EXPLORING TALENT IDENTIFICATION AND DEVELOPMENT PATHWAYS IN ENGLISH FEMALE SOCCER ACADEMIES

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Contents

I Abstract

Female soccer in England continues to experience significant growth, marked by rising popularity, increased participation, and strategic structural changes designed to enhance youth talent pathways. Despite this progress, there remains a limited understanding of how female soccer academies approach talent identification, development, and coaching practices. This thesis addresses this gap through three interrelated studies, with each examining different aspects of female youth soccer development. Therefore, the aim of this thesis was to investigate the talent identification and development pathways within female youth soccer academies in England. Utilising a mixed-methods approach, the research involved academy directors, players, and coaches, and combined both quantitative and qualitative analyses through the collection of studies to provide a comprehensive evaluation.

Study One surveyed academy directors to identify current talent identification and development practices across female youth soccer academies affiliated to clubs in the highest three senior league tiers. The 31-question online survey revealed a scarcity of dedicated recruitment departments, with talent identification processes largely limited to observations in trials by coaches and academy directors. While talent development processes became more professionalised and multidisciplinary at higher age categories and league tiers, challenges still remain in optimising these processes and pathways.

Study Two explored the developmental milestones, soccer engagement, and perceptions of 34 youth players from Women's Super League (WSL) academies. Through the Participation History Questionnaire (PHQ), players reported an earlier start age in soccer than professional players (Andrew et al., 2024), shifting from informal, play-based activities during childhood to structured practice in adolescence,

coinciding with entry into an academy system. Enjoyment and motivation remained high throughout development, while perceived physical and cognitive challenge increased as players aged. Findings highlight the importance of contemporary investigations into developmental soccer engagement and milestones.

Study Three employed a case study approach to examine practice activities and coaching behaviours in a single WSL academy. Systematic observations of practice sessions and stimulated recall interviews revealed the predominance of games-based over drill-based activities, aligning with recommendations from skill acquisition theory (Williams & Hodges, 2005). Behaviour observations indicated varied coaching styles, from prescriptive to guided-discovery. This study generates new insights into existing coaching practices and offers practical recommendations for improving player engagement and development.

Together, this collection of studies delivers a comprehensive and contemporary evaluation of female youth soccer development in England, offering valuable benchmarks and recommendations for future initiatives to optimise talent pathways and coaching practices.

II Declaration

No portion of the work referred to in this thesis has been submitted in support of an application for another degree or qualification of this or any other university or institute of learning.

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IV Table Legends

V Figure Legends

VI Abbreviations

Abbreviation	Long Form
ACC	Advanced Coaching Centre
ACL	Anterior Cruciate Ligament
ASUOI	Arizona State University Observation Instrument
CAIS	Coach Analysis and Intervention System
CPD	Continuing Professional Development
CPF	Challenge Point Framework
DMSP	Developmental Model of Sport Participation
EPPP	Elite Player Performance Plan
ETC	Emerging Talent Centre
FCM	Four Corner Model
FIFA	Fédération Internationale de Football Association
IQR	Interquartile Range
PGA	Professional Game Academy
PHQ	Participation History Questionnaire
RAE	Relative Age Effect
RPM	Rate Per Minute
RTC	Regional Talent Club
SD	Standard Deviation
TASS	Talented Athlete Scholarship Scheme
The FA	The Football Association
UEFA	Union of European Football Associations
U.K.	The United Kingdom of Great Britain and Northern Ireland
U.S.	United States of America
WC	Women's Championship
WFA	Women's Football Association
WNL	Women's National League
WPL	Women's Premier League
WSL	Women's Super League

VII Academic and Professional Disseminations

Peer-reviewed Journal Articles

Alder, S. E., Causer, J., Champ, F. M., McRobert, A. P., Datson, N., & Andrew, M. (2024). Talent identification and development processes of female soccer academies from the top three tiers in England. *Journal of Expertise, 7*(4), 130-148.

Alder, S. E., McRobert, A. P., Champ, F. M., Causer, J., Andrew, M. (2025) *Practice activities and behaviours employed by youth soccer coaches within a professional female soccer academy in England*. [Manuscript submitted for publication].

Andrew, M., Ford, P. R., **Alder, S. E.**, Champ, F. M., Brownlee, T. E., Datson, N., & Causer, J. (2024). Talent development in female soccer: Developmental activities of professional players in England. *Journal of Sports Sciences*, *42*(10), 853-864.

Conference Proceedings

Alder, S. E. (2023, May) *The macro- and micro-structure of practice of youth elite female soccer players in England.* Symposium presentation to the 10th meeting of Expertise and Skill Acquisition Network (ESAN), Manchester.

1 Introduction to talent identification and development pathways in female soccer

1.1 Prologue

The primary aim of this thesis is to explore the current talent identification and development pathways and processes within English female youth soccer. This introductory chapter precedes three investigative chapters, each of which will address distinct aspects of the research. The concluding epilogue chapter will synthesise the findings from these investigations and discuss the broader theoretical and practical implications of the research. The following introductory chapter begins by providing a contextual overview of the development of female soccer within England, along with an exploration of key issues relating to talent identification and development within the sport. Subsequent sections will review the existing literature on talent identification and development specific to female soccer and establish the rationale for this research programme. The chapter will conclude by outlining the aims of each empirical study and a discussion of the methodological approach used within each chapter and across the thesis as a whole. Throughout this thesis, the term 'soccer' has consistently been used to describe 'association football', to clearly distinguish from other similarly named sports, such as American, Gaelic, or Australian Football.

1.2 Development of female soccer within England

Female soccer continues to experience exponential growth on a global scale. Between 2019 and 2023, the number of female players participating in organised soccer surged by 24%, reaching 16.6 million globally (Fédération Internationale de Football Association (FIFA), 2023). In this same period, certain Member Associations, including Brazil, Mexico, and England, have seen particularly significant increases in

female participation, with England observing a growth rate of 2,720% (FIFA, 2023). Within England, soccer remains the top participation sport for women and girls, and is currently experiencing a remarkable period of growth at all levels. For example, the Women's Super League (WSL), the highest senior league tier, has accommodated substantial increases in average live attendance (3,092 to 7,457) and peak television audience (270,000 to 1.1 million) in just three years (2020-2023; The Football Association (The FA), 2023a). Additionally, the WSL has amassed the largest social media following of any female professional league globally, with 2.5 million followers.

On an international level, the recent success of the English senior national team, colloquially known as the Lionesses, has arguably expedited such growth in popularity and participation. The Lionesses won their first major tournament at the UEFA (Union of European Football Associations) European Championships in 2022, in front of a home crowd of over 87,000 fans and a peak television audience of 17.4 million. This momentum continued into 2023, with victory in the Women's Finalissima and a runner-up finish at the FIFA Women's World Cup. As a result, the senior national team is ranked second in the FIFA Women's World Ranking (as of August 2024), their highest since records began. England's youth international teams have also excelled in major competitions. For example, the Under-17 team reached the semi-final in 2023 and finished runners-up in 2024 during the UEFA Women's U-17 Championships, while the Under-19 squad reached the semi-final (2024) in the UEFA Women's U-19 Championship. These recent performances at both youth and senior levels have showcased the depth of talent and continued progress of English female soccer on the international stage.

This success could also be underpinned, in part, by the series of female-soccer-specific strategies implemented by the governing body within England (The FA) over the last decade. Following on from the *Game Changer* strategy for developing women's soccer, The FA launched a formal strategy for women's and girls' soccer, entitled *The Gameplan for Growth* (The FA, 2017). This three-year plan aimed to transform the landscape of female soccer by focusing on three key objectives: (1) doubling participation by improving access to the game at grassroots level, in schools, and by supporting initiatives that promote early participation for girls; (2) doubling the fanbase through enhanced marketing, media coverage and improved matchday experiences; and (3) ensuring sustainable success on the international stage by enhancing the elite player pathway experience through investment in coaching, facilities, and resources such as sports science. By 2020, the strategy had achieved its aims, doubling participation, significantly increasing the visibility and popularity of the game, and establishing a strong foundation for further growth. For example, in fulfilling the target to double participation, the number of affiliated teams grew from 6,000 to 12,500 (The FA, 2020a).

Building on this success, *Inspiring Positive Change* was introduced in 2020 as the next four-year strategy for the continued development of women's and girls' soccer (The FA, 2020b). This strategy aspired to: (1) create a sustainable future through continued investment and commercial partnerships; (2) build the best professional women's leagues globally by investing in facilities and player development, and securing broadcast deals; (3) expand grassroots participation by increasing accessibility and strengthening school programmes; (4) develop world-class talent pathways by investing further in coaching, sports science, and player welfare; (5) raise the visibility and profile of women's soccer through increased media coverage,

broadcast deals, and marketing campaigns featuring role models to inspire future generations of players; and (6) promote inclusivity and diversity with targeted programmes to engage underrepresented communities and increase diversity within the soccer workforce. This comprehensive approach has been implemented to ensure that female soccer continues to thrive and inspire future generations within the nation, while creating a lasting, positive impact at all levels of the game.

Collectively, these strategies, coupled with success on the international level, have likely contributed to significant growth in key areas of the sport in recent years. For example, England has experienced increases in female affiliated players (12% increase), registered youth teams (39% increase), registered referees (78% increase), and qualified coaches operating in the female game (83% increase) within England from 2021 to 2023 (The FA, 2023a). However, achieving such progress in England has required sustained effort and commitment through setbacks, such as a 50-year ban that suppressed female soccer for decades.

1.3 History of female soccer within England

In England, female soccer first gained momentum during the First World War (1914-1918), when women occupied traditionally male roles, particularly in factories (see **Figure 1.1**; The FA, 2024a). To boost morale, health, and productivity, women were encouraged to participate in sports, leading to the formation of factory soccer teams. During this period, interest in female soccer grew in terms of participation and spectatorship. However, following the war, many factories closed, and women either retrained in other professions or returned to domestic roles. Simultaneously, concerns were raised regarding the appropriateness and suitability of soccer for women's health,

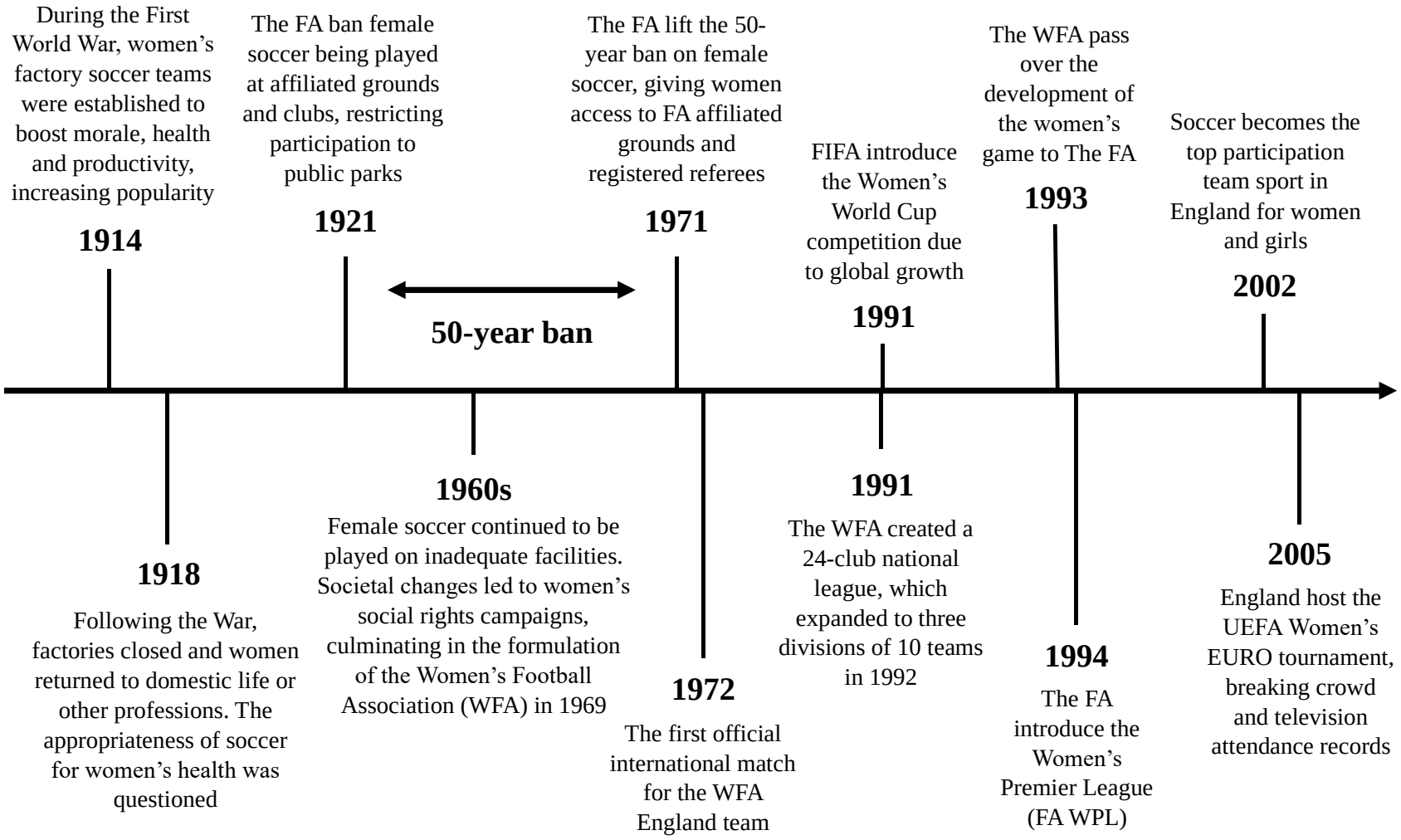

Figure 1.1 Timeline of the history of female soccer within England. Information from The FA (2024a).

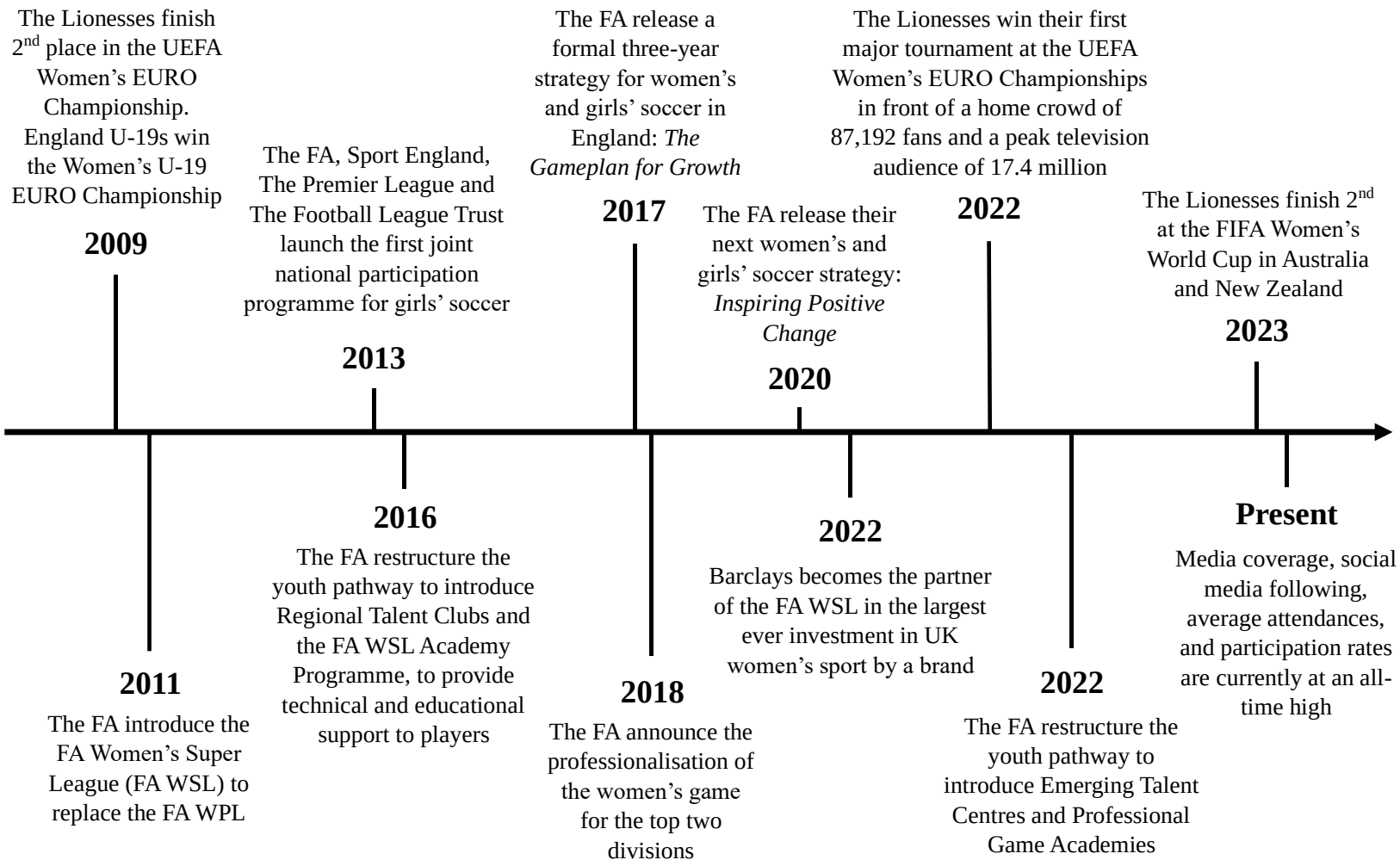

Figure 1.1 Continued.

later prompting The FA to ban female soccer at affiliated grounds and clubs in 1921. The ban lasted for 50 years, though participation continued during this period, albeit restricted to inadequately sized facilities and public parks.

The formation of the Women's Football Association (WFA) in 1969, coupled with growing pressure from women's social rights movements, put increasing pressure on The FA, and the ban was lifted in 1971. League matches and tournaments emerged thereafter, alongside sporadic international games. The WFA continued to oversee the development of the female game until the 1990s, a period that also saw the introduction of official international competitions by UEFA and FIFA, marking a broader global expansion. In 1993, due to limited financial resources to progress the game further, the WFA transferred responsibility for the women's game to The FA.

