quantitative and Qualitative Findings

9.1 Orientation

The findings of the quantitative and qualitative phases of this doctoral thesis have been discussed in previous chapters. In line with the mixed methods approach, this chapter will synthesise ideas developed from these phases through critical realist retroduction. To do this, the themes outlined in the teacher interviews will inform the interpretation of the findings of the LI-SEM study in order to make assumptions about causation, in line with critical realist philosophy.

9.2 Synthesis

The quantitative phase of the research demonstrated that ADHD behaviours, social and communication difficulties of Autism and attachment characteristics predict the academic self-concept and general self-esteem of sixth-form college students, with some additive effects present. The presence of additive effects between ADHD behaviours, social and communication difficulties of Autism and attachment characteristics indicates that in cases of co-occurrence there is a greater effect on the academic self-concept and general self-esteem than in cases of single manifestation. This phase was complemented with a qualitative phase that sought to understand how teachers respond to these behaviours. This was based on interviews with a small sample of secondary school teachers. The motivation for this phase was that self-concept is informed by teacher feedback. It follows that this will be informed by their perception and management of these behaviours. The decision to interview only secondary school teachers was based on the fact that the self-esteem of students will be grounded in their long-term educational experience, the majority of which will be in secondary school. Therefore, analysis of secondary school teachers' responses to ADHD behaviours, social and communication traits of Autism and attachment characteristics will allow some inference of causality, in line with critical realist methodology.

The qualitative phase presented a picture of teachers attempting to support students using either behavioural management strategies or individual adjustments. However, the use of either behavioural management strategies or individual adjustments is dependent on the teachers' assumption of the origins of the behaviours/qualities. Specifically, whether the hypothetical student behaviour/quality is of a SEND origin/nature or not. Behavioural management strategies and individual adjustments are just some forms of either positive or negative feedback demonstrated by teachers that may influence students' self-concept as they may be interpreted as positive or negative feedback (Bouchey & Harter, 2005; Gniewosz, 2010; Gnieswosz et al., 2012; Spinath & Spinath, 2005). The responses from the teachers interviewed to relevant student behaviours were overwhelmingly positive in nature, and therefore can be considered to be intended as positive feedback. They were aimed at
supporting students' functioning and creating safe and adaptive environments for them to succeed. This contrasts past research that suggests that students who demonstrate disruptive, externalised behaviours, such as those associated with ADHD, attachment issues or Autism, often experience more negative responses from teachers (Loe & Feldman, 2008). Furthermore, it also contrasts the findings of the LI-SEM which possibly suggest that students get more negative feedback due to their behaviours to explain the predictive nature of ADHD behaviours, social and communication difficulties of Autism and attachment characteristics in relation to the academic self-concept and general self-esteem (as referenced in Section 5). Therefore, this suggests that the teachers interviewed in this thesis demonstrate a more contemporary outlook, informed by more recent changes in training and legislation such as the Teacher Standards (Department for Education, 2013) and the SEND Code of Practice (Department for Education & Department for Health, 2015).

If we accept that this change in teacher outlook is indicative of the responses sixthform teachers would demonstrate, the negative relations demonstrated between ADHD behaviours, social and communication difficulties of Autism, attachment characteristics and the academic self-concept and general self-esteem might be unexpected. A more straightforward assumption would be that the negative self-concept evident in those with ADHD behaviours, social and communication difficulties of Autism and attachment characteristics is more likely to be an outcome of adverse feedback from teachers. However, the findings of this thesis suggest that positive responses from teachers may be linked to a negative relation between the behaviours under investigation and academic self-concept and general self-esteem. While seemingly contradictory, closer scrutiny may offer some insights. Interpretation of events and others' behaviour is likely informed by our experiences and our internal working model. For example, information received is interpreted through 'lenses' that are shaped by our experiences (Goethals et al., 1991; Hattie & Timperley, 2007). These can affect interpretation due to a 'confirmation bias' that confirms preconceptions. Indeed, research has demonstrated that individuals attend more closely to information that confirms their self-concept and orchestrate events and environment to gather additional self-affirming evidence (Hattie & Timperley, 2007; Swann & Hill, 1982). Consequently, students who are used to receiving negative feedback such as those with ADHD behaviours or Autistic traits (Loe & Feldman, 2008), tend to interpret positive feedback as being negative and are more likely to attend to potentially negative information that confirms their existing self-concept.

The interpretation of positive feedback in a negative way could explain why the positive teacher feedback demonstrated in this thesis could be linked to a worse academic self-concept in students with atypical behaviour. For example, if we consider the positive adjustment suggested by Michael (as referenced in Section 7.5) of giving a struggling student a simplified worksheet, this is a positive adjustment designed to support the student. However, it could be interpreted by a student as indicative of the teacher having little faith in their ability to achieve without adjustments. The student would then internalise this adjustment as a message of poor ability, rather than as an acknowledgement of difficulty in accessing material. Moreover, when students consider adjustments in comparison to others, they can see the difference in approach. Comparison with others is a fundamental element of self-concept formation. It is unavoidable and, arguably, the entire classroom structure and emphasis on performance lends itself to social comparison (Levine, 1983; Skaalvik & Skaalvik, 2002). This could explain why seemingly positive individual adjustments or behavioural management strategies for a presumed difficulty or "SEND" could have an adverse effect and therefore lead to the negative predictive effect demonstrated in Section 5 that ADHD behaviours, social and communication difficulties of Autism and attachment characteristics were demonstrated to have on the academic self-concept and general selfesteem.

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There is also an added consideration of what the adjustments and strategies for struggling students mean for other children in the class. In the same way that the struggling students may interpret these as a signal of weakness, fellow students may see them in the same way. Differences in the classroom can be looked upon negatively by the student cohort. Research by Diaz (2010) and Rullo et al. (2017) outlined that students who are perceived to be different are usually excluded from the classroom social group. Social exclusion comes when there is a lack of a bond between students. This bond requires all students to view themselves as equal (Bagwell, 2004). Thus, the problem with neurodiverse students in a neurotypical class is that they are not perceived to be equal to other students in the class, perhaps due to the interventions given to support them.

The unintended consequence of behavioural management strategies and individual adjustments used in class may explain the negative relation between the variables. However, some teachers referenced moving students both within the classroom and out of the classroom context as a means of support. Teachers would move students in the classroom to capitalise on the dynamic and atmosphere and use other students to support struggling students. The intention is that the movement of a lower-performing student to a better-performing one may mean the better performing student helps the struggling one or instead fosters feelings of competition, driving the struggling student to work harder. However, it can also lead to more disadvantaged students upwardly comparing to individuals whose ability they will not be able to match. This could lead to a cycle of perceived failure and worsen academic self-concept. In this case, teachers moving neurodiverse students to sit next to peers above their ability level could have an adverse outcome on academic self-concept.

Alternatively, moving students out of the classroom context entirely involved a change of paradigm from in-class support to support provided in an alternative environment or context. Changing the context a student is in also changes the frames of reference available

for comparative processes, and therefore has implications for the self-concept. Past research has demonstrated, for example, that moving intellectually disabled children into a special needs class leads to a higher academic self-concept than placing them in a regular class (Tracey & Marsh, 2000) and further in the "Big-Fish-Little-Pond Effect" (as referenced in Section 2.4.1) by Marsh et al. (1987). However, while the movement of students between regular and special class contexts is perhaps beneficial in the long term, the initial act could cause an acute, negative impact on the self-concept as the students could perceive that the movement is due to poor ability and assimilate this information into the self-concept.