From 1994, The FA assumed control of the Women's FA Cup and League Cup, and reformed the league into the Women's Premier League (WPL). By 2002, soccer had become the top participation team sport within the nation for women and girls. Popularity increased further when England hosted the UEFA Women's European Championship in 2005, breaking attendance and television audience records within the nation. In 2011, The FA converted the WPL into the WSL, which eventually led to restructuring and professionalisation of the top two league divisions in 2018, a system that remains in place to date. Below these divisions, the female soccer pyramid continued to expand, supported by the implementation of the two aforementioned female-soccer-specific strategies in 2017 (*The Gameplan for Growth*) and 2020 (*Inspiring Positive Change*). As a result, there are now developed and recognised talent pathways into the professional game, and many clubs have introduced Academy structures to oversee player development.

At youth level, the last decade in particular has observed significant growth, restructuring, and reformations. In 2013, The FA, in collaboration with Sport England, The Premier League, and The Football League Trust, launched the first joint national participation programme aimed at increasing grassroots participation. In 2016, The FA replaced the Centre of Excellence model and Player Development Centres with Regional Talent Clubs (RTCs) and Advanced Coaching Centres (ACCs) for players aged 9-16 years, alongside FA WSL Academies for those aged 16-20 years. These changes were implemented to support clubs with the identification and development of talented players through a technical and educational programme. In 2022, The FA introduced another major restructuring to the youth development pathway. Emerging Talent Centres (ETCs) replaced RTCs and ACCs for players aged 8-16 years, to increase the number of players and technical staff on the talent pathway and improve accessibility to high performance training environments for players. Similarly, Professional Game Academies (PGAs) replaced FA WSL Academies for players aged 14-20 years, to provide enhanced preparation for competing at the senior level. Throughout these transitions, The FA have maintained flexibility, allowing all clubs to establish their own philosophies and ambitions within their youth structures, while providing specific guidelines to support the development of players along the talent pathway (England Football, 2023).

1.4 Talent identification and development in soccer

Talent identification and development are critical processes within the youth structures of soccer clubs and organisations (Vaeyens et al., 2008; Williams et al., 2020). In soccer, talent identification refers to the process of recognising players with the

potential to progress into and through high-performance development environments to become elite players (Williams et al., 2020; Williams & Reilly, 2000; see **Figure 1.2**), and has been described as a non-linear, dynamic and complex process (Larkin & O'Connor, 2017; Reeves et al., 2018a), that is typically based on the demonstration of multiple interacting attributes deemed conducive to high-level soccer performance. Players are typically identified through participation, defined as engagement at recreational or grassroots level, or within informal, playful settings (Williams et al., 2020). Alternatively, players may be identified via detection from external sports (not included in **Figure 1.2**), who are considered to display the potential required to progress through soccer development programmes.

Once identified and recruited, players are subject to talent development, the process of providing players with an environment and youth development programme designed to progress players through various age categories towards higher levels of performance, and ultimately senior, professional status (Williams et al., 2020). Within these environments, players' abilities are nurtured and enhanced to provide effective preparation for high performance levels (Güllich, 2014). As players progress, they face periodic evaluations, resulting in either selection or deselection. Selection refers to the ongoing process of choosing players within a development programme that demonstrate the attributes required for progression to a future squad, whereas deselection is the process of removing players from the programme due to insufficient demonstration of the required attributes for progression (Williams et al., 2020).

Deselected players may re-enter the system at the participation, identification, or development phases, or transition out of soccer entirely. As players advance through higher competitive levels and age categories, fewer places within squads become available and competition for selection intensifies, therefore (de)selection becomes

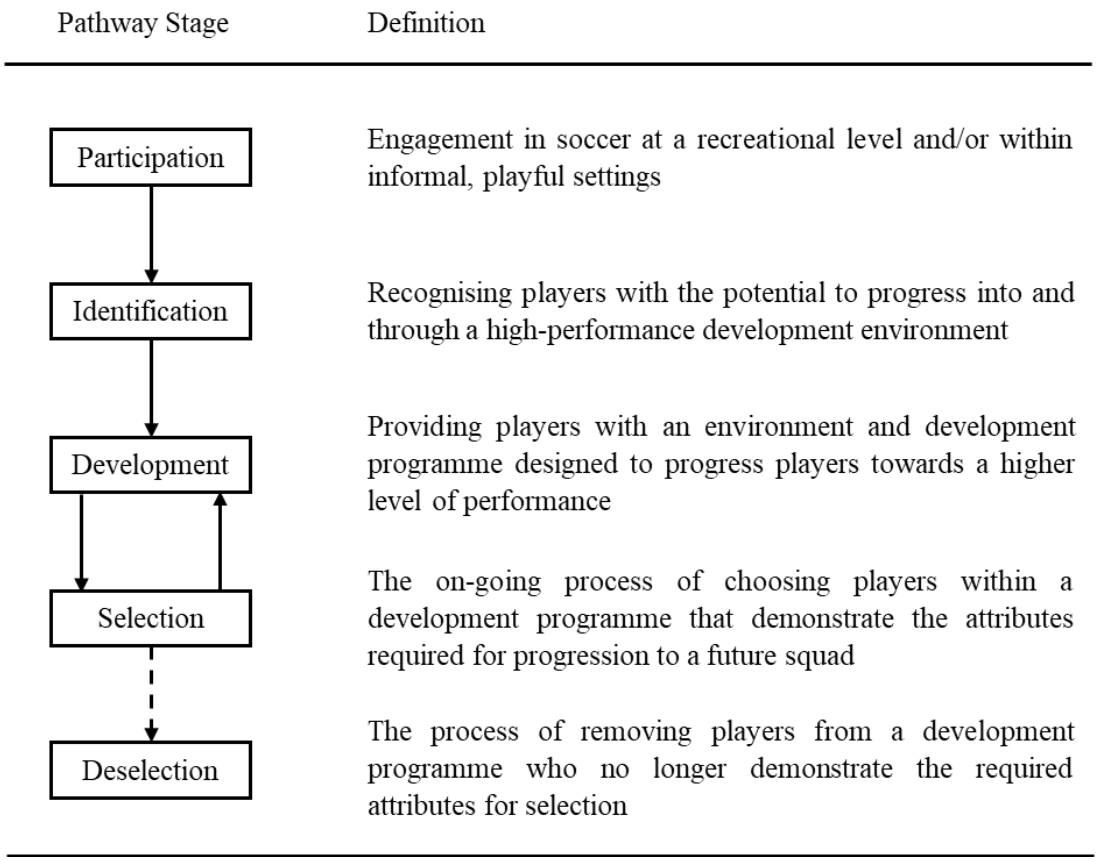

Figure 1.2 Key elements of the talent identification and development process within soccer, with definitions (adapted from Williams et al., 2020). Arrows indicate typical player pathways through this process, and heavy dashed lines represent interlinked concepts. Note: this is not a strictly linear process, with multiple entry and exit points along the pathway.

increasingly more critical (Butt & Molnar, 2009; Dugdale et al., 2023; Neely et al., 2016; Williams et al., 2020).Players can also leave the system at any stage due to dropout (Back et al., 2022; Gredin et al., 2022), of which the annual rate is higher for female (27%) compared to male players (21%; Møllerløkken et al. 2015).

In soccer, talent identification is an integral component of youth structures and academies, driven by the potential for future competitive success (Vaeyens et al., 2008) or financial returns on players (Reilly et al., 2000; Reeves & Roberts, 2019). However, the process remains a complex and dynamic process (Baker et al., 2018; Reeves et al., 2018a). Traditionally, player recruitment methods relied heavily on the subjective

evaluations of scouts and coaches, focusing on attributes they perceived would lead to future expert performance (Christensen, 2009; Unnithan et al., 2012; Williams & Reilly, 2000). Although, when this is the sole approach to identification and recruitment (i.e., mono-disciplinary), inconsistencies in selection decisions and processes can arise (Meylan et al., 2010). To address this, a holistic, evidence-based (i.e., multi-disciplinary) approach has been recommended, marked by the integration of multiple components and predictors of performance to inform selection decisions (Unnithan et al., 2012; Williams et al., 2020). Recent research has indicated evidence of this approach being adopted within practice (Larkin & O'Connor, 2017). This is particularly important, given that performance is influenced by an interplay of multiple complex and interacting attributes. The growing role of sports science in recent decades has expedited the evaluation of long-term performance predictors (Roberts et al., 2019; Unnithan et al., 2012), including physical (e.g., endurance), skill (e.g., technical/tactical), psychological (e.g., motivation), and sociological (e.g., background) factors. These are also mediated by factors such as maturation, chance events, the development environment, and the external environment (Williams et al., 2020).

Certain attributes have received more research attention than others, possibly reflecting trends in practice, or vice versa. For example, a recent review identified that physical attributes were the most frequently studied within the literature (Williams et al., 2020). Equally, physical assessments of players have traditionally been favoured by those responsible for player identification for clubs and academies. This can contribute towards a selection bias towards early maturing players, who may benefit from potential physical and performance advantages such as increased height, weight, speed, or strength (Haugaasen & Jordet, 2012; Hill et al., 2020; Johnson et al., 2017;

Mujika et al., 2009). This can have significant implications for later maturing players, who may face premature deselection and therefore be omitted from further development programmes and opportunities (Delorme et al., 2010; Unnithan et al., 2012; Vaeyens et al., 2008; Williams & Reilly, 2000).

Despite these challenges, several attributes now have predictive value in determining future success, including height, speed, fitness, agility, motivation and hours accumulated in practice during development (e.g. Carling et al., 2012; Deprez et al., 2015; Forsman et al., 2016; Höner et al., 2017; Le Gall et al., 2010; Van Yperen, 2009). Although, the vast majority of these outputs have focused on male samples only (Williams et al., 2020), leaving talent identification and development processes in female soccer comparatively less explored. In England, practical frameworks such as the Elite Player Performance Plan (EPPP; The Premier League, 2011) have been introduced that guide the development of male youth players across all developmental stages (Under-9 to Under-23). The EPPP, initiated by The Premier League in 2011, emphasises increased contact time, enhanced coaching provision, educational support, and a quality assurance and categorisation system for the academies responsible for developing players (Reeves et al., 2018b). Since its inception, over 90 professional clubs have invested in youth development programmes, increasing the number of academy coaches from 250 to over 800 between 2012 and 2022 (The Premier League, 2022). At present, there is no comprehensive equivalent system in place for female players. Regarding coaching, The FA introduced the Four Corner Model (FCM) in the early 2000's to promote a multi-disciplinary approach to talent development (The FA, 2020c). The FCM considers (a) technical/tactical, (b) psychological, (c) physical, and (d) social attributes, as equal and interconnected areas. This model encourages coaches to develop players holistically across these dimensions or 'corners' (Kelly, 2023) and

also shapes the national coach development curriculum to ensure consistency in youth player development, which all coaches in both male and female soccer engage with to attain coaching qualifications.

Alongside these models, youth player development is also influenced by multiple key stakeholders. Governing bodies, such as The FA, oversee the talent pathway from youth to senior level, and establish policies that shape player progression and engagement. For example, The FA's Youth Football Position Statement (The FA, 2020d) summarised their stance and policies on a variety of issues, such as playing up or down age categories. It is recommended that these guidelines are evidence-based and developed collaboratively between researchers, practitioners, and policymakers to optimise player experiences (Turnnidge et al., 2017). Within clubs and academies, coaches are instrumental in shaping player development through practice session design and activities (Ford et al., 2010a), the behaviours and verbalisations they offer during these sessions (Partington & Cushion, 2013), and their involvement in selection and deselection decisions alongside other academy staff (Williams & Reilly, 2000). They can play a key role in facilitating skill acquisition by designing training environments that closely simulate the demands of competition, and considering individual differences in player development, such as adjusting the level of challenge to suit each player's unique needs (Williams & Hodges, 2023). This ability to create tailored, development-focused environments is critical for nurturing the skills and attributes required for long-term success (Musculus & Lobinger, 2018; Dugdale et al., 2023).

Overall, talent identification and development are essential components of youth soccer, shaping the future of players through structured, multi-faceted pathways. Despite the complexity and challenges involved, such as selection biases, gender

disparities, and evolving assessment methods, recent advancements in research and practical frameworks have strengthened these processes. Holistic approaches that integrate technical, physical, psychological, and social factors are key to fostering long-term player progression (Williams et al., 2020; Williams & Reilly, 2000). While male soccer has benefitted from comprehensive models like the EPPP, female soccer ETCs and PGAs operate under guidance from The FA regarding player development and conditions for development. Nevertheless, further refinement is needed to optimise talent pathways across both genders. Ultimately, ongoing collaboration between governing bodies, coaches, and researchers will continue to play a pivotal role in shaping the future of talent development in soccer.

1.5 Gender differences in talent identification and development

The mechanisms through which female players are identified, developed, and supported remain under-explored, particularly in comparison to male soccer academy systems, making this a critical area for further research in the talent identification and development literature (Curran et al., 2019; Emmonds et al., 2019). Key developmental differences between male and female players, as well as the distinct environments in which they operate, suggest that applying male-centric models and research to the female game could be misguided, ineffective, or even harmful (Emmonds et al., 2019; Johnston et al., 2018). Therefore, careful consideration must be given to ensure that the unique needs of female players are addressed.

One significant area where these differences are evident is in growth and maturation, which are widely recognised to impact the biopsychosocial development of girls and boys in distinct ways. While both sexes share similar developmental

patterns during childhood (Faigenbaum et al., 2020; O'Brien-Smith et al., 2020; Radnor et al., 2023), females typically reach maturity and peak motor skill development approximately two years earlier than males on average, suggesting they are more biologically mature than males of the same chronological age (Malina et al., 2004). This earlier maturation in females has important implications for talent identification and development, as it influences factors such as peak height velocity (Stratton & Oliver, 2020) and nutritional requirements (North et al., 2023). However, post-pubescent physical changes can counteract any initial advantages gained by early maturation for female players (Peters et al., 2022), as males tend to experience greater gains in muscle mass and physical performance as they become stronger and faster (O'Brien et al., 2010). Conversely, increases in sex-specific fat-mass for girls can negatively affect motor skill execution involving the movement of body mass (Malina et al., 2004; Radnor et al., 2023). These physiological differences underscore why evidence derived from male soccer cannot simply be applied to female players, particularly once they reach and surpass puberty (Lloyd & Oliver, 2012).

Female players also have unique health considerations, such as menstruation and pregnancy. These topics have been historically underexplored by researchers but are increasingly gaining attention due to their potential impact on athletes' performance, recovery, and injury risk (Randell et al., 2021). For example, fluctuations in hormone concentrations during the menstrual cycle could hypothetically influence performance through energy levels, hydration, and muscle strength. There is still a pressing need for further research on menstruation and the impact of hormonal contraceptives on performance, along with the development of strategies to better support female soccer players (McMahon et al., 2023). Therefore, there are clear issues that affect the development of female athletes in comparison to their male

counterparts, but most of these require further research to understand how they influence development and performance, which can allow for gender-specific policies and practices to be implemented (Cowley et al., 2021; Curran et al., 2019).

Moreover, female players face a heightened risk of certain injuries, such as anterior cruciate ligament (ACL) tears, which are 2-6 times more common in female than male athletes (Datson et al., 2014; Gupta et al., 2020; Pedley et al., 2021). This increased risk emphasises the need for tailored training and injury prevention programmes specifically designed for female players. Relying on male-centric frameworks may overlook these gender-specific needs, therefore more research is required to determine appropriate practice intensity, coaching programmes and strength and conditioning requirements to mitigate these risks and promote long-term success and health for female athletes.

Beyond physical and biological factors, gaps remain in understanding the development environments provided to female soccer players in comparison to their male counterparts. Evidence suggests that male academies are often well-resourced, employing a wide range of specialist practitioners, including coaches, scouts, physiotherapists, nutritionists, and psychologists, who work collaboratively to support player development (Reeves et al., 2023). In contrast, female youth academies and the extent of specialist support they provide remain less documented. Identifying gaps in provision could inform future investment initiatives and enhance the growth of the female game. For example, research by Lyons et al. (2024) found that boys in Australian youth soccer reported more holistic development experiences and higher self-efficacy compared to girls, suggesting that differences in support systems may influence player development experiences across genders.

These issues emphasise the necessity for gender-specific research and tailored approaches to talent identification and development in soccer. An over-reliance on male-based data to design training programmes and developmental models for girls and women risks yielding suboptimal outcomes (Murata et al., 2021). Given the distinct maturational, physiological, and psychological differences between male and female players (Sarmento et al., 2018), female-specific research is vital to inform the design and implementation of appropriate practice programmes and development environments for women and girls (Fraser & Kochanek, 2023; Leyhr et al., 2020). While certain practices may benefit both male and female players, assumptions of their effectiveness and pertinence should be based on robust evidence. Understanding talent development through this gendered lens, as suggested by McMahon et al. (2023), can illuminate the complex and multifaceted nature of athlete development and ensures that gender-specific factors are considered when nurturing expertise. However, to date, there remains a significant knowledge gap in identifying and developing expert performers in the female game, with further research required to address this imbalance.

The pathways through which male and female players are identified and developed, as well as the future career opportunities available to them, also diverge significantly. In male soccer, talent identification often begins at a very young age, with boys typically recruited into academies as early as six or seven years old. They typically undergo early specialisation, engaging in structured practice and competition designed to accelerate their development (Sweeney et al., 2021). However, the long-term effectiveness of early specialisation has been questioned, particularly regarding burnout, injury risks, and the exclusion of late-developing players (e.g., Bell et al., 2018). Despite these concerns, English male academies continue to prioritise early

selection, shaping the elite player pathway in a way that may not align with long-term player development (Kelly et al., 2023). For female players, the talent identification and development landscape has historically been less structured, influenced by fewer professional career opportunities and financial incentives. As a result, developmental pathways for female players have been less clearly defined. Recent structural changes at youth level indicate that the English system is, in part, designed to recruit girls at an early age to develop and produce professional soccer players, also aligning with an early specialisation approach. However, with increased investment in female soccer, there is a growing need to establish structured, evidence-based talent identification and development frameworks that account for the unique challenges and opportunities within the female game. Learning from the successes and limitations of the male academy system could help contribute towards shaping more effective gender-specific frameworks and development models (Bennett et al., 2018; Kelly et al., 2022).

These differences in talent identification and development structures also have implications for the long-term development of male and female players. The established infrastructure in male soccer offers a more predictable pathway to financial security and career longevity. In contrast, female players have historically faced uncertainty, influencing how seriously they commit to soccer from a young age. However, with the rise and growth of professional women's league and increased visibility, the developmental landscape is evolving (Department for Culture, Media and Sport, 2023). Understanding these shifts is crucial for understanding and refining talent identification and development strategies and ensuring female players receive tailored developmental support. This discussion directly ties into the key aims of the thesis, which will later explore the talent pathway and resultant implications on player

development within the female game, providing a foundation for future recommendations in the final chapter.

1.6 Overview of talent identification and development literature in female soccer

Given the developmentally different experiences of male and female players, it is important to understand and critically evaluate existing research on talent identification and development in female soccer. While female-specific literature remains limited across various soccer domains, there has been an encouraging increase in research, particularly in the last decade. A recent scoping review noted an exponential rise in the number of research studies within the female game, with annual publications growing from 55 to 202 between 2009 and 2019 (Okholm Kryger et al., 2021). However, despite this growth, research remains unevenly distributed, with the majority focusing on sports medicine and strength and conditioning, leaving significant gaps in knowledge regarding developmental pathways. Moreover, only 26% of female soccer studies involved youth players (Okholm Kryger et al., 2021), further restricting insights into the early stages of talent development. Such an imbalance raises concerns about the comprehensiveness of current research and its applicability to holistic talent development. As female soccer continues to increase in popularity and professionalism, talent identification and development research is expanding, but currently remains underrepresented in comparison to the male game (Baker et al., 2020; Curran et al., 2019). A critical review of talent development literature revealed that female samples and experiences were persistently underrepresented across all domains, including talent development, talent identification, maturation, sport specialisation, physical development, and

psychological development, highlighting a gender data gap (Curran et al., 2019). A review on talent research by Baker et al. (2020) supports this idea, with areas such as developmental pathways and training/practice particularly under-researched. Without addressing these gaps, our understanding of the unique challenges and developmental pathways for female players will remain incomplete, limiting the potential for evidence-based improvements in recruitment and development processes (Curran et al., 2019; Emmonds et al., 2023; Kelly et al., 2023). However, the growing talent identification and development literature does cover several critical themes within the context of female soccer, albeit largely limited to physical, physiological and motor predictors of success, as well as psycho-social influences. Examples of such predictors are displayed in **Figure 1.3**.

1.6.1 Physical predictors

Physical characteristics have been explored to a greater extent within the female soccer literature in comparison to other attributes. Research has indicated that a variety of physical attributes may be reliable predictors of later selection and attainment of professional contracts and status (Radnor et al., 2023; Randell et al., 2021). For example, in testing a range of anthropometric and physical characteristics of 228 female youth soccer players from England, Datson et al. (2020) identified high-intensity endurance capacity as a factor predicting future career progression into youth international squads. Similarly, Leyhr et al. (2020) conducted a longitudinal investigation of physical and skill characteristics with 737 German youth players from the U-12 to U-15 age categories. Physical attributes relating to fitness, such as sprint speed and agility, appeared to discriminate between players registered within professional and non-professional clubs. However, these studies often fail to account

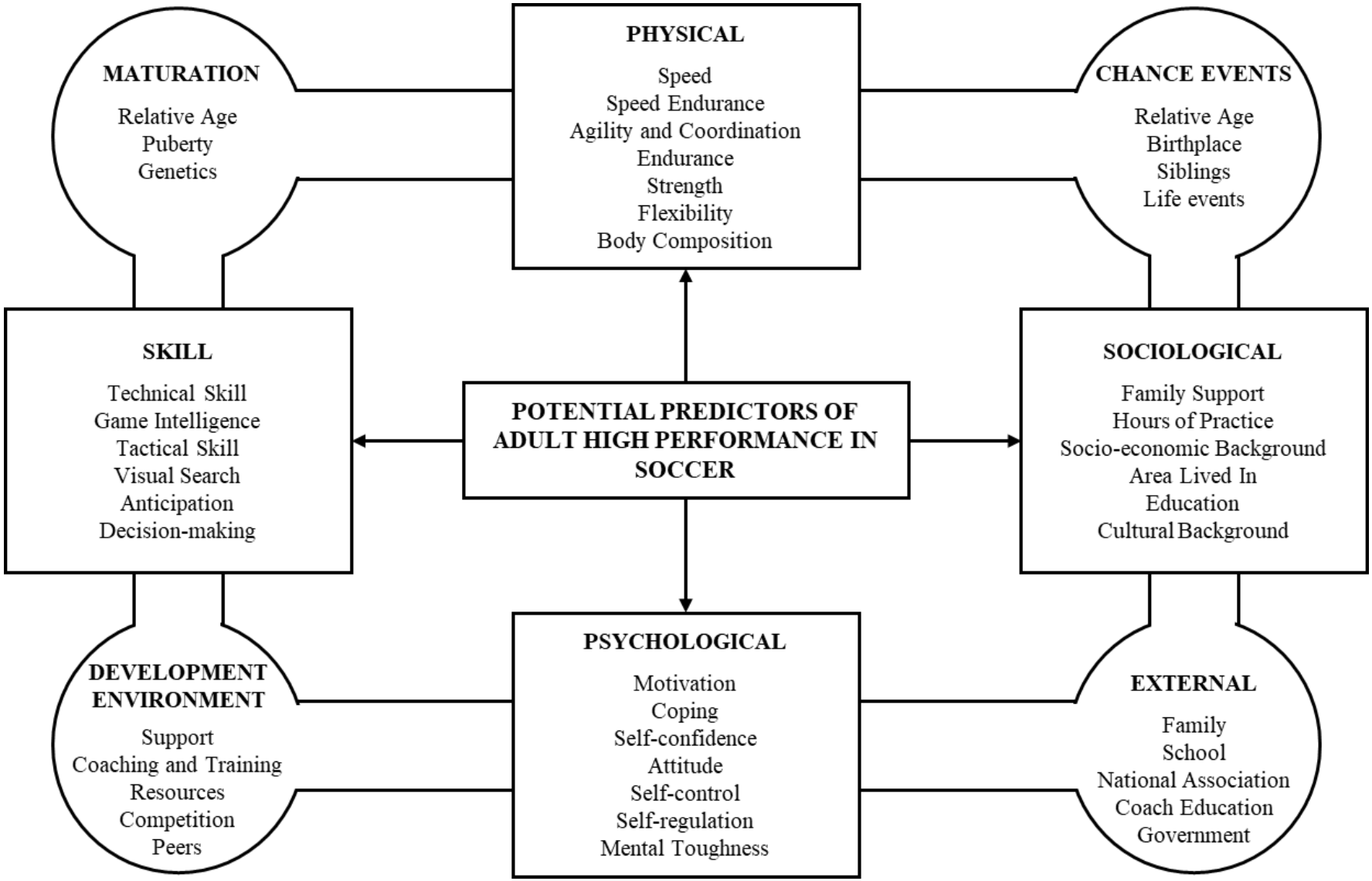

Figure 1.3 Potential predictors of adult high performance in soccer, with mediating factors (adapted from Williams et al., 2020).

for contextual factors such as practice history and individual variability, which may confound findings. Additionally, research on physical match characteristics has highlighted differences between positions and age groups in female youth players, which have important implications for the creation of appropriate development programmes, practice designs, and strength and conditioning requirements (Datson et al., 2017; Emmonds et al., 2018; Harkness-Armstrong et al., 2021). For example, Harkness-Armstrong et al. (2021) revealed age and position-specific differences during match play between U-14 and U-16 female youth players from England, with older players covering greater distances and reaching higher running speeds. Such findings may inform coaching programmes and practice session design to better prepare players for match play, and for those making the transition to higher age categories. However, they also indicate a need for more refined, position-specific training programmes. Some studies have also highlighted the importance of considering individual differences associated with maturity status of female youth players during development, such as peak height velocity, highlighting differences between age groups that can be used to inform strength and conditioning training (Emmonds et al., 2017; 2020; Malina et al., 2021). Future research may investigate how physical attributes evolve time and their relative importance compared to skill-based and psychological predictors.

Staff responsible for selection decisions should also be cognizant of underlying influences on player performance during development. For example, the Relative Age Effect (RAE) phenomenon suggests that players born earlier in the selection year (often the first quartile of the selection year) are more likely to be identified and selected compared to those born later in the selection year, due to potential advantages in maturation and physical characteristics (Finnegan et al., 2024). While RAEs are

well-documented in male soccer, research on female soccer has offered mixed findings. Some studies have shown significant RAEs (Finnegan et al., 2024; Götze & Hoppe, 2021; Smith et al., 2018), while others have not identified any notable effects in samples from European players (Andrew et al., 2022; Delorme et al., 2010; Romann & Fuchslocher, 2013) or from the U.S. (Korgaokar et al., 2018; Vincent & Glamser, 2006). RAEs may be less prominent in female compared to male soccer due a lower popularity within the sport, resulting in a smaller talent pool, or reduced competition for selection places (Götze & Hoppe, 2021). As participation and popularity of female soccer within England increases, those responsible for talent identification and development should be mindful of this potential selection bias, instead viewing player development from a more holistic perspective (Andrew et al., 2022).

1.6.2 Skill predictors

Technical and tactical skills are crucial for soccer performance, yet studies on their role in female talent development remain sparse. Harkness-Armstrong et al. (2020) observed the technical characteristics of female youth players in England during competitive match play, highlighting differences based on position and age group (U-14 and U-16). At the U-14 level, technical actions were unevenly distributed between positions, with central players performing more actions than wide players, while at the U-16 level, technical skills were more evenly spread across positions. These positional and age-based differences underscore the evolving nature of skill requirements as players progress through the talent pathway, suggesting that skill development is not linear and requires tailored coaching approaches. However, further in-depth exploration is needed to fully understand performance dynamics during gameplay and how these skills develop and adapt at different stages (Harkness-Armstrong et al.,

2020; 2022). Moreover, alongside physical attributes, Höner et al. (2019) tested the prognostic relevance of various skill characteristics of 499 U-12 players on the German talent pathway, finding that ball control and dribbling abilities were strong predictors of later performance at the U-17 level. This suggests that early technical proficiency in key areas may be crucial for the long-term development of female players, particularly in predicting future success at higher levels of competition.

In addition to technical skills, the role of perceptual-cognitive skills, such as anticipation, game intelligence and decision-making, has largely been overlooked in female soccer research, despite being critical for high-level performance during game-specific contexts (Williams & Ericsson, 2005). One study by van Maarseveen et al. (2018), involving 22 female youth soccer players, found that tests of perceptual-cognitive skills did not predict *in situ* performance, raising questions about how best to assess and develop these abilities for real-game scenarios. Further research within this area is required to explore the perceptual-cognitive capacities of female soccer players, to provide a gender-specific understanding on how these skills may influence immediate and future performance, and how they can be trained effectively.

1.6.3 Psychological and sociological influences

1.6.3.1 Psycho-social influences

Psychological and sociological factors influencing female player development have largely been combined and integrated within the literature to explore psycho-social influences. This topic has also received an increase in research attention, though female populations remain underrepresented in comparison to those in the male game (Emmonds et al., 2023; Gledhill et al., 2017). Contextualised, this predominantly

qualitative body of work specifically suggests that talent identification and development outcomes are shaped, positively or negatively, by the interplay between social influences (e.g., peers, parents, siblings, coaches) and individual psychological traits (e.g., mental toughness, self-control), which guide behaviours such as performance and lifestyle choices (Gledhill et al., 2017). In the U.K., parents and siblings of female youth players were found to play a pivotal role in encouraging initial participation in soccer and provided ongoing social support and guidance throughout player development (Gledhill & Harwood, 2014). Social circles outside of soccer, particularly friends, also had a notable influence. Friends who supported disciplined lifestyle choices positively affected sustained soccer engagement (Gledhill & Harwood, 2014), whereas those who discouraged this were cited as a contributing factor towards unsuccessful transitions to senior level (Gledhill & Harwood, 2015). Thus, self-control can positively influence player development through appropriate lifestyle choices and commitment to soccer (Gledhill & Harwood, 2014; Wolff et al., 2019). Self-regulation and reflection were also highlighted as important psychological attributes that can help players navigate transitions throughout their soccer journeys (Gledhill & Harwood, 2014; McGreary et al., 2021). Therefore, the development of these attributes within club settings should be encouraged (Emmonds et al., 2023).

However, due to the qualitative nature of this research, studies within this area often rely on small sample sizes and self-reported data, which may introduce bias and limit generalisability. Additionally, most of these studies have also focused on English soccer, offering valuable context-specific insights, but limiting applicability to other nations. Future research studies should aim to validate these findings through alternative methodologies, such as longitudinal studies tracking player development over time, or the addition of quantitative metrics measuring psychological and social

influences. Cross-cultural comparative studies would also enhance the generalisability of findings beyond the English soccer context.

1.6.3.2 Psychological predictors

Some studies have explored psychological factors in isolation. A recent review by Gredin et al. (2023) reported a small but growing number of publications relating to psychology research in female soccer. Recent research into psychological attributes such as grit and mental toughness has gained traction, with studies linking these traits to higher skill levels in players (Danielsen et al., 2017; Kristjánsdóttir et al., 2019). However, the predictive utility of these traits for performance remains limited and context-specific, with much of the existing research being conducted in Nordic countries, thus limiting generalisability to other soccer contexts (Pettersen et al., 2021; 2023). A critical issue within this area is the oversimplification of psychological attributes as static traits rather than dynamic skills that can be developed over time. Future studies may adopt a developmental perspective to assess how psychological characteristics evolve throughout player development and how they may interact with external factors such as coaching.

1.6.3.3 Dual-careers

Within the female soccer literature, sociological research has explored a variety of topics, including education. Qualitative research on female youth players from the U.K. has revealed numerous important insights. Notably, some players have been discouraged, predominantly by teachers, from pursuing a career in soccer due to a lack of opportunities in the female game, which may contribute to dropout among other factors, such as role strain (Gledhill & Harwood, 2015; McMahon et al., 2023). The

integration of dual-careers, whereby athletes combine education or employment alongside a sporting career, has emerged as a critical issue, especially in light of the relatively short career spans of professional soccer players and early retirement ages (approx. 30-40 years old; Harrison et al., 2020). Dual-careers are particularly essential for female players, given the large disparity in pay when competing at a professional level between male and female players (Harrison et al., 2020), as well as the difficulty in securing stable and well-paid post-retirement career opportunities (McCormack & Walseth, 2013). In pursuing a dual-career, female players have reported varied levels of support from clubs and academies (Harrison et al., 2020) and have faced demands in balancing education with soccer, leading to dropouts or unsuccessful career transitions (Gledhill & Harwood et al., 2015; McGreary et al., 2021). Therefore, clubs and governing bodies must better support dual-career pathways to ensure players can pursue long-term career options alongside soccer. Further research can facilitate this process via more systematic and longitudinal investigations of dual-career pathways and how they can be optimised.

1.6.3.4 Birthplace effects

The concept of birthplace effects as a sociological predictor of future expert performance has received little research attention in the female soccer literature. Birthplace effects suggest that an individual's place of birth can significantly shape their opportunities and pathways in soccer development and success (Côté et al., 2006). These effects are influenced by factors such as local infrastructure, resource availability, community size and density, and accessibility to practice and competition opportunities (Smith & Weir, 2020). Recent research in Brazil has suggested that players born in small cities and large urban areas had a greater chance of playing in

the top division (Teoldo et al., 2023). However, the specific mechanisms driving these birthplace effects remain unclear. Moreover, given the unique structural and socio-cultural differences in soccer participation across nations, findings from one female soccer context may not generalise to another. The extent to which birthplace influences talent identification and long-term development in female soccer remains largely unexplored. A more nuanced understanding of these effects could provide valuable insights for tailoring talent development strategies to different regional and community settings, ensuring that talent identification efforts are more inclusive and effective.

1.6.3.5 Hours in practice

The hours that a player accumulates in soccer-specific activities throughout their development has been identified as an important sociological predictor of future performance. Within female soccer, retrospective research examining the developmental engagement of players has highlighted important patterns in the quantity and nature of their participation in soccer activities. Güllich (2019) reported that German national team players accumulated a greater number of hours in both peer-led soccer play, and practice in sports external to soccer, compared to first division players, suggesting the value of diverse athletic engagement. Additionally, Hendry et al. (2019a) highlighted that both Canadian national team and varsity players amassed more hours in formal practice and competition than in play activities. Ford et al. (2020a) conducted a broader investigation of the developmental engagement profiles of professional players from Australia, Canada, England, Sweden and the U.S., revealing that practice hours increased as players progressed, while engagement in play decreased. Notably, Andrew et al. (2024a) revealed that professional players

from England engaged in soccer earlier, accumulated more hours in practice and play during childhood, and in practice during adolescence, compared to those who did not progress to professional status.

Collectively, these studies underscored the importance of early engagement in soccer, as most professional players began participation early in childhood (approximately age 5 years), and soccer remained the primary participation sport throughout development (Ford & Williams, 2023). However, a notable challenge in these studies is the reliance on retrospective recall, often requiring players to remember participation details from their youth. Given the average age of players in these studies is approximately 25-26 years, estimates of their participation histories and developmental experiences are from at least a decade prior, raising concerns about the accuracy of this recall. Consequently, our knowledge of the talent pathways that these players progressed through may be outdated. Furthermore, the focus of existing research has been on differentiating higher-skilled from lower-skilled players, rather than optimising talent pathways for future development. Therefore, investigating the experiences of current youth players would likely reduce retrospective recall error and provide contemporary insights into current talent pathways. This is critical in nations such as England, where the youth development landscape has changed and evolved significantly within the last decade. Additionally there is a need for greater consideration of the quality of practice experiences, as opposed to purely quantifying practice hours, which do not provide a holistic indication of development experiences when measured in isolation.

1.6.4 Development environment

Research on the development environment, particularly on practice structure and coaching behaviours in female soccer, remains scarce, despite the clear benefits these factors can have on skill acquisition. Güllich (2019) provided the only assessment of practice design conducted in female soccer, with German national team players receiving greater proportions of games-based activities within practice sessions, compared to first division players. Games-based activities are those involving opposition and teammates that closely replicate the demands of competition (Ford et al., 2010a), and are regarded to provide players with increased opportunities to develop perceptual-cognitive skills (e.g., visual search, anticipation, decision making) that are important for match play, in comparison to drill-based activities (i.e., repetition of isolated skills involving limited or no opposition; Ford & Williams, 2023). A more comprehensive and focused analysis of practice design and activities, and of the rationales behind their implementation, could have important implications for the development of female youth players. While Güllich (2019) offered initial insights on practice structures within female soccer, time spent moving between activities (i.e., in transition) were not accounted for. These periods should therefore be considered to provide a more precise indication of the proportion of time allocated to skill development and practice (O'Connor et al., 2018).