To conclude, the negative relations between ADHD behaviours, social and communication difficulties of Autism and attachment characteristics demonstrated in the quantitative phase of this could result from a negative interpretation of the positive teacher interventions. Although these are envisioned by teachers to be supportive, they may be seen to indicate weakness or failure.

9.3 Thesis Limitations

As with all research, there are some limitations evident in this thesis. The first limitation evident is the failure to appropriately identify the factor structure of the AQ-10 (Allison et al., 2012), as referenced in Section 4.2. In retrospect, it would have been more appropriate to test the long-form adolescent instrument, the AQ-50 (Baron-Cohen et al., 2001) through confirmatory factor analysis before use in the LI-SEM study. If the AQ-50 would have been tested it would have been possible to develop a coherent instrument from the greater number of items present. Despite this, it would be difficult to source adolescents who would voluntarily sit through a cognitive interview of an instrument with 50 items and then proceed to complete the instrument for the confirmatory factor analysis. Therefore, despite the flaws with the factor structure of the AQ-10 (Allison et al., 2012), it was the most

appropriate instrument to be selected for validation. The inability to determine that the AQ-10 (Allison et al., 2012) appropriately measured Autistic traits led to the instrument being reduced to the point of only measuring the social and communication difficulties associated with Autism. This meant that it was impossible to test the relation between Autistic traits as a whole to the other variables and as such the LI-SEM project was only able to explore the relations between social and communication difficulties of Autism specifically in relation to the other variables.

An additional limitation of this thesis is the fact that the entirety of the schools and sixth-forms used in the sample were in some of the most deprived areas of the UK (Ministry of Housing, Communities and Local Government, 2019). These areas also had some of the lowest percentiles for accessing higher education according to POLAR4 scores (Office for Students, n.d.). A culture of infrequent progression to higher education could contribute to the scores pupils gave for academic self-concept and therefore result in lower academic selfconcept scores in the overall sample. Infrequent progression to higher education would not necessarily contribute to the relationship between ADHD behaviours, social and communication difficulties of Autism, attachment characteristics and the academic selfconcept and general self-esteem. However, the deprivation of an area may contribute to the manifestation of externalised behaviours in children and adolescents. Indeed, deprivation has been associated with problems with attachment (Stansfeld et al., 2008), ASD (Midouhas et al., 2013) and ADHD (Prasad et al., 2019), therefore suggesting a commonality of Autistic traits, ADHD behaviours and maladaptive attachment characteristics in deprived areas. Local deprivation could therefore have fed into the teacher interviews as teacher responses and interpretation of student behaviour were informed by contextual issues such as immediate school environment and relative area deprivation. Furthermore, local deprivation could also account for higher incidences of ADHD behaviours, Autistic traits and maladaptive

attachment characteristics within the sample. This would be difficult to determine without comparison with a non-deprived sample as elevated levels of ADHD behaviours, Autistic traits and maladaptive attachment characteristics within the sample would be the norm and therefore difficult to ascertain that this was not typical of the wider population.

In addition to the influence of deprivation, there is a clear gender imbalance in the nature of the population of the LI-SEM study with more female than male participants. This is due to evidence of a sex imbalance in terms of how ADHD and Autistic traits may manifest, with male manifestation more common (Loke et al., 2015; May et al., 2019; Mowlem et al., 2019), this could mean that there is an under-representation of more/less prominent and problematic variants of these behaviours and traits in the sample. In addition to the gender imbalance, there is also an age skew due to the research focusing only on adolescents. However, to focus on children is to potentially explore the self-concept while it is still developing, indeed, research has demonstrated that the self-concept becomes more established with age following exposure to greater amounts of feedback and information (Marsh, 1990a; Marsh & Shavelson, 1985). Therefore, adolescence was the most appropriate time in which to explore the role of teacher feedback, the self-concept and its relation to ADHD behaviours, Autistic traits and attachment characteristics.

As an additional note, all teachers included in the sample were secondary school teachers at mainstream Northern schools in the UK. All of the secondary school teachers interviewed were between 25 and 45, representing a young to middle-aged age bracket. Younger teachers aged 22-25 were newly to recently qualified and as such were operating without the extensive experience of classroom management and pupil engagement. Inversely, older teachers in the cohort were likely to be operating from an older framework of teacher training. There is also a clear limitation in the lack of student voice in the qualitative element of this thesis. The logic behind interviewing teachers, as the providers of feedback, is sound.

However, the absence of the student voice in the research means that the students have not had the chance to explain and outline how they perceived teacher feedback and the selfreported impact it had on them. Therefore, as outlined previously, the results of the teacher interviews and the speculated impact according to self-concept theory would benefit from corroboration through pupil reports.

The final limitation of this thesis is the impact of the COVID-19 pandemic on the qualitative phase. The need for social distancing meant that interviews were conducted using an online medium. Using an online medium rather than face-to-face interview methods could potentially render data less meaningful and responses less natural than during face-to-face interviews. Online interviews miss the non-verbal cues that are apparent in face-to-face interviews. Arguably, the fact that the interviews were analysed through semantic thematic analysis means that non-verbal sources of information would not have been included in the final dataset. However, it is possible that the interviewer may have reacted to these cues during the interview and adapted prompts and follow-up questions accordingly.

Davis et al. (2004) stated that "online and FTF (face-to-face) interviews should be viewed as distinct research forms with distinct but different attributes" (p. 951). While this may have been true at the time of publication, much of the criticism that Davis et al. (2004) raise may no longer apply to online data collection. Davis et al. (2004) argued that online interviews can be slow with inhibited flow of dialogue and that the use of colloquial, abbreviated and "text-speak" can lead to ambiguity. However, modern developments in technology and the widespread use of social media mean that online interviews can benefit from their own social cues, like emojis, to express nuances such as humour and sarcasm much in the way that face-to-face interviews do. Moreover, interviews in this thesis exhibited no examples of colloquial language or "text-speak", perhaps because respondents adapted the means of communication as naturally as they would in a conventional interview. Therefore, there is a clear contrast between the accessibility and use of online interviews historically and modern online qualitative research.

9.4 Chapter Summary

To summarise, the quantitative phase of the project demonstrated that ADHD behaviours, social and communication traits of Autism and certain attachment characteristics negatively predict the academic self-concept and general self-esteem of sixth-form college students with a summative effect present in some of the models tested (as outlined in Section 5.4 - 5.10). The findings of this project expand on past research such as the work of Doyle (2000), Foley-Nicpon et al. (2012), McCauley et al. (2018) and Nishikawa et al. (2010) who demonstrated that categorical models of ADHD and Autism and insecure attachment styles were related to the self-concept. However, the findings of this doctoral thesis have presented this understanding in a new light demonstrating that simply even the presence of the behaviours in a typical classroom cohort adversely relate to the self-concept. The found relations between ADHD behaviours, social and communication traits of Autism, attachment characteristics and the academic self-concept and general self-esteem were then used to inform interviews with secondary school teachers on their perceptions of student behaviours and their approaches to their management. As the self-concept is informed by feedback (as referenced in Section 2.4) teachers would be the primary form of feedback to student behaviour in education and as such it was appropriate to explore what ways teachers provided feedback to students demonstrating ADHD behaviours, social and communication traits of Autism and certain attachment characteristics. The identified themes from the follow-up, qualitative phase of this doctoral thesis demonstrated significant component themes that outlined potential explanatory factors as to why ADHD behaviours, social and communication traits of Autism and attachment characteristics related to the academic selfconcept and general self-esteem of students (if the themes from secondary school teachers

could reasonably be assumed to also extend to sixth-form college teachers). Specific themes of individual adjustments and behavioural management strategies represented the feedback teachers would give to students and demonstrated that teachers viewed behaviour from a SEND lens, which is in itself a deficit focused model of behavioural understanding in schools. that could be negatively interpreted by students.

Chapter 10 - Conclusion

To conclude, this doctoral thesis has demonstrated that ADHD behaviours, social and communication difficulties linked with Autism and maladaptive attachment characteristics are adversely associated with, and predictive of, the academic self-concept and general self-esteem of sixth-form college students. Furthermore, an adverse summative effect of the predictor variables on the academic self-concept and general self-esteem was also evident in some cases of co-occurrence. The subsequent qualitative project explored teacher perceptions and management of ADHD behaviours, social and communication difficulties of Autism and maladaptive attachment characteristics to provide potential insight into why the observed relation in the quantitative phase of the thesis may be occurring. Indeed, the emphasis by teachers on SEND behaviours, individual adjustments and behavioural management strategies were outlined as a potential factor in the relation between the predictor variables under investigation in this thesis and the academic self-concept and general self-esteem. These findings have been established through the exploration of the following research questions:

1) What are the relations between attachment characteristics, Autistic traits, ADHD behaviours and the academic self-concept and general self-esteem of adolescents in sixth form colleges in the UK?

2) Is there evidence of an interactive or summative effect in the relation between attachment characteristics, Autistic traits and ADHD behaviours to the academic self-concept and general self-esteem of adolescents in sixth form colleges in the UK?³

³ As referenced in Section 3.1, the absence of past research exploring ADHD, attachment and Autism as dimensional constructs in relation to the self-concept resulted in an inability to

3) What are teachers' perceptions and reported management styles of ADHD behaviours, social and communication difficulties of Autism and attachment characteristics exhibited by students in the classroom?

The quantitative phase of this doctoral thesis successfully answered the first two research questions. It offers a more nuanced approach to the understanding of how these concepts relate than has been the case in previous research. This reflects the observation that earlier investigation tends to focus on ADHD, Autism and attachment a discrete diagnostic categories. As a result, research typically comprised of samples of students diagnosed with ADHD/Autism or having specific attachment styles (Doyle et al., 2000; Foley-Nicpon et al., 2012; Hay & Ashman, 2003; Houck et al., 2011; McCauley et al., 2018; Nishikawa et al., 2010). The findings of the quantitative phase in this thesis present a new perspective. It looks beyond diagnosis to demonstrate that the simple presence of ADHD behaviours, social and communication difficulties of Autism or maladaptive attachment characteristics, has negative implications for the academic self-concept and general self-esteem. Therefore, ADHD behaviours, social and communication difficulties of Autism and maladaptive attachment characteristics, whether considered to be evidence of a clinical category or dimensional construct, can lead to an adverse relation with the self-concept.

The qualitative phase of this doctoral thesis successfully answered the third research question. When teachers were asked about their perception and management of examples of ADHD behaviours, social and communication difficulties of Autism or maladaptive attachment characteristics they tended to categorise these behaviours as examples of SEND. Teachers referred to individual adjustments and behavioural management strategies as

make an a priori hypothesis on the nature of the relations between co-occurring ADHD behaviours, attachment characteristics, Autistic traits and the self-concept.

specific techniques to support these behaviours. Notably, these approaches align closely with recommended conduct when dealing with SEND as per the Teacher Standards (Department for Education, 2013), the ITT Core Content Framework (Department for Education, 2019) and the SEND Code of Practice (Department for Education & Department for Health, 2015). It could be argued that these behavioural management strategies and individual adjustments, although overwhelmingly positive in intention, may signal to students that they are different and require additional support. As such, behavioural management strategies and individual adjustments could contribute to the relationship between ADHD behaviours, social and communication difficulties of Autism, maladaptive attachment characteristics and the academic self-concept and general self-esteem.

When atypical student behaviour is interpreted in a way that is conflated with a disability or indicative or a special educational need, this presents a vastly different interpretation than if the behaviours were just interpreted as natural behavioural divergence. The SEND model, according to Armstrong (2017), works from a deficit perspective, whereby an inability to perform is associated with a problem (a presumed disability/lack of capability or need). The SEND system works to remediate the said problem. This response can be seen in the current UK education system, which works on the assessment of students' abilities and the application of diagnostic labels (Department for Education & Department for Health, 2015). Indeed, a criticism of the current SEND system is its reliance on categories, such as speech and language problems or emotional and behavioural conditions. This is despite significant variation within these categories (Griffiths, 2020) and the tendency for difficulties to co-occur. The emphasis on the remediation of weakness and categorical model of difficulty is a feature of past research (see Griffin & Pollak, 2009). It is also reflected in the themes identified in the teacher interviews in this doctoral thesis. This clearly demonstrates the persistence of the SEND model in current practice, despite alternatives being available. Given

deeply ingrained, negative expectations associated with disability and special educational needs, young people who see themselves as being treated in line with SEND procedures may develop a worse self-concept. This would be due to the negative interpretation of the SEND feedback they receive from teachers and the reasonable adjustments made in class.

To bypass the potentially adverse relation between SEND and the self-concept, a paradigm change is needed. Interpretation of atypical student behaviours should not be through the lens of disability, but that of normal human difference and neurodiversity. In recent years, there has been a shift towards a neurodiverse perspective of education (see Armstrong, 2012a, 2012b, 2015, 2017; Griffiths, 2020) with greater recognition of social perspectives on disability⁴ in education and the relation of this to neurodiversity in education. A move from a deficit-based SEND paradigm to a strength-based neurodiverse view could offer a myriad of benefits for both students and teachers. It would capture those students who fall below the threshold of diagnosis and are unsupported in the current SEND system (Griffiths, 2020). Furthermore, SEND comes with connotations of disability and poor performance. This was evidenced in the work of Griffin and Pollak (2009) on neurodiverse students in higher education. They found that a prevalent theme associated with a neurodiverse identity was one of having a 'disadvantageous medical condition' that defined their identity with particular emphasis on their struggles. Having a negative view of oneself can act as a self-fulfilling prophecy. Even ascribing the SEND label is a form of adverse feedback that can adjust the self-concept and behaviour accordingly (see Rosenthal, 2010). Indeed, teacher expectations of students are often lower for those students who are SEND and

⁴ The social model of disability originally introduced by Oliver (2013) and further discussed by Levitt (2017) and Woods (2017) posits that individuals with disabilities are not disabled due to their impairment but by the barriers that society presents them with, which turns their impairments into disabilities. The social model of disability posits that rather than individuals changing, societal barriers must be removed to enable proper and successful functioning, much like the principles of the neurodiverse model of SEND behaviours in education.

inform their feedback and interactions with the student, which therefore influences the students' self-concept and further reinforces the teacher expectations as students adjust their behaviour to match their self-concept. Reframing this to a narrative based around strengths implicitly changes the message to one of capability and success. Research by Rubie-Davies and Rosenthal (2016) demonstrated that positive expectations lead to positive academic outcomes. Thus, movement from a deficit-based model of conceptualising student behaviour to a strengths-based one can potentially circumvent issues around negative feedback, self-concept and performance.

A change in paradigm from SEND to neurodiversity is not straightforward. The SEND approach focuses on remediating deficits in individuals, as demonstrated in the individual adjustments and behavioural management strategies teachers interviewed in this thesis outlined. Conversely, a neurodiverse approach emphasises strengths and changes in environment and context to enable an individual to succeed. It is far more complex to change the classroom context and school structure than it is to provide individual adjustments to the child. Armstrong (2017) suggested some potential roadblocks barring the way from a movement to a strengths-based model and understanding student behaviour. Firstly, special educators and parents may be resistant to a change in conceptualisation in SEND from deficits to positives and strengths. They may fear this could result in the loss of services designed to support students. Secondly, parents and teachers may worry that students will struggle to meet academic demands without adjustments to remediate weakness.