Furthermore, there has been no investigation of the behaviours employed by coaches within practice sessions of female youth soccer players, despite their well-documented influence on skill acquisition and learning (Larkin et al., 2022). For example, the provision of delayed augmented feedback can encourage players to initially rely on their own task-intrinsic feedback mechanisms, which can foster problem-solving and self-correction abilities (Williams & Hodges, 2005). Given that such coaching behaviours can directly and positively impact player development, this

gap in research raises concerns about whether current coaching practices in female youth soccer are optimally aligned with the developmental needs of players. However, it remains unclear whether such approaches are being effectively implemented within female soccer environments. Therefore, a detailed assessment of both practice structure and coach behaviours is required within female youth soccer to understand the existing development environment and to guide the future growth of the game through evidence-informed recommendations. A mixed-methods approach, consisting of systematic observations of coach-led practice sessions and follow-up interviews with coaches, can provide a more holistic understanding of these aspects within the female game. While such approaches have provided key insights when implemented within male soccer (e.g., Partington & Cushion, 2013; Partington et al., 2014; Stonebridge & Cushion, 2018), it remains uncertain whether these findings can be directly applied to the female game. Without targeted research, there is a risk that coaching practices in female soccer may be shaped by assumptions derived from male-focused models, rather than being tailored to the specific needs of female players.

In reviewing the current talent identification and development literature specific to female soccer contexts, it is clear that many gaps in knowledge exist. For example, the lack of research on technical and tactical skill development, psychological attributes, and sociological factors suggests a narrow lens through which talent development in female soccer is understood. While many studies have identified potential predictors of later expertise or identified differentiating variables between players that attained professional status and those that did not, these findings often overlook the developmental processes and pathways that shape these outcomes. Understanding the structure, characteristics and processes that occur along these pathways can provide a detailed understanding of the current talent identification and

development landscape. Such insights are key not only for improving talent identification and development frameworks, but also for guiding future research and addressing the evolving needs of the female game.

1.7 Models and frameworks

Existing data on female soccer players can sometimes deviate from predictions in current athlete development models (Peters et al., 2022). Nevertheless, several theoretical and conceptual frameworks underpin the research in the following investigative chapters.

1.7.1 Deliberate Practice Framework

In sport, practice allows athletes to refine techniques and build proficiency over time and is therefore the foundation for effective skill acquisition. One type of practice that has been extensively researched in a variety of domains, including sport, is deliberate practice. Deliberate practice is a highly structured and focused approach to improving performance in a specific skill or domain, involving the setting of clear goals, receiving feedback from a knowledgeable coach, and continually pushing one's limits to enhance abilities (Ericsson et al., 1993). Key to this framework is the emphasis on the quality of practice alongside quantity, with the goal of making incremental improvements over time (Young et al., 2021). According to deliberate practice theory, innate talent alone is rarely sufficient to become an expert in a given domain; rather, it is disciplined, structured and purposeful practice that leads to skill mastery (Baker & Young, 2014).

Three constraints characterise deliberate practice: (1) the resource constraint, which emphasises the need for sufficient support and access to necessary resources; (2) the effort constraint, recognising the demanding and effortful nature of deliberate practice; and (3) the motivational constraint, which acknowledges that while deliberate practice may not be inherently enjoyable, performers engage in it due to its effectiveness in improving their skills. In addition to these constraints, the monotonic benefits assumption postulates that time accumulated in deliberate practice activities is positively and monotonically related to performance, highlighting the importance of maximising practice time (Ericsson et al., 1993).

1.7.2 Developmental Model of Sport Participation

The Developmental Model of Sport Participation (DMSP) provides a framework for understanding the different sport-specific pathways that young athletes can follow to achieve success and personal satisfaction (Côté, 1999; Côté et al., 2007). The model proposes three distinct developmental pathways through sport participation: (1) recreational participation through early sampling of multiple sports and deliberate play (i.e., intrinsically motivating peer-led play activities designed to maximise enjoyment); (2) elite performance through early sampling and deliberate play; and (3) elite performance through early specialisation (i.e., an intense focus on one sport) and deliberate practice (Côté, 1999; Côté et al., 2003; 2007; 2009; 2012).

On the pathway towards expert performance, the DMSP outlines different stages based on the amount and type of participation for athletes that do not specialise early in one sport (Côté et al., 2012). These stages include: the sampling phase (age 6-12 years), with an emphasis on enjoyment, motivation and play in a range of sports and activities to develop a broad range of transferable motor, physical, cognitive and

social skills; the specialising phase (age 13-15 years), characterised by a focus on structured practice within one or two sports that athletes particularly enjoy or excel in; and the investment phase (age 16+ years), during which athletes will commit to one sport and engage in deliberate practice to improve performance (Côté et al., 2009). This framework emphasises the importance of both play and practice in developing a broad range of transferable physical, cognitive, and social skills during early development.

1.7.3 Challenge Point Framework

Originally conceptualised by Guadagnoli & Lee (2004), the Challenge Point Framework (CPF) posits that optimal learning occurs when the difficulty of a task (i.e., nominal difficulty) is matched to the difficulty of the skill relative to the learner (i.e., functional difficulty). If a task is too difficult, learners may become overwhelmed or discouraged, hindering learning; whereas tasks that are too easy offer insufficient challenge or opportunities for growth. The CPF is comprised of three key ideas: (1) task difficulty can be adjusted to match the skill level of the learner; (2) the learning environment can be manipulated to create an optimal challenge level; and (3) individual differences should be acknowledged to appropriately tailor the level of challenge. At the optimal challenge point (Guadagnoli & Lee, 2004), or within the optimal challenge zone (Hodges & Lohse, 2022), learners operate just beyond their comfort zone, maximising learning, even if it temporarily impairs immediate performance. The CPF has been operationalised for application within sport by Hodges & Lohse (2022), to assist coaches in designing practices that appropriately challenge players in different phases of learning (practice to learn, maintain, or transfer

skills). By targeting the optimal level of difficulty, the CPF can help ensure athletes remain motivated and engaged in their development.

1.8 Contextual considerations

This thesis has a focus on talent identification and development issues within England due to significant variations in talent development systems between nations, with each characterised by unique processes and structures. Research by McEwan et al. (2024) highlighted differences in female soccer academy structures and player pathways between multiple European nations, including France, Germany, Italy, Spain, and Sweden. The number and nature of youth age categories that academies provided for players differed between most clubs, with some catering to players as young as 6 years, while others only started provision to players aged 14 years, highlighting the variety of structures and strategies between nations. Similarly, in some European nations, including England, youth players are recruited and nurtured from an early age, with clubs making substantial investments in both infrastructure and coaching. In contrast, players from nations such as Brazil often develop through informal settings, such as street soccer, before transitioning into more structured youth systems. Moreover, the U.S. has adopted a different approach, having prioritised school-based or collegiate systems for player development. These variations may reflect a range of factors, such as talent pool size, accessibility to structured practice environments, financial resources, sport history, and underlying philosophies (Bennett et al., 2019; Kelly et al., 2023). As a result, a universal or 'one size fits all' approach to talent identification and development may not reflect the diversity of soccer participation (Kelly et al., 2023). Instead, a nuanced, nation-specific understanding of talent identification and

development issues should be prioritised to progress the game, with consideration of unique cultural influences and challenges that are characteristic of that particular nation.

The need for gender-specific research is especially pressing, as there remains a significant gap in understanding talent identification and development processes in female athletes (Baker et al., 2020; Johnston et al., 2018; Williams et al., 2020). Given the recent acceleration in growth, interest and investment in English female soccer, alongside various structural changes, it is a critical moment to study, evaluate, and refine youth development pathways leading to senior levels, and understand the challenges faced by clubs and academies. Despite such growth, many clubs still lack the financial capacity to simply obtain the most talented players at both youth and senior level (Department for Culture, Media and Sport, 2023). This places a greater emphasis on developing players from within female soccer youth systems. As the size of the talent pool increases, more players will transition through these systems, making it imperative for clubs to establish, develop, and refine their academy environments and talent pathways utilising evidence-based recommendations, and with gender as a primary consideration.

This thesis will explore a range of factors that influence talent identification and development in female soccer, including developmental processes, activities, trajectories, and practice structures, to better understand the specific needs of female players. Gaining a deeper understanding of these factors is key to advancing talent identification strategies and player development. Due to the paucity of research in this area, exploratory and descriptive research studies are required to build foundational knowledge and guide further investigations. This type of research is critical for

generating insights into new, complex and unexplored topics, offering the basis for informed decision-making and future inquiry.

1.9 Thesis aims

The preceding sections of this introductory chapter have provided essential background information and a cohesive overview of existing talent identification and development literature relative to female soccer, providing a contextual foundation for the investigative chapters that follow. Research within female soccer has predominantly focused on physical predictors of expert performance, and psycho-social influences throughout player development. However, there remains a significant gap in our knowledge pertaining to the talent identification and development pathways that female youth players navigate.

The overarching aim of this thesis is to examine the talent development pathways that current female youth soccer players in England progress through and assess the impact of this pathway on their skill acquisition and development. Specifically, the research will adopt a broad-to-narrow focus, aiming to extend our knowledge of the processes that clubs implement to identify and develop talent, the developmental pathways and trajectories of players currently progressing through youth systems, and the role that coaches and academy environments play in facilitating player development. The scope of this research is limited to elite youth soccer academies affiliated with professional women's teams in England, focusing on age groups up to the U-18 level. Grassroots soccer, although important, will not be included, nor will comparisons with academies outside of England. In addition, to achieve a comprehensive understanding, this thesis will engage multiple stakeholders,

from players, to the coaching staff and academy directors that are responsible for their development.

1.9.1 Chapter Two aims

Chapter Two will outline the methodological approach and underlying assumptions underpinning the work conducted in this programme of research. It will introduce paradigms, discuss the chosen paradigm of pragmatism that guided the work within the thesis, and provide an overview of the methodological approach used within each research study.

1.9.1 Chapter Three aims

Chapter Three seeks to explore the structural characteristics and processes occurring within the talent identification and development systems of English female soccer academies. Specifically, this chapter will investigate academy objectives, the provisions in place, and the structural elements that shape the talent pathway. Additionally, challenges related to player recruitment and development, as well as deselection processes, will be examined to explore issues related to player retention.

1.9.2 Chapter Four aims

Building on previous research, Chapter Four will focus on the developmental engagement of female youth players, particularly the hours dedicated to soccer and other sport activities during their formative years. While existing research studies have explored the participation histories of professional players (Andrew et al., 2024a; Ford et al., 2020a; Güllich, 2019; Hendry et al., 2019a), they provide an outdated insight into engagement patterns along development pathways. In light of recent structural

changes in elite female youth soccer within England, this chapter will explore key developmental milestones and current engagement patterns among youth players.

1.9.3 Chapter Five aims

Chapter Five aims to investigate the role of coaches in shaping player development through a mixed-methods approach. In particular, the practice structure and coaching behaviours that coaches employ within sessions across multiple age groups will be systematically observed. In addition, semi-structured interviews as part of tailored video feedback sessions provided to coaches will delve into the rationales behind chosen practice designs and coaching behaviours, offering insight into how these factors influence player development.

1.9.4 Chapter Six aims

Chapter Six will synthesise findings from the preceding chapters and contribute to the broader discussion around talent identification and development in English female soccer as the game continues to grow. This chapter will also outline the implications of the research findings, propose recommendations for enhancing talent identification and development practices, and highlight areas for future research that could further inform the progression of the game.

1.10 Chapter summary

In closing, this introductory chapter has provided a historical and contextual overview of female soccer in England, alongside a review of existing literature on talent identification and development within the sport. It has outlined a clear

underrepresentation of female soccer-specific investigations within the literature, with most studies focusing on physical and technical predictors of future expert performance. While these areas remain important given the sport's continued growth and increasing research attention, this chapter has highlighted a significant gap in understanding the specific processes occurring within female soccer development environments. Addressing this gap, the primary aim of this thesis is to explore the talent development pathways that current female youth soccer players in England navigate. The following chapter will provide an overview of the methodological approach used throughout the thesis.

2 Methodology

2.1 Chapter overview

This chapter outlines the philosophical and methodological foundations underpinning the research conducted in this thesis. It begins by introducing the concept of research paradigms, discussing their philosophical assumptions and contrasting different approaches. The chapter then justifies the adoption of pragmatism as the guiding paradigm, highlighting its flexibility and practical applicability for addressing the complex, real-world processes of talent identification and development in female youth soccer. Finally, the chapter provides an overview of the methods used across the different research phases, explaining how each methodological choice aligns with the pragmatic philosophy.

2.2 Research paradigms

A research paradigm is a fundamental framework or worldview that guides and shapes how knowledge is generated, interpreted, and validated within a field of study (Guba & Lincoln, 1994). This framework influences both the research process and the researcher's perspective, guiding methodological choices and the interpretation of findings (Cresswell, 2013). Paradigms are underpinned by philosophical assumptions including ontology, epistemology, and methodology (Lincoln & Guba, 2000; Lincoln et al., 2011; Morgan, 2014). Ontology, the study of reality, refers to what exists and how it can be understood. It shapes how researchers conceptualise their subject matter. For example, a researcher with a positivist ontology assumes that reality is objective and measurable, leading them to adopt quantitative methods such as experiments or surveys. Conversely, an interpretivist ontology views reality as subjective and socially

constructed, favouring qualitative methodologies, such as interviews or case studies, to capture individual or group experiences. By defining their ontological stance, researchers clarify their assumptions about what they are capturing through research. Epistemology concerns the nature of knowledge and how it is acquired, with consideration of what counts as valid and credible evidence in a given research study. A researcher's epistemological stance influences how data can be collected, how findings are interpreted, and how conclusions are drawn. Establishing an epistemological standpoint provides a rationale and justification for the adopted methodological approach, and outlines what is considered relevant by the researcher. Methodology refers to the strategies and techniques used to collect and analyse the phenomenon of interest. It is shaped by the ontological and epistemological assumptions guiding the research, which subsequently determine how the research will be conducted. These philosophical assumptions form the foundation of different research paradigms, which shape the overall approach to conducting research.

Two dominant paradigms in social science research are positivism and interpretivism. Positivism is rooted in the belief that reality is objective and can be understood through empirical observation and measurement. This paradigm typically employs quantitative methods to test hypotheses and establish generalisability. In contrast, interpretivism emphasises subjective experience and the socially constructed nature of reality, prioritising qualitative approaches to capture meaning and context (Cresswell & Plano Clark, 2011; Lincoln & Guba, 2000; Lincoln et al., 2011). This approach seeks to understand how individuals interpret and experience the world, making it particularly relevant for exploring human behaviour and experiences. While both paradigms can offer valuable insights, their limitations become apparent in applied research contexts, such as talent identification and development in soccer. A

strictly positivist approach may overlook the nuanced, experiential aspects of development pathways, such as the influence of social and environmental factors. Conversely, a purely interpretivist stance may capture rich, contextual experiences, but can lack the generalisability needed to inform broader talent pathway processes and strategies. To overcome these challenges, this programme of research adopts pragmatism, a paradigm that facilitates methodological flexibility and integration to generate knowledge and insights.

2.3 Pragmatism as the chosen paradigm

This thesis adopts a pragmatic, mixed-methods approach across multiple studies to investigate talent identification and development pathways in female youth soccer. As a research philosophy, pragmatism prioritises practical solutions and methodological flexibility, advocating for the use of research strategies that are most effective for answering specific research questions (Morgan, 2007; 2014; Creswell & Plano Clark, 2011). By mixing different methodologies and philosophies, pragmatism offers a middle ground on the continuum between positivism and interpretivism. From a pragmatic perspective, the focus is less on the nature of reality and more on the significance of actions and their resulting consequences (Morgan, 2014). Pragmatism rejects rigid adherence to a single epistemological or methodological paradigm (Cresswell, 2014), instead promoting methodological pluralism by enabling the integration of quantitative and qualitative methods to generate meaningful insights. A core tenet of pragmatism is its focus on ‘what works’ in practice, enabling researchers to select methods and research strategies based on their effectiveness in addressing

real-world issues and complex phenomena (Dewey, 2008; Morgan, 2007; 2014; Tashakkori & Teddlie, 2010).

Naturally, like any other paradigm, pragmatism has been critiqued as a philosophical approach. The main concern with pragmatism is its emphasis on 'what works', which has been argued to reduce knowledge claims to mere usefulness, which can be problematic (Morgan, 2014). If truth is simply what is useful, it risks collapsing into subjective or socially constructed realities with no firm grounding. However, John Dewey viewed truth as provisional and evolving. That is, what works today may not work tomorrow, but this doesn't mean there is no truth, only that it is contextual (Biesta, 2010; Cresswell & Cresswell, 2018). By focusing on practical outcomes, pragmatism embraces the idea that all knowledge is subject to revision, which makes it more adaptable to new evidence or changing contexts. This flexibility and adaptability is a key strength of a pragmatic approach, making it a well-suited and relevant paradigm for exploring dynamic fields, such as the continually evolving landscape of female soccer.

In this regard, pragmatism is particularly relevant to applied fields where complex and multifaceted processes need to be understood. In soccer, talent identification and development are multidimensional processes influenced by various factors such as the development environment, player engagement patterns, and coaching methods. In this context, a pragmatic approach allows the research to integrate quantitative methods to provide broader trends across academies, with qualitative insights that can offer a deeper understanding of coaching practices. This mixed-methods design ensures that findings are both statistically robust and contextually meaningful which is particularly beneficial in talent identification and development research, where data-driven insights must be actionable for practitioners

while also contributing to theoretical knowledge in an under researched area. Moreover, given the complex and multifaceted nature of talent identification and development, pragmatism allows for the selection of methods best suited to each research question. For example, large-scale surveys offer broad, generalisable insights into the structure of talent pathways and academies, while interviews and observations provide nuanced, experience-based insights into the day-to-day practices of coaches. This methodological flexibility ensures that the research captures both macro-level trends and micro-level experiences, making the findings more applicable and actionable for practitioners.

2.4 Overview of methods used in the thesis

The research progressed in phases, with each enquiry employing methods aligned with pragmatism's emphasis on selecting the most effective approach for answering specific research questions. Chapter Three utilised a survey-based approach to understand broad trends across female soccer academies regarding their talent identification and development processes. A quantitative survey was chosen to allow for the collection of standardised, large-scale data, facilitating comparisons between academies and identifying overarching patterns (Creswell, 2014). This approach aligns with pragmatism by providing foundational and generalisable insights into how talent pathways and academies in England are structured.