These two issues can be overcome through the protection of specialist services for those with diagnosed special needs while discarding the 'disability mindset'. In addition, removal of the 'one-size-fits-all' mindset of education, whereby all students must attempt to meet the same specific goals despite individual differences in capability.

10.1 Research Significance

The findings of this doctoral thesis are potentially significant, both in terms of the furthering of knowledge and the implications for teaching practice and supporting students. Before exploration in this doctoral thesis, the mechanisms of how co-occurring ADHD behaviours, adverse attachment characteristics and Autistic traits led to a greater experienced deficit were unknown, despite co-occurrence leading to greater deficit being frequently referenced in literature (Eyuboglu & Eyuboglu, 2020; Mychailyszyn et al., 2010; Newcorn et al., 2007; Sturm & Kasari, 2019). Through the findings of this thesis, it is clear that these phenomena do not moderate each other in relation to another outcome variable. However, there is evidence of an additive effect leading to the greater experienced impairment. This has implications for how we support students with co-occurring difficulties. It suggests that support needs to be tailored for the numerous difficulties than can co-occur and stepped to increase as experienced deficit increases, with greater support for those who demonstrate cooccurring difficulties such as ADHD behaviours and Autistic traits. In practice, this could simply be for those with ADHD behaviours to have more breaks in-between lessons or be provided with fidget spinners or more active roles in the class. Whereas for those with both Autistic traits and ADHD behaviours, this also incorporates "now and next" boards, whiteboards and pens for alternative communication forms (Moores-Abdool, 2010).

The findings of the interviews with teachers pose significant implications for practice as they suggest that the potentially positive interventions a teacher implements to support a struggling student could be interpreted negatively in the wider context. This, therefore, seems to suggest implementing some basic adjustments as standard for all students to make sure that struggling students do not perceive themselves to be different to their peers. Adjustments for all students in the classroom closely align with the principles of a UDL as suggested earlier in Section 2. This would provide greater benefit for all students in the class. However, making such wide-sweeping changes and amendments has both implications for cost, staffing and resourcing that may make this difficult to implement.

10.2 Recommendations

There are potentially many benefits associated with a change in paradigm from SEND to neurodiversity. It is important to consider what this change in paradigm means for the management of student behaviours in the classroom. Simply changing the paradigm is insufficient if it does not feed into how we then support student behaviours. The SEND approach focuses on adjusting and equipping the child to succeed, rather than implementing positive structural and environmental changes to create an environment in which all children can succeed, regardless of behavioural differences. Therefore, it is important to discuss how the change in conceptualisation and understanding of student behaviour has implications for the management of student behaviours in practice. Alternate, neurodiverse behavioural management strategies for teachers do exist and have been demonstrated to be effective. Indeed, research by Griffiths (2020) has outlined the benefits of neurodiverse training to teachers to manage student behaviours in a positive, strengths-based way. Following the delivery of training on supporting neurodiverse needs in the classroom and their management, 53.4% of teachers reported that student engagement increased and 44.5% of teachers reported improved student performance. Interviews with the teachers also revealed that they developed more multisensory approaches to learning for all students. This was done to support all students and avoid singling out any students and thereby posing an alternative to the usual SEND response of equipping specific children with the means to succeed. Further supporting evidence of neurodiverse behavioural management strategies in action are presented in a comprehensive article by Rentenbach et al. (2017). Rentenbach et al. outlined that for the management of student behaviour, teachers should presume competence rather than disability, promote positive affective co-regulation between staff and students and

integrate nonverbal communication strategies into teaching. This poses a contrast to the conventions of practice that were discussed in the qualitative phase. This assumed disability rather than specifically applying assumptions of competency to ADHD behaviours, Rentenbach et al. (2017) suggested that teachers manage their expectations on their ability to restrict hyperactivity, integrate routines into the classroom, provide intense stimulation and always provide unconditional positive regard and consistently have high expectations. These strategies for the management and support of ADHD and ASD in the classroom as suggested by Rentenbach et al. (2017) challenge the typical management strategies used by teachers, informed by a neurodiverse approach to understanding student behaviours and would have potentially greater benefits to student functioning in class.

Armstrong (2012) also suggested alternative, neurodiverse behavioural management strategies that teachers could use in practice. Teachers can collect positive strength information about students and compile these into inventories which they can use to support engagement in school tasks. This aligns with the aspirations of the teachers interviewed in this doctoral thesis, who attempted to "catch students doing it right" and focused on positive attributes. Furthermore, Armstrong (2012) also suggested a 'universal design for learning' where teachers remove barriers to learning for students with atypical behaviours in a way that also benefits everyone. For example, incorporating spell-checkers and speech-to-text software in all lessons. However, a 'universal design for learning' could be difficult to implement, requiring sweeping changes at a structural level for example universal text to speech softward or fidget cubes for all students. These wider changes however have cost and organisational implications that therefore may be outside of the capacity of the teachers to implement.

Despite the difficulties in the implementation of some of the neurodiverse strategies for behaviour management and student support, the benefits of a change from SEND to neurodiverse understanding demonstrates significant, positive changes for student performance and engagement. However, changing teachers' behavioural management strategies according to Rentenbach et al.'s (2017) examples are much easier to implement than the systematic changes required in the conceptualisation of SEND. Systemic changes are required to facilitate support for a wide range of student needs and behaviours across a limited, one-size-fits-all context such as a secondary school or sixth-form classroom. Barriers to the implementation of a neurodiverse, strengths-based behavioural management include time and a lack of resources to implement change. If teachers struggle to find the time to support students within a SEND framework, it follows that they would not have the time to support them in a neurodiverse approach. Secondly, the research in this thesis identified concerns over a lack of resources such as teaching assistants or technology. This would likely challenge a shift to a 'universal design for learning'. However, despite these difficulties, it is important to attempt to move towards a more strengths-based model of understanding and supporting student behaviour and recognising that behaviours can influence the self-concept at any level of manifestation. Recognition of these two factors could potentially have positive implications for teaching practice, student engagement and performance and the selfconcept.

Other recommendations from this research include reframing and adjustments of the ITT Core Content Framework (Department for Education, 2019) and Teacher's Standards (Department for Education, 2013). There is clear scope in "Teachers' Standard 1: High Expectations" and "Teachers' Standard 5: Adaptive Teaching" for neurodiverse friendly adjustments. Simply changing the language in Teachers' Standard 5 from special educational needs to differently-abled and emphasising the use of students' strengths to support areas of difficulties could amount to a significant change in teaching practice. Teachers' Standard 1 could be adjusted to be based more on neurodiverse principles through recognition that the

"safe and stimulating environment" for all students, looks differently per student dependent on needs and therefore, classrooms could be split into quads dependent upon needs, for example, an "Autism-friendly" zone with muted colours, sensory trays/mindfulness activities.

The movement towards neurodiversity in education is already happening both in schools and in higher education. However, this change is happening at different rates with some higher education institutions progressing much faster than schools, possibly due to larger autonomy in operation. Indeed, Chrysochoou et al. (2021) redesigned an engineering course at the University of Connecticut to be more inclusive through a strengths-based, neurodiverse framework. This redesign led to students having an improved educational experience, improved academic engagement and enhanced feelings of belonging and application of course concepts to real-world concepts. Furthermore, a UDL curriculum that supports neurodiversity has already been suggested by the Centre for Applied Special Technology (CAST, 2018) which posits four main components including differentiated student objectives and means to achieve them, differentiated and multiple methods of teaching, variability and flexibility in instructional materials and finally focus on the objective of learning and not the means to reach it with the elimination of barriers to learning.

The implementation of changes in the Teacher's Standards (Department for Education, 2013) would require further training and perhaps even specialist training for teachers to implement these changes into practice. Some training has been given to teachers in England on supporting neurodiversity in the classroom through a government-funded project with positive results. Indeed, research by Griffiths (2020) evaluated a teacher professional development project called "Teaching for Neurodiversity" which was delivered to teachers in both colleges and primary and secondary schools. The training aimed to give teachers a better understanding of human diversity in learning and strategies to meet the needs of students in their classrooms. Data from the evaluation demonstrated that teachers had significant improvements in their understanding of neurodiversity, support for neurodiversity, multisensory approaches to learning and metacognitive techniques. Furthermore, teachers reported a positive impact on their knowledge and skills in supporting neurodiverse learning needs in their classrooms. Therefore, although the implementation of neurodiverse framework changes in the Teacher's Standards (Department for Education, 2013) may require further teacher training, this has been demonstrated to be beneficial in improving teaching practice and supporting students in the classroom. Thus, one could argue that the potential benefits of such training and paradigm shift would outweigh the costs.

10.3 Future Research Recommendations

Although it is possible to conclude that there is a need and benefit in a strength-based model of assessing and supporting diverse student behaviours in the classroom, further research is needed to clarify this and support the findings of this doctoral thesis. To this end, future research should focus on determining if individual adjustments and behavioural management strategies are likely mediating factors between unique student behaviours and the self-concept. Investigation of individual adjustments and behavioural management strategies as mediating factors would then address the hypothetical relation established in this doctoral thesis through quantitative means. However, to explore the potentially mediating nature of teacher responses to student behaviours with the self-concept there would be a need to quantify teacher responses. This could, for example, be done by quantifying the number of strategies a child may receive in a lesson or the school with academic self-concept and general self-esteem remaining as outcome variables and ADHD behaviours, social and communication traits of Autism and attachment characteristics remaining a predictor variable.

Following the empirical establishment of the unintentional and potentially negative effects of teacher adjustments to student behaviours in the self-concept, future research could aim to explore in greater detail the barriers and difficulties faced by teachers in implementing more neurodiverse based methods of supporting student behaviour as opposed to typical SEND based interventions. Teachers often spoke in this doctoral thesis of themes around time, support and resources. This could be further unpacked to determine what is propagating the status quo of a teacher/student support system that is deficit-based and potentially harmful to a students' self-concept.

Furthermore, following the absence of the student voice in the qualitative phase of the interview, it would be of interest to conduct interviews or focus groups on pupils' experiences of teacher feedback and in-class adjustments. This would determine how these are interpreted by pupils and the effect it has on them. This could be explored further through interviews with parents on their observations of the impact education has on their children. Further exploration could explore the parents' interpretation of teacher feedback to their child and how this influenced their self-concept behaviour. Parents could even be encouraged to reflect on their own feedback to their child following academic successes or failures and the impact that this may have had on the child's behaviour and self-concept. Indeed, research by Marsh and Shavelson (1985) and Marsh (1990a) has suggested that parental feedback is one of the main sources of information for the construction of the self-concept and therefore may be pivotal in academic behaviour and the academic self-concept.

Finally, future research could also seek to explore whether more neurodiverse intervention strategies and adjustments lead to more positive outcomes for all students in a class rather than the typical SEND based model. This could be explored through qualitative or quantitative means utilising interviews with students around their own experience in school or perhaps measuring the self-concept of students in a classroom utilising more neurodiverse strategies compared to a classroom operating from a SEND-based paradigm. This could also be explored could be through the implementation of a UDL-based intervention in classrooms and an ethnographic exploration of the interpretation and effect of this through observations and teacher and student interviews.

10.4 Summary

To conclude, this research has demonstrated that ADHD behaviours, social and communication difficulties of Autism and attachment characteristics are positively correlated with each other, and therefore likely to co-occur. In addition, ADHD behaviours, social and communication difficulties of Autism and attachment characteristics are negatively correlated with and significant negative predictive of the academic self-concept and general self-esteem. However, there was no evidence of an interaction between these predictors in relation to the academic self-concept and general self-esteem, although there was evidence of a summative effect in some models tested. Furthermore, this thesis has also demonstrated that the themes identified in the teacher interviews such as individual adjustments and behavioural management strategies could indicate underlying mechanisms involved in the relations found between Autistic traits, attachment characteristics, ADHD behaviours and the academic selfconcept and general self-esteem. Therefore, there is a need to recognise in educational practice that ADHD behaviours, Autistic traits and attachment characteristics often appear on a continuum with less severe manifestations still having implications for the self-concept. Managing behaviour using a neurodiverse model may facilitative better outcomes by focusing on young people's strengths.

Chapter 11 - Reflexivity and Reflection

This PhD project was initially associated with the ADHD Foundation, Liverpool. The ADHD Foundation is a charity focused on the support of individuals with neurodevelopmental disorders. The original intention was that the research would focus on the work of the charity. However, the project evolved away from the intervention focus of the Foundation's work to explore a more general picture of ADHD in mainstream education. Despite this, the ADHD Foundation had left a lasting legacy on the PhD. This can primarily be seen in the consistent neurodiverse references and dimensional approaches. Their input and perspective to ADHD and other neurodevelopmental phenomena primed and changed my way of thinking from a primarily clinical paradigm resulting from my MSc placement in clinical psychology. This paradigm change greatly benefitted me, as it moved me onto a pathway of understanding that was just beginning to become represented in the media and practice but was not yet fully developed.

From this starting point of the ADHD Foundation, this reflexive section will explore my prior assumptions and experience to further illuminate my experience and journey through this PhD.

11.1 Prior Assumptions and Experience

To acknowledge how my experiences and "self" may have influenced this research and my interpretation it is first important to enlighten the reader as to "who I am". I am male and currently aged 26, with this doctoral research dominating my early twenties (from 21 to 26). I am from a deprived area of South Yorkshire with both parents leaving school at the youngest possible age as they were unableto see the value or need for further education. The secondary school I attended was in special measures and "required improvement" throughout my time there. The fact that many of the sixth-form colleges which supplied students for the LI-SEM project and teachers that took part in the interviews were all in deprived areas was not lost on me and further fuelled my interest in the project. Indeed, I felt a kinship with the teachers (and indeed their students) as they spoke of classrooms without resources and students struggling to see the value of education or what education can do for them.

My experiences of education were of overwhelmed, seemingly disinterested and possibly burnt-out teachers. This to some extent coloured the starting point of my stance in this research. I was expecting to expose a narrative of teachers punishing students with atypical behaviours in the classroom because it interfered with their ability to do their role. To some extent, I had a very functionalist, mechanical idea of teachers focusing on maximising educational output with little care for students who struggled to learn in the classroom model. As my research journey progressed and I became more informed of theory and practice, my perspective gradually changed – it changed completely following interviews with the teachers. The teacher interviews conducted in the last phase of this doctoral research presented a caring, effortful element to teachers I had struggled to see before. While this does not invalidate my early experience of education, it encouraged me to reflect and consider how the teachers I grew up with may have become how they were. The teachers I interviewed were of driven to support students, follow the guidelines stipulated by the government and genuinely attempt to do the best they could with the resources they had. It is important to stress that this is a vastly different story than my initial perception and should be considered by readers as a tale of caution about the extent to which our own experiences can bias our interpretation. As an aspiring Psychologist, I did consider myself to be acutely aware of my biases and able to work to control and manage them. However, I was incorrect in this case and underestimated the extent to which my earlier educational experiences coloured my interpretation of education.