Building on these insights, Chapter Four employed a structured questionnaire to examine critical soccer milestones and player engagement patterns across different development stages. This method was chosen to enable quantitative analysis of patterns in player progression, providing deeper insights into developmental

trajectories of current youth players. A structured, data-driven approach was chosen to ensure that findings are both empirically grounded and applicable to real-world player development models.

Finally, Chapter Five integrated systematic observations of coach-led practice sessions with semi-structured interviews with coaches to explore activity structure and behaviours used within female soccer academies. This mixed-methods approach was selected to balance objective behavioural analysis (quantitative observation data) with subjective experiential insights (qualitative interviews) to produce a more holistic understanding of coaching practice. The combination of methods allowed the research to capture both measurable activity design and coaching behaviours (i.e., what coaches do) and the coaches' underlying motivations and rationales behind their practice (i.e., why they do it), ensuring a more comprehensive depiction of coach-led practice in female youth soccer.

By consciously employing a pragmatic, mixed-methods approach, this research captures both broad patterns and contextual insights in talent identification and development within female youth soccer by combining the strengths of both quantitative and qualitative methods (Morgan, 2014). Moreover, the flexibility of this approach allowed for iterative refinements, ensuring that data collection remained responsive to emerging insights throughout the research process to produce a holistic understanding of talent pathways and contribute to both academic scholarship and practical applications within female soccer academies. The findings of this research, discussed in the final chapter, offer valuable insights and actionable recommendations for optimising talent development strategies within female soccer, bridging the gap between research and application.

2.5 Chapter Summary

This chapter has outlined the philosophical foundations underpinning this research, focusing on ontological, epistemological, and methodological assumptions. Given the complexity of talent identification and development, this research adopts a pragmatic approach to allow for the integration of quantitative and qualitative methods. This ensures that study design is focused on how to effectively answer the research questions that are posed to aid the generation of statistically robust and contextually meaningful findings. The following chapters will present the studies conducted to achieve this aim, beginning with an exploration of the talent identification and development practices currently implemented within academies, as outlined in Chapter Three.

3 Talent identification and development processes of female soccer academies from the top three tiers in England

***The work in this chapter has been accepted for publication**

3.1 Chapter Overview

Building on the contextual and methodological overviews in the first two chapters, the following chapter presents the first empirical study of this thesis, which examines the current talent identification and development practices within female soccer academies in England. This chapter aims to provide a broad and in-depth understanding of the structure, strategies, and processes implemented at the academy level, offering insight into the environments through which young female players progress. By exploring these key elements, this chapter establishes a foundation for the subsequent investigations into talent development pathways within the sport.

3.2 Abstract

With the continued growth and professionalism within female soccer in England, the need to optimise talent identification and talent development processes has become increasingly critical. However, there remains a dearth of information regarding how clubs identify and nurture talent within their academies (Curran et al., 2019), limiting understanding of key processes that influence player progression. This study aimed to address this gap by exploring current practices of talent identification and development across female soccer academies affiliated with clubs in the highest three league tiers in England. Academy directors from 26 clubs completed a 31-question online survey that assessed club structure, recruitment and development strategies, as well as player attrition. Data were analysed using descriptive statistics for multiple-choice (n = 13), checkbox (n = 7), and Likert scale (n = 5) questions, alongside thematic analysis of open-ended questions (n = 6) to identify differences across age

categories and league tiers. Findings highlighted a scarcity of dedicated recruitment departments in youth structures, limiting selection decisions to coaches and academy directors. While recruitment efforts focused increasingly on senior team preparation at older age categories, clubs consistently prioritised the personal development of players across all ages. Recruitment and development practices became more professionalised and multidisciplinary at higher age categories and league tiers. However, clubs continue to navigate challenges as they endeavour to expand and optimise these processes. These findings provide a benchmark for the current talent identification and development landscape in English female youth soccer and build the foundation for ongoing dialogue and initiatives aimed at enhancing and refining the talent pathway to ensure sustainable growth within the sport.

3.3 Introduction

Identifying talented youth soccer players that have the potential to progress through a high-performance development environment to the first (i.e., senior) team and contribute to future success is a critical process that occurs within professional soccer academies (Williams et al., 2020). The objective of these academies is to cultivate an environment conducive to nurturing the technical, tactical, physical, and psychological skills of young players, to supply talent for senior teams and/or generate revenue through sales (Relvas et al., 2010). During this process, practitioners responsible for player development (i.e., coaches, academy directors) monitor and evaluate soccer-specific skills of their players and make decisions on player (de)selection and retention (Williams et al., 2020). To support practitioners, researchers have endeavoured to provide evidence-based information that can be translated into practice (Emmonds et

al., 2019), however this has primarily focused on male soccer. Although steadily increasing, there is still an underrepresentation of research using only female athletes (Curran et al., 2019; Okholm-Kryger et al., 2020; Peters et al., 2022). Differences in growth and maturation influences the biopsychosocial development of girls and boys differently (Lloyd & Oliver, 2012; Cowley et al., 2021), making it difficult to extrapolate findings from male to female soccer (Emmonds et al., 2019; 2023). Thus, calls for an increase in female-soccer-specific research have been made (Williams et al., 2020; Randell et al., 2021).

In recent years, research examining talent identification and development in female soccer has typically focused on players' physical and technical skills as future predictors of expert performance (Emmonds et al., 2017; Höner et al., 2019; Datson et al, 2020; Harkness-Armstrong et al., 2020; Leyhr et al., 2020), chance events such as the relative age effect (Andrew et al., 2022; Finnegan et al., 2024), as well as the amounts and types of activities players engage in during their development (Ford et al., 2020a; Andrew et al., 2024). Moreover, psycho-social investigations have highlighted the importance of social interaction and support throughout player development, the demands of managing education and/or employment with a soccer career, and a positive player perception of their soccer environment (Gledhill & Harwood, 2014; 2015; 2019; Harrison et al., 2020; McGreary et al., 2021). While information on potential future predictors can provide reference values of future adult expert performance, detailed examinations of the aims and structure would provide evidence of the current talent identification and development landscape (Bennett et al., 2019; Ford et al., 2020b; Finnegan et al., 2024). In exploring contemporary practices, this research draws on a theoretical framework outlining key elements of the talent identification and development process within soccer (Williams et al., 2020), focusing

specifically on: (1) talent identification, the process of recognising players with the potential to progress into and through a high-performance development environment; (2) talent development, provision of an environment and development programme designed to progress players towards higher performance levels; and (3) deselection, the process of removing players from a development programme who no longer demonstrate the required attributes to progress.

Over the last decade, female soccer in England has seen significant growth and transformation, and remains one of the most popular sports for women and girls, through increased attendances (live and television), social media, investment, and sponsorship (Fink, 2015). This exponential rise in popularity may be attributed to the recent success of the senior national team at the recent European Championship (2021; Winners) and World Cup (2023; Runners-up). Furthermore, the women's game in England has seen an increase in professionalism, including the creation of the Women's Super League in 2011 and opportunities for players to sign full-time professional paid contracts in 2018, which have elevated soccer as a viable career opportunity for girls (Culvin, 2023; Fielding-Lloyd & Woodhouse, 2023). At youth level, The English Football Association (The FA) has implemented reformations to their talent pathways and produced numerous female-soccer-specific initiatives over the last decade to increase the number of technical staff, registered players, and playing time (The FA, 2017; 2020; 2021; 2023b). These strategies aim to support talent identification and development processes within clubs, by augmenting opportunities, and enhancing the pathway experience for players within youth structures to facilitate sustainable growth of the game. Therefore, a thorough survey of identification and development processes within female soccer academies in England is well-timed.

The aim of the present study is to understand the current talent identification and development processes (i.e., objectives; provisions; structure) employed by female youth soccer academies in the highest three tiers of soccer in England. Given the limited literature examining talent identification and development in female-only soccer (Curran et al., 2019), and the recent reformation of youth pathways of clubs in England, we have forgone making any a priori hypotheses.

3.4 Methodology

3.4.1 Participants

A total of 26 academy directors, heads of youth, and academy managers from clubs in the highest three tiers of the female soccer pyramid in England responded to the survey. These roles were specifically targeted due to their expertise and direct oversight of talent identification and development processes within youth structures (Relvas et al., 2010). At senior level, the soccer pyramid consists of the Women's Super League (WSL; Tier 1); the Women's Championship (WC; Tier 2), the Women's National League Northern Premier Division (WNL-N; Tier 3), and Southern Premier Division (WNL-S; Tier 3), with each comprised of 12 clubs (The FA, 2023a). From the 48 clubs that were initially invited to participate via email, academy directors from 26 clubs in the WSL (n = 7), WC (n = 8), WNL-N (n = 6), and WNL-S (n = 5) responded to the survey (54% response rate).

3.4.2 Survey and procedure

The online survey used by Ford et al. (2020b) to measure talent identification and development processes in male soccer academies worldwide was modified to be

appropriate for female soccer academies in England. The Ford et al. (2020b) survey was developed by practitioners with over ten years of experience working within professional youth academies from around the world, and with scientific backgrounds. The revised survey was reviewed for content validity (Stoszkowski & Collins, 2016) via three rounds of discussions with the research team, and piloted by an experienced practitioner within The FA that had worked on the female talent pathway for over 5 years. The survey was created and written in English and contained 31 questions including simple multiple-choice (n = 6), multiple-choice (n = 7), checkboxes (n = 7), free text (n = 6), and matrix/rating scale (n = 5) types. An 'other' option was provided for 10 questions and if selected, participants were presented with a free text box to specify their response. The survey was comprised of five distinct sections: (1) respondent characteristics (e.g., experience in soccer; n = 3); (2) club characteristics (e.g., club departments; n = 6); (3) talent identification characteristics and processes (e.g., processes used for player recruitment; n = 9); (4) talent development characteristics and processes (e.g., processes used for player development; n = 9); and (5) deselection characteristics (e.g., reasons for the loss/release of players; n = 4). For 6 questions, participants were asked to provide information on players at all applicable development phases to identify changes in talent identification and development processes across development. Thus, questions were answered using grid/matrix questions for players aged 7-11 years (Foundation Development Phase), 12-16 years (Youth Development Phase), and 17-21 years (Professional Development Phase). Respondents were initially asked whether their club catered for players aged 7-11 years and customised survey routing ensured that respondents that answered 'yes' to this simple multiple-choice question would be asked all questions relating to all age categories (n = 21 academies), whereas respondents that answered 'no' would be

routed via questions relating only to the '12-16 years' and '17-21 years' categories (n = 5 academies). The survey was open from July 2022 to November 2023 (i.e., 2022-23 and 2023-24 seasons). For each club, a primary and secondary contact were identified. The survey was initially emailed to the primary contact at all clubs, and if no response was obtained after three weeks, it was forwarded to the secondary contact. In total, the survey was distributed to 69 contacts from 48 clubs. No response was received from 38 contacts, and 5 responded to our email but did not complete the survey. The 26 respondents completed the survey at a time convenient for them and were advised to liaise with other relevant academy staff members in completing the survey to ensure that responses were consistent, relevant, and transparent (Fowler, 2014).

3.4.3 Data analysis

All survey data were exported to Microsoft Excel. Responses were divided into league tiers. As both the WNL-N and WNL-S are the same tier and only divided on a regional basis, data were combined to form a WNL tier (n = 11). Frequency counts were generated for data from simple multiple-choice, multiple-choice, and checkboxes questions. Consistent with Ford et al. (2020b), we adopted terminology to qualitatively describe the magnitude of the frequencies observed (all = 100% of respondents; most = ≥75%; majority = 55 to 75%; approximately half = ~50%; approximately a third = ~33%; minority = <30%; Starling & Lambert, 2017). Free text responses were thematically analysed through an iterative process. Data were reviewed repeatedly to identify patterns, inductively generate codes, and develop and refine themes following discussions with the research team (Braun & Clarke, 2006; 2012). To address the challenges posed by the brief qualitative responses that were generated, a structured

tabular approach to thematic analysis was employed, ensuring both flexibility and rigour in the analysis process (Robinson, 2021). Median and interquartile range (IQR) values were calculated for rating scale questions and free text questions that gathered numerical answers (i.e., count data). IQR values were reported as a range (Q1 to Q3). Most rating scale questions required participants to rate the importance of specific characteristics or processes. The same 5-point Likert scale was used throughout the survey for these questions (1 = unimportant to 5 = very important). One question required respondents to rank the level of support provided to deselected players, requiring a different rating scale (1 = none to 5 = very high). Annual player turnover rate was measured using the equation: ((number of entering players + number of leaving players)/2)/total number of squad members (Güllich, 2014).

3.5 Results and discussion

3.5.1 Club youth structure

Youth development structures were overseen by academy directors, with most having over 5 years of experience working within soccer (92%), and specifically in female soccer (85%). Consistent with male soccer (Relvas et al., 2010), the majority operated at full-time capacity (69%), although a minority held part-time (23%) or voluntary (8%) positions. The presence of part-time and voluntary roles, albeit limited, may stem from a current shortage of full-time staff on the girls' talent pathway within England, often requiring academy directors to combine duties with coaching responsibilities in a hybrid role, which are common in female soccer (FIFA, 2021). Nevertheless, their key responsibility was to oversee youth departments. Most clubs had medical departments (77%), with the majority having sports science departments (73%), and

around half having psychology (50%), nutrition (46%), and performance analysis (46%) departments. Only a minority had a recruitment department (19%), which may have implications for talent identification processes in female sport (Curran et al., 2019; Williams et al., 2020). While medical and sports science departments were prevalent, specialised staff roles such as nutrition and psychology were more frequent in WSL than lower tiers. These roles are universal within male soccer academies (Relvas et al., 2010; Reeves, et al., 2023), yet are less common in female academies in England, and globally (FIFA, 2021). Conversely, the presence of sports science departments substantially exceeds the global rate for female youth soccer (~25%; FIFA, 2023). Such discrepancies support the utility of sex and nation-specific inquiry into talent identification and development processes.

3.5.2 Talent identification

For WSL and WNL clubs, the primary objectives were to identify players for age-specific teams and those with the potential to play for the first team, with importance ratings increasing as a function of age. In contrast, talent identification objectives differed slightly within WC clubs (**Table 3.1**). Identifying players for age-specific teams remained important across all ages, but identifying players with the potential to play for the first team became less important at 17-21 years. These differences in talent identification objectives suggest variations in strategic focus between league tiers. WSL and WNL academies appear to prioritise the identification of players for long-term internal development and retention, emphasising the progression of players towards the senior team. Whereas, WC clubs appear to adopt a more pragmatic approach, with a focus on immediate gains and suitability of the player to the club. This difference in priorities may reflect the unique challenges faced by WC clubs, such

Table 3.1 Median (*IQR*) importance rating of talent identification objectives at each age category and league tier from 1 (unimportant) to 5 (very important).

	WSL	WC	WNL
Identifying players with the potential to play for the first team			
7-11	Important	Important	Moderately important
	4.0 (3.0-4.0)	3.5 (3.0-4.0)	3.0 (1.0-3.5)
12-16	Important	Important	Important
	4.0 (3.0-5.0)	4.0 (4.0-4.0)	4.0 (2.0-4.0)
17-21	Very important	Moderately important	Very important
	5.0 (4.0-5.0)	3.0 (1.0-5.0)	5.0 (5.0-5.0)
Identifying players who could eventually be sold on to other clubs for financial gain			
7-11	Unimportant	Moderately important	Unimportant
	1.0 (1.0-1.0)	3.0 (2.0-4.0)	1.0 (1.0-3.0)
12-16	Unimportant	Important	Unimportant
	1.0 (1.0-4.0)	3.5 (3.0-4.5)	1.0 (1.0-4.0)
17-21	Of little importance	Moderately important	Unimportant
	2.0 (1.0-4.0)	3.0 (2.0-4.0)	1.0 (1.0-3.0)
Identifying players to meet the needs of age-specific teams			
7-11	Important	Important	Moderately important
	4.0 (1.0-4.0)	4 .0 (3.0-5.0)	3.0 (1.5-4.0)
12-16	Important	Important	Important
	4.0 (4.0-5.0)	4.0 (3.5-4.5)	4.0 (2.0-4.0)
17-21	Very important	Important	Important
	4.5 (4.0-5.0)	4.0 (3.5-4.5)	4.0 (2.0-5.0)
Identifying players best suited to the club's playing style			
7-11	Of little importance	Of little importance	Moderately important
	2.0 (1.0-2.0)	2.0 (2.0-2.0)	3.0 (1.0-4.0)
12-16	Moderately important	Important	Moderately important
	3.0 (2.0-4.0)	3.5 (3.0-4.0)	3.0 (2.0-4.0)
17-21	Important	Important	Moderately important
	4.0 (4.0-5.0)	4.0 (4.0-4.5)	3.0 (3.0-4.0)

as financial constraints, increased competition from other clubs, and a small talent pool size, all of which were reported more frequently as barriers to current practices compared to other tiers. Such challenges may press WC clubs to adopt a short-term approach to talent identification that focuses on addressing immediate needs.

To achieve these objectives, clubs utilised talent identification processes primarily centred around observing players during trials across all ages, indicating a reliance on a traditional player recruitment approach involving observation followed by subjective coach reports (Larkin & Reeves, 2018; Finnegan et al., 2024). This approach relies on coach instinct, which can be insightful (Christensen, 2009; Jokuschies et al., 2017), but can also be arbitrary, challenging to articulate, and may result in unsubstantiated and inconsistent interpretations when used in isolation (Larkin & O'Connor, 2017; Roberts et al., 2019). Combining subjective interpretations alongside objective evaluations of player attributes for a holistic and multidisciplinary assessment has been advocated (Höner et al., 2021; Bar-Eli et al., 2023), as it can yield more refined selection predictions than either approach in isolation (Sieghartsleitner et al., 2019). In addition to trials, recruitment processes became more frequent and professionalised at higher ages, albeit to a lesser extent than in male soccer (Ford et al., 2020b). Processes employed at WSL and WC levels changed as a function of age, from open-door scouting events at 7-11 years (67%; 50%) to medical (71%; 63%), performance analysis (86%; 75%), and physical (71%; 88%) assessments at 17-21 years, further demonstrating that a multidisciplinary approach to talent identification is prioritised at older ages (Ford et al., 2020b). Whereas, WNL clubs were largely limited to trials for players aged 7-16 years (89%), and physical assessments for those aged 17-21 years (55%). A minority of clubs integrated psychological, physiological, and background assessments into player

recruitment procedures. Consequently, certain aspects of player assessments are currently untapped during recruitment processes. Clubs may seek to encourage interdepartmental collaboration to reinforce the subjective evaluations of coaches, and promote multidisciplinary recruitment decisions (Sieghartsleitner et al., 2019).