Upon further reflection, however, I wonder whether the teachers I interviewed were not so different from the teachers I experienced and witnessed growing up. Perhaps I spoke to them earlier in their career before they were burnt out. I hope not, but nonetheless, because of this research, my stance towards teachers and their pupils has become more compassionate, seeing both as potential "victims" of an over-stretched education system that is designed to be the best it can be within its structural limitations.

Aside from my own predisposing experiences that influenced my approach to this PhD, I was faced with personal trauma. My mother was diagnosed with terminal cancer at the beginning of my studies and sadly passed away at the beginning of my second year of study in 2017. This formed a backdrop to the entire PhD that ran concurrently, often interacting and always influencing the PhD. Indeed, at the earlier stages of the PhD when my mother was deteriorating there was an unknown amount of time she had left, I made some dubious decisions. I constantly sought the apparently easiest choices in terms of research methodology. This was in a vain attempt to make sure that the PhD was completed before my mother died and often resulted with outcomes that were less than desirable and therefore meant I had to go back and repeat a phase of the research. Ultimately this unintentionally prolonged periods of the PhD despite my intention being to speed elements up due to my awareness of my limited psychological resources at the time. Indeed, one such period of delay and difficulty was during the introduction of the Government Data Protection Regulation (GDPR) to the Data Protection Act (The United Kingdom Government, 2018) which I perceived to be detrimental to my PhD. I experienced significant difficulty in recruiting participants and schools immediately following the introduction of GDPR and this persisted for some time. This was probably the lowest point of my PhD, still recovering and grieving following the loss of my Mother and feeling like I was making no progress in what felt like an impossible task. More than a few times I considered throwing in the towel and quitting. However, sheer determination and stubbornness forced me to carry on. As this PhD project progressed, it became not just a story of professional growth and development, but

one of grief and recovery. At times my PhD alternated between crutch and a dagger in my side. Regardless of the difficulty in circumstances, hindsight has proven that persisting was the right and best thing to do for me.

11.2 Awareness of Social Setting and the Social "Distance" between the Researcher and Participants

This took a somewhat ironic literal (and metaphorical) meaning during this PhD. The qualitative phase of the thesis took place during the COVID-19 global pandemic. This meant that there needed to be rapid changes to this phase of the PhD. What was initially planned as face-to-face interviews now had to be done in a socially distanced capacity at the very least. Although this was stressful, it proved less stressful than earlier in the PhD when I found it almost impossible to gain access to participants. I instinctly felt that instant messaging technology was the solution to my problems. However, I faced the the anxiety and resistance of my supervisors when I explained this. However, I was confident that this would work in my favour with teachers who were highly intelligent and technologically literate due to the nature of their role. I felt great satisfaction and relief when this gamble and decision paid off.

Aside from the literal distance between the researcher and participants, there were some subjective differences. Testing students and interviewing teachers in working-class areas of Manchester, Sheffield, Liverpool, and Doncaster evoked unique feelings within me. It was a dichotomy of similarity but difference. Coming from a working-class area of Doncaster with a school in special measures, it was interesting to see so much overlap between myself at school and the sixth-form students, and between myself as an adult academic and their teachers. Reflecting on my time as a sixth-form student, I remember the pressure and stress of preparing myself for exams and university, although, I am not sure it was ever as pressured as current sixth-form and exams. However, achievement in A-Levels and GCSEs on average is increasing year by year (Statista, 2020) with more and more students attending university. As such, this presents a starkly more competitive climate than my time in school.

11.3 Awareness of the Wider Cultural and Social Context

The qualitative phase of this doctoral thesis took place during the COVID-19 pandemic and as such presented an uncertain and deeply troubling time for just about everyone, myself included. However, I managed to see the very apparent silver lining Staying at home meant that there were very few avenues for distraction from my PhD. Indeed, although I was battling anxiety around keeping my grandparents safe (as I lived with them at the time) I also relished the inability to be distracted. After about a month this became almost madness-inducing with the constant reminder of the PhD staring at me.

Despite the grave implications of COVID-19, I believe that it personally benefitted my PhD.

11.4 Summary

To summarise, the five years over which this doctoral research was conducted was a journey of personal and professional growth beyond all others with one publication, one in review and one in preparation (see Appendix XI) all thrown into the mix! PhDs are incredibly difficult and demanding journeys in the best of circumstances, add bereavements and a pandemic to the mix and you have a situation like no other. Despite the trials and tribulations of this PhD. I can reflect on the journey as one of lessons learned and resilience gained. I fundamentally feel I have exited the journey a much better person than I started. It is on this note, that I feel this reflection must (and should) end with my thanks again to my team of doctoral supervisors, for their continuous support and understanding. I could not have had a better team supporting me and I could not have done it without them.

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Appendix I

Ethical Approval for Research Ascertaining the Construct Validity of the AAQ

Dear Kalum

With reference to your application for Ethical Approval:

17/ELS/013 – Kalum Bodfield, Establishing the Construct Validity of the Adolescent Attachment Questionnaire (Philip Carey)

The University Research Ethics Committee (UREC) considered the above application. I am pleased to inform you that ethical approval has been granted and the study can now commence.

Approval is given on the understanding that:

- any adverse reactions/events which take place during the course of the project are reported to the Committee immediately;
- any unforeseen ethical issues arising during the course of the project will be reported to the Committee immediately;
- the LJMU logo is used for all documentation relating to participant recruitment and participation e.g. poster, information sheets, consent forms, questionnaires. The LJMU logo can be accessed at <u>http://www.ljmu.ac.uk/corporatecommunications/60486.htm</u>

Where any substantive amendments are proposed to the protocol or study procedures further ethical approval must be sought.

Applicants should note that where relevant appropriate gatekeeper / management permission must be obtained prior to the study commencing at the study site concerned.

For details on how to report adverse events or request ethical approval of major amendments please refer to the information provided at http://www.ljmu.ac.uk/RGSO/93205.htm

Please note that ethical approval is given for a period of five years from the date granted and therefore the expiry date for this project will be June 2022. An application for extension of approval must be submitted if the project continues after this date.



Mandy Williams, Research Support Officer (Research Ethics and Governance) Research and Innovation Services Kingsway House, Hatton Garden, Liverpool L3 2AJ t: 01519046467 e: a.f.williams@ljmu.ac.uk

Appendix II

Ethical Approval for Research Ascertaining the Construct Validity of the ASRS

Dear Kalum

With reference to your application for Ethical Approval

REF: 18/EDN/013 - Kalum Bodfield, (PGR) EDN - Reconstructing the Adult ADHD Self-Report Scale (ASRS) as a Self-Report Adolescent Measure (Philip Carey/Dave Putwain)

UREC decision: Approved with provisos

The University Research Ethics Committee (UREC) has considered the above application by proportionate review. I am pleased to inform you that ethical approval has been granted subject to the provisos listed below. Once the final version of the ethics application with the provisos addressed has been emailed to <u>ethicsPR@ljmu.ac.uk</u>, the study can commence.