Selection decisions predominantly involved coaches at most clubs (92%) and academy directors at the majority (69%). For the minority of clubs with recruitment departments, scouts (19%) and heads of recruitment (12%) were also involved. The final decision on player recruitment was typically made by the academy director (73%), with some coaches also involved (50%). Recruitment decisions were evaluated via staff meetings (77%), reflective practice (65%), and analysis of performance metrics (54%), with all methods considered important or very important. A minority of clubs did not evaluate recruitment decisions (12%).

3.5.3 Talent development

The median (IQR) importance rating of talent development objectives for each age and tier showed minimal differences between tiers (see **Table 3.2**). Fostering positive personal growth in players was the salient talent development objective across all ages. There was also an increasing emphasis on nurturing potential first team players and remaining competitive across all competitions and ages. This approach to player development is welcoming, since it provides benefits to player wellbeing and efficient preparation for life outside of soccer in addition to technical and tactical growth (Vallée & Bloom, 2005; Musculus & Lobinger, 2018). In contrast, primary objectives in male soccer have varied, including the development of players for the first team and/or financial gain through sales (Relvas et al., 2010), fostering well-rounded individuals (Mills et al., 2014), and development as soccer players (Brown & Potrac,

Table 3.2 Median (*IQR*) importance rating of talent development objectives at each age category and league tier from 1 (unimportant) to 5 (very important).

	WSL	WC	WNL
Developing players with the potential to play for the first team			
7-11	Moderately important 3.0 (2.0-4.0)	Moderately important 3.0 (2.0-4.0)	Moderately important 3.0 (1.5-4.0)
12-16	Important 4.0 (4.0-4.0)	Important 4.0 (4.0-4.0)	Important 4.0 (4.0-4.0)
17-21	Very important 5.0 (5.0-5.0)	Very important 5.0 (4.5-5.0)	Very important 5.0 (4.0-5.0)
Developing players who could eventually be sold on to other clubs for financial gain			
7-11	Unimportant 1.0 (1.0-1.0)	Of little importance 1.5 (1.0-3.0)	Unimportant 1.0 (1.0-3.5)
12-16	Unimportant 1.0 (1.0-3.0)	Moderately important 2.5 (1.0-3.0)	Unimportant 1.0 (1.0-4.0)
17-21	Of little importance 2.0 (1.0-4.0)	Important 3.5 (2.0-4.0)	Unimportant 1.0 (1.0-4.0)
Having a positive impact upon the personal development of players			
7-11	Very important 5.0 (5.0-5.0)	Very important 4.5 (4.0-5.0)	Very important 5.0 (3.5-5.0)
12-16	Very important 5.0 (5.0-5.0)	Very important 5.0 (4.0-5.0)	Very important 5.0 (4.0-5.0)
17-21	Very important 5.0 (5.0-5.0)	Very important 5.0 (4.0-5.0)	Very important 5.0 (4.0-5.0)
Remaining competitive across all competitions and age groups			
7-11	Moderately important 3.0 (3.0-4.0)	Moderately important 3.0 (1.0-4.0)	Of little importance 2.0 (2.0-3.0)
12-16	Important 4.0 (3.0-4.0)	Important 4.0 (3.0-4.0)	Important 4.0 (3.0-4.0)
17-21	Important 4.0 (4.0-4.0)	Important 4.0 (3.5-5.0)	Important 4.0 (3.0-5.0)

2009). However, profit driven player development was not a priority within female soccer, only gaining significance at higher age categories for WC clubs. This may be a result of inadequate compensation systems that prevent clubs from receiving any financial gain from players transferring to other clubs, thus reducing the incentive. Only from the 2023-24 season have The FA introduced a system entitling clubs to a 'recognition fee' for departing youth players (Ovaisi, 2023), although this does not extend to WNL clubs, which is reflected by the unimportance of player sales within these youth structures.

To achieve these goals, clubs implemented talent development processes akin to those in male youth soccer (Ford et al., 2020b). All clubs provided frequent coach-led practice, games-based practice activities, and organised competition to develop players (Güllich, 2019). Small-sided games (96%), fitness-based (92%) and drill-based practice activities (76%), strength and conditioning support (88%) and performance analysis (76%) were provided by most clubs, and educational support (72%) by the majority. Approximately half provided nutritional (52%) and psychological (44%) support. Most (81%) reported training provision for foundation phase players (7-11 years), exceeding the global rate (35%; FIFA, 2021), which may be attributed to enhanced popularity, demand, and youth structure capacity, or an increased propensity for early specialisation or engagement in soccer within England (e.g., Ford et al., 2012; Kelly et al., 2023). Moreover, both frequency and duration of weekly practice sessions increased as a function of age and league tier (**Table 3.3**). WSL clubs offered the most comprehensive practice provision for all ages, providing approximately one extra session per age group. Talent development processes were more holistic and multifaceted at higher tiers. For instance, all WSL and WC clubs provided strength and conditioning support, compared to the majority of WNL clubs

Table 3.3 Median (*IQR*) number and duration of weekly practice sessions at each league tier.

	WSL	WC	WNL
No. of weekly practice sessions			
7-11	2.0 (2.0-2.0)	1.0 (1.0-2.0)	1.0 (1.0-2.0)
12-16	3.0 (3.0-3.0)	2.5 (2.0-3.0)	2.0 (1.0-3.0)
17-21	4.0 (4.0-4.0)	3.0 (3.0-5.0)	3.0 (2.0-3.0)
Duration (mins) of weekly practice sessions			
7-11	90.0 (60.0-120.0)	90.0 (90.0-90.0)	90.0 (60.0-97.5)
12-16	105.0 (90.0-120.0)	112.5 (90.0-120.0)	90.0 (90.0-120.0)
17-21	90.0 (90.0-120.0)	120.0 (90.0-120.0)	120.0 (90.0 -120.0)

(70%). Nutrition support was provided by the majority of WSL (71%) and WC (75%) clubs compared to a minority of WNL clubs (20%), and psychological support was largely provided in WSL (71%) over WC (25%) and WNL (40%) clubs. Data on player attributes were also collected by clubs during development. Physical data (e.g., speed endurance, body composition) were collected by most clubs (80%), and skill data (e.g., technical, tactical) by the majority (72%). Yet, psychological (e.g., motivation, self-regulation) and sociological data (e.g., background, education) were collected by only 40%. Despite these areas having distinct predictors of talent (e.g., grit; Larkin et al., 2015; 2023), they have received less attention in soccer talent literature which may influence practice trends (Williams et al., 2020). A minority of clubs (8%) did not collect any data.

Together with talent development processes, clubs supported the dual-careers of players aged 17-21 years through partnerships with the Talented Athlete Scholarship

Scheme (TASS) or universities in the U.K., with varying degrees of provision across tiers. These collaborations support talented players in balancing professional sport with education, occupation, or professional development to maximise potential, and hold particular importance for female players given the prevalent challenges in financial security and career development despite the professionalisation of soccer (McCormack & Walseth, 2013; Harrison et al., 2020). In pursuing dual-careers, players face demands such as role strain, identity, and balancing soccer with education commitments, which can ultimately lead to dropout (Gledhill & Harwood, 2015; Harrison et al., 2020; McGreary et al., 2021; Simpson et al., 2022). In the present study, most WSL clubs were supported by TASS or partnered with a U.K. university (71%), compared to half of WC (50%) and less than a third of WNL clubs (20-30%). Whilst provision increased as a function of tier, less than half of clubs offered it. Further club provisions included dual-registration (i.e., playing for another team in a different league for additional development opportunities), provided by all clubs as required by The FA (2024). Residency programmes were present in approximately half of WSL (43%) and a minority of WNL clubs (20%), and transportation services were available for most WSL (86%) and half of WNL clubs (50%). No WC clubs reported the provision of a residency programme or transportation services. While such services are customary within male youth soccer environments (Mills et al., 2014; Ford et al., 2020b), they appear to be less common in female youth soccer, particularly in lower tiers. For staff involved with player recruitment and development, most clubs (88%) provided development opportunities to coaches and approximately a third for recruitment staff (31%). Total, age-specific and gender-specific experience, club knowledge and philosophy, and formal coaching qualifications were all perceived as important attributes, yet previous playing experience was not valued.

Homegrown players are defined as those that have been registered within the youth structure of their club for at least three years and have progressed to make a first-team appearance (The FA, 2022). WSL clubs developed more homegrown players (*med* = 2, *IQR*, 1-2) per season (since 2018) than WC (*med* = 1, *IQR*, 1-2) and WNL (*med* = 1, *IQR*, 0-5) clubs. The more multifaceted talent development processes within WSL clubs may contribute toward these higher homegrown player counts compared to lower tiers. This is consistent with previous research, which indicated that the number of hours accumulated in academy practice sessions is a key factor in determining which players progress to WSL status, as opposed to those that do not advance beyond the academy level (Andrew et al., 2024). Despite this, clubs across all league tiers continue to face significant challenges in generating homegrown players for their senior teams. The current homegrown player quota requires WSL clubs to field 8 players, and WC clubs to field 15, yet many struggle to meet these requirements. The primary challenges faced in player development were financial constraints (84%) and competition from other clubs (76%). WC and WNL clubs faced similar challenges, and more frequently so, than WSL clubs. For instance, lower staff numbers (48%) and working hours (44%) were more prevalent in WC and WNL structures. Similarly, financial constraints affected all WC and most WNL (90%) academies, which can hinder the development of players (Andrew et al., 2021). In contrast, competition from other clubs was the primary challenge reported by WSL clubs (71%). Therefore, the lesser financial and resource limitations in WSL clubs may also partially explain their higher homegrown player counts. However, it is important to note that a range of factors may influence player development and progression to senior level. Large inter-individual variability may exist in player pathways (Hendry et al., 2019; Ford et al., 2020; Andrew et al., 2024), therefore it cannot be ascertained

that provision of more multifaceted processes were solely responsible for higher homegrown player counts, highlighting the complexities of talent identification and development in soccer.

The median number of registered players in WSL (112, *IQR*, 75-144) and WC (111, *IQR*, 77-140) clubs were similar, and slightly higher than in WNL clubs (100, *IQR*, 90-108), due to registering approximately twice as many players aged 7-11 years (see **Table 3.4**). Clubs had a median of 34 registered players in the Foundation Development Phase (7-11 years), 53 in the Youth Development Phase (12-16 years), and 23 in the Professional Development Phase (17-21 years), which is notably fewer players than male academies (8-11 years = 80, 12-16 years = 100, 17-21 years = 66; Ford et al., 2020b). WSL clubs recruited (*med* = 19, *IQR*, 16-37) and lost (*med* = 14, *IQR*, 9-19) the fewest players during the most recent full season, leading to the lowest player turnover rate of 22%. The annual player turnover rate for all clubs was 39%, exceeding that of male soccer (25-30%; Ford et al., 2020b; Güllich, 2014). However, the turnover rate is likely associated with a larger player intake rather than losses. Recent structural changes to the youth pathway may have expedited the expansion of youth structures and training provisions within clubs, allowing more players to enter the system annually. For example, since the reformation of high-quality practice environments hosted by clubs and organisations for players aged 8-16 years in 2022, the number of registered players has increased by 87% in 2023 (The FA, 2023a). Like male youth soccer, player turnover was highest at the youngest age category, typical for clubs forming initial age group squads (Ford et al., 2020b).

3.5.4 Loss of players/deselection

Over the course of development, the two primary reasons for players leaving the

Table 3.4 Descriptive statistics for responses on registered players and player turnover at WSL, WC, and WNL league tiers.

	WSL	WC	WNL
Median (IQR) no. of registered players			
7-11	40 (23-60)	43 (40-60)	20 (18-30)
12-16	60 (45-65)	52 (48-78)	57 (50-60)
17-21	24 (22-25)	23 (18-25)	25 (18-40)
All Age Categories	112 (75-144)	111 (77-140)	100 (90-108)
Median (IQR) no. of players recruited (last full season)			
7-11	19 (2-22)	40 (30-60)	19 (18-20)
12-16	10 (5-14)	26 (17-40)	40 (20-55)
17-21	7 (4-15)	13 (6-24)	8 (7-29)
All Age Categories	19 (16-37)	84 (49-100)	67 (40-87)
Median (IQR) no. of players lost/dismissed (last full season)			
7-11	4 (0-5)	8 (3-10)	4 (0-5)
12-16	8 (2-12)	9 (6-20)	14 (5-20)
17-21	8 (5-10)	5 (2-10)	5 (4-16)
All Age Categories	14 (9-19)	19 (11-37)	22 (8-31)
Player turnover rate (last full season)			
7-11	21%	61%	66%
12-16	15%	32%	46%
17-21	37%	53%	54%
All Age Categories	22%	52%	55%

pathway were player-initiated departures (player decided to leave the club; n = 24) or club-initiated releases (club decided to dismiss the player; n = 20). Free text responses indicated that the most frequently cited reason for player-initiated departures was transferring to other clubs (n = 8), which was more prominent in the lower tiers, and appears to be a universal challenge regardless of gender or tier (Reeves et al., 2018;

Ford et al., 2020b). Despite club-university partnerships, players still departed to pursue higher education opportunities, such as university in the U.K. or collegiate scholarships in the United States (U.S.), which are desirable due to their significant investment in supporting student-athletes (Markovits & Hellerman, 2003). Youth players from England purposely plan to attend university to develop their dual-careers and thus clubs are continually challenged to retain players within England, in addition to supporting dual-career aspirations (Harrison et al., 2020). Increasing the quantity and quality of club-university partnerships may help retain players, widen the talent pool, and appropriately support dual-career ambitions (Gledhill & Harwood, 2015). Consistent with previous research, female youth players withdrew from soccer due to challenges in balancing other commitments with soccer, such as their private life, part-time employment, studies, or other sports (Gledhill & Harwood, 2015). Travel demands also contributed to the loss of players, highlighting accessibility issues around the nation for both players and parents.

Free text responses also outlined that the salient reason for club-initiated releases was due to players not possessing the skills required to meet the demands of the game (n = 8; Williams & Reilly, 2000). Deselection based on performance quality poses a risk of diminishing both the size and quality of the talent pool (Dugdale et al., 2021). Physical data, which were frequently collected, can often influence (de)selection decisions, yet their longer-term predictive value is less certain (Vaeyens et al., 2006; Figueiredo et al., 2009; Coelho-e-Silva et al., 2010; Deprez et al., 2015). Later born and maturing players with less pronounced physical attributes may compensate in other areas (i.e., technical, tactical), eventually resulting in broader performance profiles and a greater likelihood of progressing to professional status (Bennett et al., 2019; Kelly et al., 2020). Equally, club staff should be aware that

growth and maturation can disrupt technical and tactical skills and should be cautious of deselecting players based solely on physical performance quality (Radnor et al., 2023). This is important for female players, as they experience natural post-pubescent increases in fat mass that may temporarily affect their motor skill development (Lloyd & Oliver, 2012). Furthermore, filtering from a single (e.g., U14s = 13-14 years) to a dual band age group (e.g., U16s = 14-16 years) impelled clubs to release players to ensure squad sizes comply with regulations. Therefore, governing bodies and clubs may consider reviewing their current youth structures to help increase the talent pool size to align with the growth of the female game. In developing systems, broadening the talent pool by facilitating access to high quality coaching environments has been recommended to reduce deselection and dropout rates (Bennett et al., 2019). WSL clubs reported provision of a high level of support (*med* = 4, *IQR*, 3-4) to deselected players, compared to a moderate level in WC (*med* = 3, *IQR*, 2-3) and WNL clubs (*med* = 3, *IQR*, 3-4). Exit pathway processes were frequently employed but varied between clubs, generally including a combination of initial meetings with players and parents regarding the rationale for deselection, performance plan reviews, feedback, and assessment of exit options. Parts of these processes, such as the communication of rationale and feedback, have been previously documented in female youth sport (Neely et al., 2016), however clubs took additional steps by assisting players in securing alternative opportunities either inside (i.e., aiding reselection) or outside (e.g., education) of soccer. Notably, there was limited psychological and wellbeing support for deselected players, despite evidence of the distress that can be induced by the process, such as anxiety, depression, humiliation, and identity disruption (Brown & Potrac, 2009; Blakelock et al., 2016; 2019; Neely et al., 2017; Wilkinson, 2021). Offering or allocating psychological support to players is vital for enhancing transition

quality and ensuring players are equipped to effectively cope with deselection (Williams & MacNamara, 2020).

3.5.5 Implications, limitations and future research directions

The survey data presented provides valuable insights that can serve as a benchmark for the current landscape of talent identification and development within female soccer academies in England. These findings hold significant implications for stakeholders across the sport, particularly in providing: (1) an understanding of the current state of youth structures; (2) identification of key areas requiring investment and development; and (3) a reference point for assessing the success and progress of changes implemented in recent years. Additionally, this approach could be adopted by other soccer nations to understand, assess and refine their own talent pathways and youth structures (Bennett et al., 2019).

Furthermore, the data highlights the expansion of youth structures, aligning with the broader growth of female soccer in England. This development may have encouraged the recent inauguration of female teams and talent pathways in some well-established men's soccer clubs. These clubs may currently be operating within the lower tiers of the pyramid and could have more refined processes and investment capabilities that possibly surpass those of their competitors within the same tier, or even some clubs in higher tiers, in their efforts to climb the soccer pyramid. Therefore, reinvestigation post-stabilisation of the soccer pyramid would offer valuable insights into the evolving landscape.

The survey provided valuable insights into an under-researched area, using a representative sample of 54% of clubs from the highest three tiers across England. Despite its contributions, this study has some limitations. One key limitation is the

reliance on self-reported data from academy directors, which may introduce bias, as respondents could unintentionally or intentionally filter the information they provide. Thus, it is difficult to ascertain whether the responses accurately reflect the factual acting of the academy, rather than the viewpoint of the respondent. Additionally, some responses may align with perceived best practices or expectations, making the data potentially vulnerable to social desirability bias. To mitigate these limitations, future research could benefit from triangulating data sources by incorporating direct interviews, observations, or other methods to provide a more comprehensive perspective of these practices.