Approval is given on the understanding that:

- any adverse reactions/events which take place during the course of the project are reported to the Committee immediately by emailing <u>researchethics@ljmu.ac.uk;</u>
- any unforeseen ethical issues arising during the course of the project will be reported to the Committee immediately emailing <u>researchethics@ljmu.ac.uk;;</u>
- the LJMU logo is used for all documentation relating to participant recruitment and participation eg poster, information sheets, consent forms, questionnaires. The LJMU logo can be accessed at <u>http://www2.ljmu.ac.uk/corporatecommunications/60486.htm</u>

Where any substantive amendments are proposed to the protocol or study procedures further ethical approval must be sought (<u>https://www2.ljmu.ac.uk/RGSO/93205.htm</u>)

Applicants should note that where relevant appropriate gatekeeper / management permission must be obtained prior to the study commencing at the study site concerned.

Please note that ethical approval is given for a period of five years from the date granted and therefore the expiry date for this project will be **24th May 2023**. An application for extension of approval must be submitted if the project continues after this date.

Yours sincerely

Charlotte Mclean



Charlotte Mclean, BA (Hons), MSc

PR REC Manager

(Research Ethics and Governance) Research and Innovation Services Exchange Station, Tithebarn Street, L2 2QP

Appendix III

Ethical Approval for Research Testing the Relations between Developmental Traits and Academic Achievement in Adolescents

Dear Kalum

With reference to your application for Ethical Approval

Kalum Bodfield, PGR - The Relations between Developmental Traits and Academic Achievement in Adolescents (Philip Carey)

UREC reference: 19/EDC/005

The University Research Ethics Committee (UREC) has considered the above application. I am pleased to inform you that ethical approval has been granted subject to the provisos listed below. Once the final version of the ethics application with the provisos addressed has been emailed to researchethics@ljmu.ac.uk, the study can commence.

(Please note, UREC will not check that the provisos have been applied in the final version of the ethics application and will not email any further approval notifications to the applicant once the final version of the ethics application has been forwarded to UREC. If the applicant does not want to apply the provisos as stated below, the applicant must notify UREC and resubmit the ethics application for further review)

Approval is given on the understanding that:

- any adverse reactions/events which take place during the course of the project are reported to the Committee immediately by emailing <u>researchethics@ljmu.ac.uk;</u>
- any unforeseen ethical issues arising during the course of the project will be reported to the Committee immediately emailing <u>researchethics@ljmu.ac.uk;</u>
- the LJMU logo is used for all documentation relating to participant recruitment and participation e.g. poster, information sheets, consent forms, questionnaires. The LJMU logo can be accessed at <u>http://www2.ljmu.ac.uk/corporatecommunications/60486.htm;</u>
- The study consent forms, data, information etc. will be accessible on request to a student's supervisory team and/or to responsible members of Liverpool John Moores University for monitoring, auditing and data authenticity purposes.

Where any substantive amendments are proposed to the protocol or study procedures further ethical approval must be sought (<u>https://www2.ljmu.ac.uk/RGSO/93205.htm</u>)

Applicants should note that where relevant appropriate gatekeeper / management permission must be obtained prior to the study commencing at the study site concerned.

Please note that ethical approval is given for a period of five years from the date granted (13/06/19) and therefore the expiry date for this project will be 5 years from the approval date. An application for extension of approval must be submitted if the project continues after this date.

Yours sincerely



Mandy Williams, Research Support Officer

(Research Ethics and Governance) Research and Innovation Services Exchange Station, Tithebarn Street, L2 2QP t: 01519046467 e: <u>a.f.williams@ljmu.ac.uk</u>

Appendix IV

Ethical Approval for Research Exploring Teachers Perception and Management of Student Behaviours in the Classroom

Dear Kalum

Thank you for registering your study as minimal risk.

PI: Kalum Bodfield

Supervisor (if applicable): Philip Carey

Title of study: An Exploration of Teachers Perception of Student Behaviours in the Classroom

Minimal risk UREC approval reference number: 20/EDC

Approval is given on the understanding that:

- The study is conducted in accordance with the Minimal Ethical Risk Guiding Principles
- Any adverse reactions/events which take place during the course of the project are reported to the Committee immediately by emailing <u>researchethics@ljmu.ac.uk</u>;
- Any unforeseen ethical issues arising during the course of the project will be reported to the Committee immediately emailing <u>researchethics@ljmu.ac.uk</u>;
- The LJMU logo is used for all documentation relating to participant recruitment and participation e.g. poster, information sheets, consent forms, questionnaires. The study consent forms, data, information etc. will be accessible on request to a student's supervisory team and/or to responsible members of Liverpool John Moores University for monitoring, auditing and data authenticity purposes.
- Where any <u>substantive amendments</u> are proposed to the protocol or study procedures that change the associated risk from minimal to low risk (use the decision tool to establish the associated risk), the investigators must complete an ethics application form describing all aspects of the study and submit for ethical review and approval as required.
- Where relevant appropriate gatekeeper / management permission must be obtained prior to the study commencing at the study site concerned.

Please note that approval is given for a period of five years from the date granted and therefore the expiry date for this project will be 5 years from 18/06/20. An application for extension of approval must be submitted if the project continues after this date.

Best wishes

UREC

Appendix V

The Adolescent Attachment Questionnaire as Delivered to Students in the Construct Validation

Adolescent Attachment Questionnaire.

Presented are twelve statements. Please read each statement carefully and select the answer that you most relate to.

	Disagree (0)	Somewhat Disagree (1)	Neither Agree or Disagree (2)	Somewhat Agree (4)	Agree (5)
 I get annoyed at my parent/guardian because it seems I have to demand his/her caring and support. 					
2) My parent/guardian only seems to notice me when I am angry.					
 I enjoy helping my parent/guardian whenever I can. 					
4) I talk things over with my parent/guardian.					
5) I get upset when my parent/guardian doesn't give me the support I need.					
6) It makes me feel good to be able to do things for					

my parent/guardian.

7) I	'm confident
t	hat my
p	parent/guardian
V	vill listen to me.
8) N	Му
p	parent/guardian
a	ilways makes
S	ure my needs
a	re met.
9) I	often feel
a	ingry with my
p	parent/guardian
v	vithout
k	knowing why.
10) I	feel for my
p	parent/guardian
v	vhen he/she is
u	ipset.
11) I	think about my
p	parent/guardian
v	vhen I'm apart
f	rom them.
12) I	'm confident
t	hat my
p	parent/guardian
V	vill try to
u	inderstand my
f	eelings.

(Scoring is done on a likert scale 0-4)

All items except 1, 2, 5 and 9 should be reverse scored.

Angry Distress = 1, 2, 5, 9 Goal-Corrected Partnership = 3, 6, 10, 11 Availability = 4, 7, 8, 12

Appendix VI

The AQ-10 as Delivered to Students in the Construct Validation

Adolescent Autism Spectrum Quotient – Self-Report

	Definitely Agree	Slightly Agree	Neither Agree or Disagree	Slightly Disagree	Disagree	
I usually notice						
patterns in things						
I tend to focus on the						
whole picture rather						
than small details						
I can easily keep track						
of several different						
conversations when						
I'm in a group of						
people						
If I am interrupted in						
what I am doing, I can						
go back to it very						
quickly						
l'orten struggie to						
going						
Lam mostly good at						
small talk in social						
situations						
When I was younger.						
Lused to enjoy						
plaving games with						
other children that						
involved pretending						
and make believe.						
I find it difficult to						
imagine what it						
would be like to be						
someone else						
I generally find social						
situations easy						
I normally find it hard						
to make new friends						

SCORING: Only 1 point can be scored for each question. Score 1 point for Definitely or Slightly Agree on each of items 1, 5, 8 and 10. Score 1 point for Definitely or Slightly Disagree on each of items 2, 3, 4, 6, 7 and 9. If the individual scores more than 6 out of 10, consider referring them for a specialist diagnostic assessment.