Further research is needed to explore how clubs define and evaluate talent identification and development objectives across different stages of development, to account for potential overlaps in objectives and to specifically identify how they shift as players progress through age categories. Moreover, future studies could explore the elements and phases of the talent identification and development process that were not investigated within the present research but could provide a broader understanding of the talent pathway, such as initial participation, detection of talent from other sports, and selection processes (Williams et al., 2020). Finally, this study provides a descriptive account of talent identification and development processes within female soccer academies. As such, it does not evaluate the effectiveness of these processes in progressing players into senior squads, enhancing their performance, or improving their overall wellbeing (Ford et al., 2020b). To address this, future research should evaluate the impact of these academy characteristics on later senior success. This could involve analysis of individual factors, such as specific development strategies or support structures, or by exploring the interplay between various factors on player outcomes.

3.6 Chapter Summary

This study examined talent identification and development processes within the youth structures of female soccer academies in England. Higher-tier clubs exhibited a greater number of specialised departments, increased training provision, lower player turnover, enhanced support for deselected players, and lesser financial constraints. There was an increasing focus on recruiting and developing players for the senior team at older ages, however clubs prioritised the personal development of all players. Players typically departed for other clubs or to pursue higher education, or they were deselected due to not possessing the skills required by clubs, and due to current talent pathway structure issues. Talent identification processes may currently be hindered by a lack of specialised recruitment personnel or dedicated departments. The integration of specialised staff such as scouts, psychologists, and nutritionists can potentially refine these processes, yet financial constraints may pose a significant barrier to their implementation and advancement. This underscores the challenge for clubs to navigate resource limitations while striving to optimise player development pathways for the future of female youth soccer in England.

In sum, Chapter Three lays a solid foundation for deeper investigations into specific talent identification, development and deselection processes within female soccer academies. However, it does not account for player experiences and pathways both before or after academy entry. Chapter Four will address this gap by exploring the soccer engagement profiles of youth players currently navigating the female talent pathway in England.

4 Talent development in female soccer: Activities and perceptions of youth players from England

4.1 Chapter Overview

The previous chapter provided a comprehensive overview of the structure of female soccer academies and the talent identification and development processes implemented within them across the highest three league tiers in England. Building on this foundation, Chapter Four examines the experiences of players progressing through these structures by quantifying key soccer milestones and engagement patterns. As highlighted by a review of existing literature in Chapter One, previous research has primarily investigated this topic retrospectively using samples of professional adult players, resulting in outdated descriptions of player journeys through talent pathways. Chapter Four addresses this limitation by focusing on current youth players to minimise retrospective recall bias and to offer a contemporary and context-specific understanding of the player journey through the female talent pathway in England.

4.2 Abstract

Over the past decade, exponential growth of female soccer in England has driven significant changes to youth talent pathways, and underlined the need for clubs to enhance their talent development systems. While the pathways of male players are well-documented, research on female players, particularly at youth level, remains limited. The present study explored the developmental activities and perceptions of 34 female youth soccer players from academies of clubs in the WSL. Using the Participation History Questionnaire (PHQ), the study captured data on key developmental soccer milestones, engagement in soccer-specific activities,

involvement in additional sports, and perceptions of enjoyment, motivation, physical challenge, and cognitive challenge during childhood and adolescence. Players began soccer engagement early in childhood (5.8 ± 1.5 years) and entered academies during late childhood (10.1 ± 2.5 years), at an earlier age than current professionals (Andrew et al., 2024a). Prior to academy entry, players primarily engaged in play activities, while coach-led practice and competition activities became increasingly more prominent during adolescence as play decreased. Enjoyment was consistently high, and motivation remained moderate to high across all activities throughout development. Perceived physical and cognitive challenge increased from childhood to adolescence, with competition identified as the most challenging activity. Findings are most consistent with the early engagement developmental pathway towards expert performance, with some evidence for diversified sporting experiences. This study underscores the importance of contemporary examinations of developmental activity profiles to reliably inform the evolving landscape of the female game.

4.3 Introduction

Soccer remains the top participation sport for women and girls in England, with participation rates, attendance figures (live and television), social media following, and access to playing opportunities at all levels increasing annually (The FA, 2023a). At youth level, clubs continue to expand their talent development structures, allowing more players to access an organised programme of support consisting of soccer-specific activities (i.e. training, match play) to facilitate player progression towards senior level (Chapter Two). In conjunction with the structural growth of female soccer, there has also been an increase in research attention that underpins talent development

with the aim to optimise the development of talented youth players into expert performers (Okholm Kryger et al., 2021). However, there also remains a paucity of scientific knowledge in comparison to male youth soccer, leading to calls for greater representation (Baker et al., 2020; Gledhill et al., 2017; Okholm Kryger et al., 2021; Williams et al., 2020). For example, an individual's talent development trajectory is shaped by various personal and environmental factors (Coutinho et al., 2016; Williams et al., 2020), although research in female youth soccer has largely been limited to physical (e.g., Datson et al., 2020; Emmonds et al., 2018) and psycho-social (e.g., Gledhill & Harwood, 2014; 2015; McGreary et al., 2021) aspects. Another factor thought to influence player development is the quantity and type of activities engaged in throughout childhood and adolescence, which can change substantially from first engagement through to expert performance (Ericsson & Harwell, 2019; Ford & Williams, 2023).

Research exploring developmental activities stems from two primary frameworks that have laid the foundations for understanding potential development requisites underpinning expert performance. Firstly, the Deliberate Practice Theory (Ericsson et al., 1993) emphasises that engagement in deliberate practice (defined as individualised training supervised by a knowledgeable coach, with immediate opportunities for feedback and corrective guidance) is central to expertise attainment (Ericsson, 2013; Ericsson & Harwell, 2019; Ericsson et al., 1993). The theory describes a monotonic relationship between performance and accumulated hours in deliberate practice over time, inferring that participation in domain-specific deliberate practice should be maximised (Baker et al., 2003). Therefore, the framework advocates an early specialisation pathway towards expert performance, via participation in a single sport from early childhood to maximise deliberate practice

opportunities in that sport (Côté et al., 2009; Haugaasen & Jordet, 2012). Secondly, the Developmental Model of Sport Participation (DMSP) was later posited, and offered multiple sport-specific developmental pathways towards expert performance (Côté et al., 2007; 2009). Alongside early specialisation, the DMSP also accounts for early diversification, involving the sampling of a variety of sports, and engagement in deliberate play (i.e., intrinsically motivating peer-led play activities, specifically designed to maximise enjoyment) from an early age (Côté, 1999; Côté et al., 2003; 2007; 2009). The model postulates that early diversification develops transferable mental, physical, social, and personal skills needed to specialise (~age 13-15 years) and invest (~age 16 years or older) in a primary sport during adolescence, leading to lengthier sporting careers (Côté et al., 2009; Coutinho et al., 2016; Davids et al., 2017). Diversification has long been advocated due to apparent risks of specialisation, such as overuse injuries, burnout, and attrition (Bell et al., 2018; Fraser-Thomas et al., 2008; Strachan et al., 2009), yet reconsideration of the early specialisation pathway may be merited due to prevalent limitations of existing work, and gaps in knowledge (Baker et al., 2021; Mosher et al., 2020). Accordingly, the early engagement developmental pathway (Ford et al., 2009) was introduced to balance sampling with ample engagement in domain-specific play and practice, from initial entry into the sport later specialised and invested in (Hendry & Hodges, 2018; 2019). It also recognised that childhood engagement patterns are individualised, and that specialisation and diversification pathways are not strictly dichotomous (Güllich et al., 2022) but are instead thought to exist on a continuum with a broad and complex range of possibilities and trajectories (Ford & Williams, 2017; Sieghartsleitner et al., 2018). This refined understanding acknowledges the complexity and variability of developmental sport engagement.

The developmental pathways and activities of male soccer players have received significant research interest (Andrew, et al., 2021a; Ford et al., 2009; 2012; Ford & Williams, 2012; Hendry et al., 2014; 2019b; Hendry & Hodges, 2018; Hornig et al., 2016; Roca et al., 2012), and reviews on this area have been largely male-focused (Haugaasen & Jordet, 2012). Whereas, retrospective enquiry on female soccer players is growing, but remains largely limited to professional adult players (Andrew et al., 2024a; Ford et al., 2020a; Güllich, 2019; Hendry et al., 2019a). Ford et al. (2020a) reported that female international players from multiple high performing nations engaged in soccer activities early in childhood (~age 5 years), joined an academy during late childhood (~age 14 years), and accumulated more hours in soccer-specific activities than in other sports. Engagement in soccer practice continually increased through to late adolescence, while engagement in soccer play activities and other sports declined. A study on adult German players by Güllich (2019) indicated that national team players accumulated less hours in coach-led soccer practice compared to first division players, but more in soccer play activities and coach-led practice in other sports. Players engaged in other sports to a lesser degree than in soccer activities. Moreover, Hendry et al. (2019a) detected an earlier initial engagement age in soccer activities and an earlier entry into an academy for varsity compared to national level Canadian female soccer players. A higher amount of peer-led soccer play differentiated national from varsity players, but engagement in other sports was minimal, indicating the importance of domain-specificity over diversification for developing expertise in female soccer. In our recent study of professional soccer players from England, a later start age (~age 6 years) but earlier entry into an academy (~age 12) were observed in comparison to previous studies (Ford et al., 2020a; Hendry et al., 2019a). Professional players engaged in higher

amounts of soccer practice and play during childhood, and more practice in adolescence, than players who did not attain professional status (Andrew et al., 2024a).

Collectively, these studies suggest that professional female players began engagement in soccer early in childhood, and accumulated more hours in soccer-specific activities than in other sports, therefore indicating signs of an early engagement developmental pathway with some diversification into other sports (Ford & Williams, 2023). However, interindividual variations in soccer engagement patterns based on nationality and skill level were evident within these studies. These variations may stem from differences in talent development systems between nations (Ford & Williams, 2017), including factors such as sport popularity, talent pool size, financial resources, quality of facilities and coaching, organisational structure (Bennett et al., 2019), and culture (DeCouto et al., 2020). Nation-specific investigations could offer valuable insights for national governing bodies and clubs to refine their development programmes (Andrew et al., 2024a).

Despite growing interest in the quantity of developmental activities engaged in by players, the quality of such activities has largely been overlooked, which could also be important for facilitating progression towards expert performance, creating effective learning environments, and explaining variability in performance improvements that go beyond the time spent in a task (Coutinho et al., 2016; Gledhill et al., 2017). Hendry et al. (2019a) argued that not all practice or play experiences are equal in quality, as they can be influenced by task demands, the level of player engagement, and the extent to which players' perceptual, cognitive and motor skills are challenged. For example, athletes with access to higher quality coaching and training can outperform those who have accumulated a higher quantity of practice hours (DeCouto et al., 2020), therefore quality experiences can be as important as

engagement quantities. Hendry et al. (2019a) evaluated the quality of developmental activities using the challenge point framework (CPF) to measure perceptions of challenge (Guadagnoli & Lee, 2004; Hodges & Lohse, 2022). The CPF suggests that optimal learning occurs when task difficulty matches or slightly exceeds the learner's skill level relative to the task. Within this zone, the learner can process sufficient information to maximise potential perceptual, cognitive and motor learning benefits. Hendry et al. (2019a) used engagement in moderately to highly challenging activities as an estimation of quality, which appeared to predict career attainment, though only a single item rating of challenge was used. Further, Andrew et al. (2024a) revealed differences in physical and cognitive challenge in practice and competition between ex-academy and professional players from England during adolescence, which may have affected progression, further supporting the efficacy of evaluating the quality of developmental activities. Similarly, enjoyment and motivation may affect the quality of engagement. In accordance with self-determination theory (Ryan & Deci, 2000), engagement in childhood play activities indicates inherent interest and enjoyment in the sport from an early age, and could predict long-term engagement by facilitating the intrinsic motivation needed for endurance through more externally controlled activities such as practice (Côté et al., 2007; Hendry & Hodges, 2019). Therefore, levels of enjoyment and motivation may provide an indication of intentions behind engagement in different types of activities. Tracking the changes and interactions between important development variables (i.e., motivation, enjoyment, types of challenge) in various activity types across development may have implications for practitioners developing talented players. This could include practice designs and development programmes, that not only improve skill, but also foster long-term participation and satisfaction (Baker et al., 2020; Hendry et al., 2019a).

Despite the extensive knowledge base in male soccer, application of evidence from the male to female game is challenging and potentially erroneous in nature, due to a range of biological and contextual differences (Emmonds et al., 2019). For example, due to maturational and hormonal differences between boys and girls (Lloyd & Oliver, 2012), replicating the demands of practice activities placed on male soccer players with female players may increase injury risk. Given female players are more susceptible to ACL injuries in comparison to male players (Gupta et al., 2020), the need to consider the developmental activities of female players in isolation and potentially adjust or create tailored development frameworks is emphasised (Lima et al., 2020). However, to date, no studies have directly investigated the developmental activities of current female youth soccer players, highlighting the current gender data gap in talent development research (Curran et al., 2019; Peters et al., 2022). While qualitative research by Gledhill and Harwood (2014) emphasised the importance of unsupervised peer-led play experiences and early access to competition for initial engagement and development in soccer for female players, this was not a primary focus of the study. Existing studies on female players have focused on professional samples, which offers little insight to policy makers on the current developmental landscape and youth systems (Baker et al., 2020). Current academy players have experienced different demands and opportunities compared to senior players assessed in these studies (Andrew et al., 2024a; Ford et al., 2020a; Güllich, 2019; Hendry et al., 2019a). For example, current youth players have directly observed and participated in a phase of exponential growth and through the transition of professionalising the female game. In the last decade, the English FA has updated their mixed-gender policy (age limit raised to 18 in 2015) and made changes to talent development pathways (i.e., creation of the FAWSL Academy League in 2018, The FA Lionesses Talent

Pathway in 2020). Given these changes, and the retrospective nature of existing studies, which typically involved players aged 23 to 29 years, our understanding of developmental activities undertaken by female players may be outdated by close to a decade. Therefore, exploring the engagement histories of existing academy players is necessary to capture the evolving developmental landscape (Andrew et al., 2024a).

The aim of the present study was to explore the quantity of engagement in developmental activities of current female academy soccer players from England. A secondary aim was to examine the quality of activities engaged in, by acquiring perceptions of physical and cognitive challenge, enjoyment, and motivation of each activity throughout development. As opportunities for soccer engagement continue to grow with the development of the female game in England, it is anticipated that youth players will exhibit greater specialisation than diversification compared to current professionals (Andrew et al., 2024a). Players are also expected to demonstrate early engagement in soccer, since this pathway is more prominent in popular and technically demanding sports with high participation rates (Ford & Williams, 2017), and has been evidenced in previous female soccer studies (Andrew et al., 2024a; Ford et al., 2020a; Güllich, 2019; Hendry et al., 2019a). However, it is important to note that there is no guarantee that all youth players in the study will progress to professional senior status; some will inevitably face deselection or may dropout. Consequently, the quantity of time spent within soccer-specific activities is expected to be lower than that reported for professional players.

4.4 Methodology

4.4.1 Participants

Participants were 34 female academy soccer players from England. Players were recruited from the academies of two clubs from the highest league tier in England (WSL). At the time of data collection, players were aged 16.5 ± 1.5 years and their mean playing experience in soccer was 10.7 ± 2.2 years. Contact was initially made with the academy director of each club via email correspondence by a member of the research team. Upon agreement, a suitable date, time, and location was set for data collection. All data were collected during the 2021/22 and 2024/25 seasons. No member of the research team had directly worked with any of the participants at the time of data collection or held a position at the club involved. Participants provided written informed consent prior to data collection, and all aspects of the research design and procedure were conducted in accordance with the Declaration of Helsinki (2013) and approved by the ethical committee of the institution (19/SPS/012).

4.4.2 Questionnaire

An adapted version of the Participation History Questionnaire (PHQ) was distributed to participants to collect retrospective data on key soccer milestones, and developmental activities of each player in soccer and other sports (Ford et al., 2010b). The PHQ emerged as a prevalent method of accumulating data on athlete engagement in developmental activities, and has been employed in a variety of sports and contexts such as cricket (Ford et al., 2010b), rugby-league (Andrew et al., 2021b), male soccer (Andrew et al., 2021a; Ford & Williams, 2012; Hendry & Hodges, 2018; Ward et al., 2007; Williams et al., 2012) and more recently in female soccer (Andrew et al., 2024a; Ford et al., 2020a; Hendry et al., 2019a). An examination of the reliability (intraclass correlation coefficient (ICC) = 0.87) and validity (ICC = 0.76) of the PHQ for providing estimates of athlete engagement in developmental activities has been

presented by Ford et al. (2010b). On account of such psychometric properties, and its continued use within soccer, the PHQ is an appropriate measure to investigate the development pathways of athletes.

The PHQ included three sections. The first section aimed to identify key milestones in players' soccer journeys. These involved the age players first engaged in soccer, start ages in supervised practice, competition, and strength training, as well as recruitment into a talent development programme (i.e., academy). Additionally, the age that players made their first international youth and senior appearances (where applicable) and their first senior club appearance (where applicable) were elicited.

The second section focused on understanding player engagement in various soccer-related activities throughout their development. Drawing on previous research (Ford et al., 2010b) and recommendations (Côté et al., 2005), players were asked to estimate the hours spent in four distinct soccer activities: coach-led practice (structured group practice supervised by coaches, with the intention of performance improvement, e.g., team practice sessions); individual practice (purposeful solitary practice aimed at performance improvement, e.g., solo shooting practice); peer-led play (informal play-type games with peers, emphasising fun and enjoyment, e.g., soccer games with friends); and competition (organised competition supervised by adults, with a focus on winning, e.g., league games). Participants were required to give estimates of their soccer activity for a typical week within specified age group categories throughout their development. These categories ranged from Under 6 (U-6) to U-18 age groups and were measured in 2-year intervals (i.e., 5-6 yrs (U-6), 7-8 (U-8), up to 17-18 (U-18)). In England, age group categorisation is determined by a cut-off date of September 1st (Kelly et al., 2023) – identical to the education system. Estimates were recorded in reverse chronological order to obviate overestimations

associated with starting at the earliest age category. For each age category, the components measured included: predominant gender of the team, average duration of each session (hours per week), and months per year participating. Any absence from soccer activities due to injuries were recorded for each age category and subtracted from engagement estimates. From these estimates, mean accumulated hours in soccer-specific activities were calculated for childhood (5-12 yrs) and adolescence (13-18 yrs). Participants were also asked to record their perceptions of the level of enjoyment, motivation, physical challenge, and cognitive challenge associated with each soccer and other sport activity across their development, relative to their own skill level at that distinct development phase. Enjoyment referred to the level of inherent joy/pleasure gained from engaging in an activity, and motivation related to the eagerness to persist in an activity (Ericsson et al., 1993). Challenge related to the association between the players' physical/cognitive ability and the difficulty of the activity relative to their skill level (Hendry et al., 2019a). Perceptions were provided via a 5-point Likert scale (1 = very low level; 2 = low level; 3 = moderate level; 4 = high level; 5 = very high level). Optimal challenge was operationally defined as moderate to high levels of challenge – a level associated with demanding and stimulating activities that continually challenge abilities and promote learning (Hendry et al., 2019a).