Appendix VII

The ASRS as Delivered to Students in the Construct Validation

Adolescent ADHD Self-Report Scale Symptom Checklist

Name:	Today's [Date			
Please answer the questions below, rating yourself on each of the criteria shown using the scale on the right side of the page. As you answer each question, place an X in the box that best describes how you have felt and conducted yourself over the past 6 months.	Never	Rarely	Sometimes	Often	Very Often
How often do you have trouble finishing school work once all the most challenging parts are done?					
How often do you have difficulty organising things when doing school work?					
How often do you have problems remembering to do things?					
When you have difficult school work to do, how often do you avoid/delay starting?					
How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?					
How often do you feel overly active and compelled to do things, like you were driven by a motor?					

Appendix VIII

Interview Schedule for Cognitive Interviewing during Questionnaire Construct Validations

Cognitive Interview Questions

- 1) Please read this question out loud
 - a. Are there any words in this question you are unsure about?
 - b. Can you define the words for me?
- 2) What is this question trying to find out from you?
 - a. Can you tell me why you think that?
- 3) Which answer would you choose as the right answer for you?
- 4) Can you explain to me why you chose that answer?
 - a. Can you describe why you think that's the most appropriate answer for you?

Appendix IX

Complete Questionnaire used in the LI-SEM Study



Thank you for helping with this research. There are 4 sides to this questionnaire, and it should not take you very long to complete.

First of all, can you answer a few questions about yourself.

What are you studying? _____

How old are you? _____

What is your year group? (please tick)

What is your gender?

Year 12	
Year 13	

Male	
Female	
Other	
Prefer not to say	

How would you describe yourself?

(for dual heritage please tick two boxes)

Asian	
Black	
White	
Chinese	
Other	

Please answer the questions below, rating yourself on each of the criteria using the scale on the right. Place an X in the box that best describes you over the past 6 months.	Never	Rarely	Sometimes	Often	Very Often
How often do you have trouble finishing school work once all the most challenging parts are done?					
How often do you have difficulty organising things when doing school work?					
How often do you have problems remembering to do things?					
When you have difficult school work to do, how often do you avoid/delay starting?					
How often do you fidget or squirm with your hands or feet when you have to sit down for a long time?					
How often do you feel overly active and compelled to do things, like you were driven by a motor?					

Please read each statement carefully and place an X in the box that you relate to the most.	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
I get annoyed at my parent/guardian because it seems I have to demand his/her caring and support.					
My parent/guardian only seems to notice me when I am angry.					
I enjoy helping my parent/guardian whenever I can.					
I talk things over with my parent/guardian.					
I get upset when my parent/guardian doesn't give me the support I need.					
It makes me feel good to be able to do things for my parent/guardian.					
I'm confident that my parent/guardian will listen to me.					
My parent/guardian always makes sure my needs are met.					
I often feel angry with my parent/guardian without knowing why.					
I feel for my parent/guardian when he/she is upset.					
I think about my parent/guardian when I'm apart from them.					
I'm confident that my parent/guardian will try to understand my feelings.					
I usually notice patterns in things.					
I tend to focus on the whole picture rather than small details.					
I can easily keep track of several different conversations when I'm in a group of people.					
If I am interrupted in what I am doing, I can go back to it very quickly.					
I often struggle to keep a conversation going.					
I am mostly good at small talk in social situations.					
When I was younger, I used to enjoy playing games with other children that involved pretending and make believe.					
I find it difficult to imagine what it would be like to be someone else.					
I generally find social situations easy.					
I normally find it hard to make new friends.					

This is a chance for you to consider how you think and feel about yourself. This is not a test – there are no right or wrong answers, and everyone will have different responses. The purpose of this study is to determine how people describe themselves and what characteristics are most important to how people feel about themselves.

On the following pages are a series of statements that are more or less true (or more or less false) descriptions of you. Please use the following eight-point response scale to indicate how true (or false) each item is as a description of you. Respond to the items as you now feel even if you felt differently at some other time in your life.

	Definitely False	False	Mostly False	More False than True	More True than False	Mostly true	True	Definitely True
I enjoy doing work for								
most academic subjects								
I hate studying for many academic subjects								
I like most academic								
subjects								
I have trouble with most								
academic subjects								
I am good at most								
academic subjects								
I am not particularly								
interested in most								
academic subjects								
I learn quickly in most								
academic subjects								
I hate most academic								
subjects								
I get good marks in most								
academic subjects								
I could never achieve								
academic honours, even								
if I worked better								

Please find final page on reverse.

	Definitely False	False	Mostly False	More False than True	More True than False	Mostly true	True	Definitely True
Overall, I have a lot of respect for myself								
Overall, I lack self- confidence								
Overall. I am pretty accepting of myself								
Overall, I don't have much respect for myself								
Overall, I have a lot of self-confidence								
Overall, I have a very good self-concept								
Overall, nothing that I do is very important								
Overall, I have pretty positive feelings about myself								
Overall, I have a very poor self-concept								
Overall, I have pretty negative feelings about myself								
Overall, I do lots of things that are important								
Overall, I am not very accepting of myself								

Thank you for taking the time to complete this questionnaire. Should you have any further questions, please do not hesitate to contact my director of studies (Dr Carey) or me on the following emails:Lead Researcher: Kalum Bodfield MSc BSc (Hons) MBPsS – <u>k.s.bodfield@2016.ljmu.ac.uk</u>

Director of Studies: Dr Philip Carey SFHEA – <u>P.Carey@ljmu.ac.uk</u>

Appendix X

Teacher Interview Schedule

Semi-Structured Interview Schedule

1) As a teacher what behaviours do you find the most difficult to manage in the classroom?

2) What behaviours do you think are the most conducive to learning?

3) I am going to ask you how you would manage a few specific behaviours in the classroom and the implications of them on classroom learning

- a) Poor communication skills
- b) Poor social interaction skills, for example a child does not pick up on social cues
- c) Hyperactivity
- d) Poor peer relationships
- e) impulsive behaviour
- f) inattention or distraction

4) For classroom-based learning to work well, what do you need from the students in a behavioural sense? What should they do?

5) How do you think a teacher should act in a lesson? What are the best behaviours for teachers to demonstrate to the students?

6) From your own experience, what do you find the most challenging about managing a class of students?

7) What makes a student academically capable? How do they act?

8) In what ways would you say relationships between students and their peers are conducive to learning?

9) How do you think a student's relationship to their teacher impacts their behaviour in a classroom?

10) What impact do you think your teaching has on a student's self-esteem?

11) How do you think teachers influence how students view themselves in school? Their self-concept in school as it would be

Appendix XI

List of Publications

- Bodfield, K. S., Putwain, D. W., Carey, P., & Rowley, A. (2020). A construct validation and extension of the adolescent attachment questionnaire (AAQ). *Journal of Social and Personal Relationships*, 37(12), 3070-3082. https://doi.org/10.1177%2F0265407520951267
- Bodfield, K. S., Putwain, D. W., Carey, P., & Rowley, A. (2022). Attachment Characteristics and ADHD Behaviours as Predictors of Adolescents Academic Self-Concept and General Self-Esteem. *Exceptionality* – Under Review
- Bodfield, K. S., Carey, P., Putwain, D. W., & Rowley, A. (2022). Themes in Teacher Perception and Management of Atypical Student Behaviours, Traits and Characteristics and their Relation to the Student Self-Concept – In Preparation