The third section of the PHQ explored engagement in sports outside of soccer across development. Engagement in sports during physical education lessons and in external sports (those outside of physical education) were recorded. The purpose of clearly distinguishing between activities inside and outside of physical education was to aid participant recall, to focus on external sport engagement in more detail, and to prevent physical education data from confounding external sport data. To assess

engagement in physical education, participants were provided with a list of popular sports typically engaged in during lessons (e.g., athletics, swimming) and were required to determine those they had engaged in, and to specify engagement in any additional sports that were not listed. Assessment of external sports was conducted in a similar format to the second section of the PHQ. Estimates of hours per week and months per year in external sports were required for coach-led practice, individual practice, peer-led play, and competition activities. External sport participation was operationalised as regular participation for at least one month (Peters et al., 2022).

4.4.3 Procedure

Face-to-face administration of the questionnaires was selected instead of online distribution to facilitate participant understanding and to allow for provision of immediate feedback on the research purpose and procedure. A member of the research team briefed participants on the study's purpose and provided verbal instructions for completion of each section of the questionnaire, including an explanation of all operational definitions of activity types and perception measures. Players completed the questionnaire together in a quiet room at the academy and were given approximately 60 minutes to answer all sections. Two members of the research team familiar with the procedure were present throughout to assist as needed.

4.4.4 Data analysis

Developmental milestone data were reported as mean and standard deviation (*SD*) values for the age each milestone was first reached. For soccer-specific engagement, the hours accumulated in coach-led practice, individual practice, peer-led play and match play were calculated for childhood (6-12 years) and adolescence (13-18 years).

Since data were measured biennially, linear interpolation methods were used to provide estimates of engagement in intervening years (average of the preceding and succeeding years). For perceptions data, means and *SD*s were calculated for four developmental variables (enjoyment, motivation, physical challenge, and cognitive challenge). To identify differences in engagement and perceptions within each age period (childhood and adolescence), ten separate within-subjects ANOVAs were conducted, with Bonferroni *post hoc* pairwise comparisons. To determine changes in engagement and perceptions across development, within-subjects *t*-tests were conducted to compare these variables between childhood and adolescence. Any sphericity violations were adjusted using Greenhouse-Geisser df corrections and the alpha level for significance was set at $p < 0.05$. Proportions of players engaging in each soccer-specific activity were reported as frequencies. For data concerning other sports, the types of external sports engaged in were presented alongside the number of players engaging within them during development. Engagement within other sports was calculated and presented as descriptive statistics (mean and *SD*s).

4.5 Results

4.5.1 Soccer milestones

Table 4.1 presents the average age at which academy players reached key soccer-specific milestones. All 34 players started playing soccer during childhood, at an average age of 5.8 ± 1.5 years. The average age that players joined an academy was 10.1 ± 2.5 years. At the time of data collection, 12 players had made their first youth international appearance (aged 14.7 ± 1.4 years), and 2 had made their first appearance

for their senior domestic team, both aged 17 years. No players had yet made their first senior international appearance.

4.5.2 Soccer engagement

Figure 4.1 and **Table 4.2** display the mean hours accumulated in the four soccer-specific activities across player development. Academy players accumulated 5,614 ± 490 hours in soccer-specific activities across their development. Throughout childhood (6-12 years), players accumulated an average of 2,581 ± 341 hours across all soccer activities. There were significant differences in engagement between activities during childhood ($F_{1.68, 41.88} = 12.61$, $p < 0.001$). *Post hoc* analysis with a Bonferroni adjustment revealed that hours accumulated in coach-led practice were significantly higher than in individual practice and competition (p's < 0.001), and hours accumulated in peer-led play were also significantly higher than in competition ($p = 0.008$). All players participated in coach-led practice and competition during childhood, while 85% participated in individual practice, and 79% in peer-led play activities. Throughout their childhood, 47% of players reported engagement in mixed-gender soccer teams, starting from age 6 years. During adolescence (13-18 years), players accumulated an average of 3,033 ± 352 hours across all soccer-specific activities. There were significant differences between activities engaged in across adolescence ($F_{1.68, 41.88} = 12.61$, $p < 0.001$). Hours accumulated in coach-led practice were significantly higher than individual practice, peer-led play and competition (p's < 0.001). All players engaged in coach-led practice, individual practice and competition activities in adolescence, and 79% of players engaged in peer-led play activities. Only one player reported engagement within mixed-gender soccer teams during adolescence (until age 13-14 years), with 97% engaging in female-only soccer.

Table 4.1 Mean (and *SD*s) age in years for soccer milestones achieved by current academy players.

Start Age in Soccer	Start Age in Practice	Start Age in Competition	Start Age in Academy	Start Age in Strength Training
5.82 ± 1.51	6.55 ± 1.62	7.52 ± 1.97	10.06 ± 2.52	12.81 ± 1.87

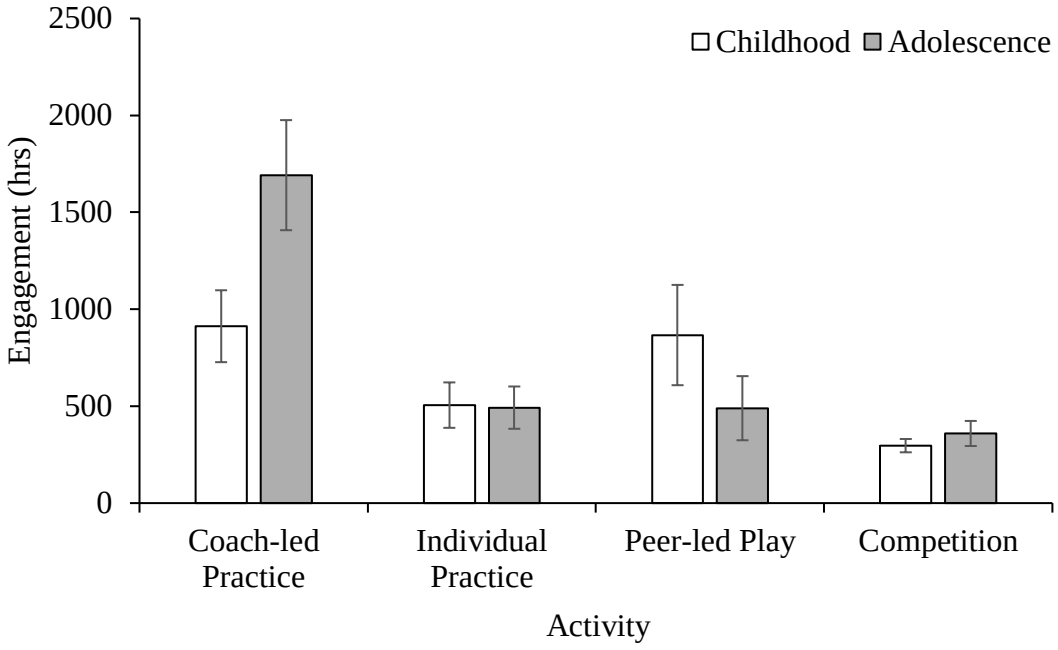

Figure 4.1 Mean hours accumulated (and *SD* bars) in childhood (6-12 years) and adolescence (13-18 years) for each developmental soccer activity.

Table 4.2 Mean (and *SD*s) accumulated hours in developmental soccer activities across childhood (6-12 years) and adolescence (13-18 years).

	Childhood	**Adolescence**	**Overall**
Coach-led Practice	912.57 ± 185.46	1,691.77 ± 283.95	2,604.34 ± 339.16
Individual Practice	505.53 ± 117.16	492.49 ± 109.08	998.03 ± 160.08
Peer-led Play	866.88 ± 258.70	489.63 ± 165.35	1,356.51 ± 307.03
Competition	296.33 ± 34.35	359.16 ± 64.62	655.49 ± 73.18
Total	2,581.31 ± 340.92	3,033.06 ± 352.20	5,614.37 ± 490.18

There were also significant engagement differences in activities between childhood and adolescence. Within-subjects *t*-tests revealed that engagement in coach-led practice ($t_{31} = 5.01$, $p < 0.001$) and competition ($t_{31} = 2.68$, $p = 0.012$) activities were significantly higher in adolescence compared to childhood. Whereas, hours accumulated in play activities were significantly higher ($t_{24} = 2.42$, $p = 0.024$) in childhood compared to adolescence.

4.5.3 Soccer perceptions

Mean ratings (and *SD*s) for perceptions of enjoyment, motivation, physical challenge, and cognitive challenge across childhood and adolescence are presented in **Table 4.3**. Enjoyment levels across all soccer-specific activities were perceived as high to very high, with no significant differences between ratings in childhood and adolescence. During childhood, there were no significant differences in enjoyment between activities (p's > 0.05), however there were statistically significant differences in adolescence ($F_{2.96, 77.03} = 9.01$, $p < 0.001$), with enjoyment in individual practice rated significantly lower than in coach-led practice, peer-led play and competition (p's < 0.05). Motivation levels in soccer-specific activities were generally perceived as moderate to high across player development. There were no significant differences in motivation levels between activities in childhood (p's > 0.05). However, motivation levels between some activities were significantly different in adolescence ($F_{1.83, 47.58} = 10.66$, $p < 0.001$). *Post hoc* analyses revealed that motivation ratings of both coach-led practice and competition were significantly higher than individual practice and peer-led play (p's < 0.05). Within-subjects *t*-tests also revealed that coach-led practice activities were significantly more motivating in adolescence compared to childhood ($t_{32} = 2.46$, $p = 0.019$).

Table 4.3 Mean and *SD*s for enjoyment, motivation, physical, and cognitive challenge ratings across childhood and adolescence, ranging from 1 (Very Low) to 5 (Very High).

	Childhood	Adolescence	Overall
Enjoyment			
Coach-led Practice	High to Very High 4.43 ± 0.73	High to Very High 4.46 ± 0.60	High to Very High 4.44 ± 0.67
Individual Practice	High to Very High 4.18 ± 0.91	High to Very High 4.03 ± 0.69	High to Very High 4.10 ± 0.80
Peer-led Play	High to Very High 4.49 ± 0.65	High to Very High 4.42 ± 0.62	High to Very High 4.45 ± 0.63
Competition	High to Very High 4.59 ± 0.67	High to Very High 4.44 ± 0.49	High to Very High 4.52 ± 0.61
Motivation			
Coach-led Practice	Moderate to High 3.54 ± 0.93	Moderate to High 3.84 ± 0.68	Moderate to High 3.69 ± 0.82
Individual Practice	Moderate to High 3.49 ± 1.06	Moderate to High 3.55 ± 0.72	Moderate to High 3.52 ± 0.89
Peer-led Play	Moderate to High 3.44 ± 1.18	Moderate to High 3.22 ± 1.04	Moderate to High 3.33 ± 1.11
Competition	Moderate to High 3.79 ± 1.02	High to Very High 4.03 ± 0.73	Moderate to High 3.91 ± 0.89
Physical Challenge			
Coach-led Practice	Low to Moderate 2.87 ± 0.82	Moderate to High 3.65 ± 0.59	Moderate to High 3.26 ± 0.81
Individual Practice	Low to Moderate 2.83 ± 1.01	Moderate to High 3.31 ± 0.80	Moderate to High 3.07 ± 0.93
Peer-led Play	Low to Moderate 2.38 ± 1.04	Low to Moderate 2.64 ± 1.04	Low to Moderate 2.51 ± 1.04
Competition	Moderate to High 3.12 ± 0.95	Moderate to High 3.94 ± 0.61	Moderate to High 3.53 ± 0.89
Cognitive Challenge			
Coach-led Practice	Low to Moderate 2.33 ± 0.91	Moderate to High 3.18 ± 0.84	Low to Moderate 2.76 ± 0.97
Individual Practice	Low to Moderate 2.38 ± 1.03	Low to Moderate 2.85 ± 0.98	Low to Moderate 2.61 ± 1.02
Peer-led Play	Very Low to Low 1.95 ± 1.02	Low to Moderate 2.20 ± 1.05	Low to Moderate 2.07 ± 1.05
Competition	Low to Moderate 2.55 ± 1.09	Moderate to High 3.49 ± 0.79	Moderate to High 3.02 ± 1.05

Physical challenge levels varied across activities and between developmental stages from low to high levels. There were significant differences in physical challenge levels between activities within childhood ($F_{2.61, 70.34} = 7.38$, $p < 0.001$) and within adolescence ($F_{1.99, 51.68} = 22.55$, $p < 0.001$). In childhood, physical challenge was rated significantly higher in individual practice and competition than in peer-led play (p's < 0.05). Whereas, in adolescence, physical challenge was rated significantly higher in competition than in all other activities (p's < 0.05), and significantly higher in coach-led practice than in peer-led play activities ($p < 0.001$). Comparisons of physical challenge ratings in activities between childhood and adolescence revealed significant differences. Physical challenge in coach-led practice ($t_{32} = 5.72$, $p < 0.001$), individual practice ($t_{30} = 2.13$, $p = 0.041$), and competition ($t_{32} = 5.46$, $p < 0.001$) increased significantly from childhood to adolescence. On average, cognitive challenge was rated lower than physical challenge across all soccer activities, though perceptions followed similar patterns to physical challenge. That is, cognitive challenge ratings also varied between activities in childhood ($F_{3.00, 81.00} = 6.02$, $p < 0.001$) and adolescence ($F_{2.57, 66.86} = 21.49$, $p < 0.001$). During childhood, cognitive challenge in competition was significantly higher than in peer-led play activities ($p = 0.002$). Whereas in adolescence, cognitive challenge was perceived to be significantly higher in both coach-led practice and competition than in individual practice and peer-led play (p's < 0.05). Within-subjects t-tests revealed that cognitive challenge in coach-led practice ($t_{32} = 5.27$, $p < 0.001$), individual practice ($t_{30} = 2.13$, $p = 0.041$), and competition ($t_{32} = 5.95$, $p < 0.001$) was perceived to be significantly higher in adolescence compared to childhood.

4.5.4 External sports

The type of external sports (excluding those engaged in as part of physical education) that players engaged in during their development, and the quantity of players engaging in each of these sports, are displayed in **Table 3.4**. Overall, 19/34 players (56%) engaged in a total of 38 external sports during development (M = 1.15 ± 1.18), with the remaining 15 players (44%) participating solely in soccer. The most frequent external sport engaged in was swimming (n = 11). Of these sports, 12 were played at recreational level, 8 at a national level, 5 at regional/county level, 4 at school level (extracurricular), and the remaining 4 were not specified. Players engaged in approximately 3-4 hours per week in external sport activities alongside soccer. Data for perceptions of enjoyment, motivation, and physical and cognitive challenge were omitted, given the variety of different sports, contexts, and participation levels present within the data.

4.6 Discussion

The present study examined the developmental activity profiles of female youth soccer players in England, focusing on engagement behaviours and perceptions of enjoyment, motivation, and physical and cognitive challenge within soccer-specific activities across development. It was hypothesised that engagement patterns would follow the early engagement developmental pathway observed in previous research on female soccer players, with some evidence of diversified sporting experiences (Ford & Williams, 2023). Specifically, all players were expected to begin soccer engagement early in childhood (Andrew et al., 2024a; Ford et al., 2020a; Güllich, 2019; Hendry et al., 2019a; Hornig et al., 2016), participate heavily in childhood soccer play, and display increasing involvement in coach-led practice across development. Modest

Table 4.4 Type of external sports engaged in and the quantity of players engaging within them.

Type of sport	No. of players
Swimming	11
Athletics	4
Running/Cross Country	4
Tennis	3
Basketball	2
Dance	2
Netball	2
Boxing	1
Cricket	1
Futsal	1
Gymnastics	1
Hockey	1
Karate	1
Lacrosse	1
Skiing	1
Table Tennis	1

engagement in other sports was also anticipated (Ford et al., 2020a; Hendry et al., 2019a). Hypotheses regarding player perceptions of developmental activities were withheld.

Consistent with hypotheses, female youth players in England began engagement in soccer early in childhood (5-6 years), with supervised practice occurring approximately one year later (6-7 years). This starting age aligns with that of professional players (~4-6 years; Andrew et al., 2024a; Ford et al., 2020a; Güllich, 2019; Hendry et al., 2019a). The similarity in start age between current academy players and professionals is notable, since start age has been shown to differentiate between professional and ex-academy players (who did not achieve professional

status) in England (Andrew et al., 2024a). The 10-year gap between the development pathways of current academy and professional players in Andrew et al. (2024a) may reflect increased opportunities and access to organised practice and informal play, likely driven by the growth in popularity of female soccer within England in recent years (The FA, 2023a). A similar pattern was observed by Hendry et al. (2019a), whereby Canadian university-level players were, on average, a decade younger than national-level players, yet engaged in soccer and joined an academy environment earlier in comparison. Supporting this, a key finding of this study provides the first empirical evidence that female academy players in England are now entering structured training environments at an earlier age (~10 years) than professional players in previous research (~12-15 years; Andrew et al., 2024a; Ford et al., 2020a; Hendry et al., 2019a). For example, many clubs now provide practice sessions for players aged 7-11 years (Chapter Two). This shift likely reflects increased accessibility and structural changes in female soccer development in England, which have not previously been documented in such detail. Overall, milestone findings support previous literature in that players engage in soccer early in childhood, but also indicate a fundamental transformation in female player development in England.

Mixed-gender soccer engagement typically began early in childhood (age 6 years), and ceased for all but one player by the end of childhood (age 12 years). Gledhill and Harwood (2014) highlighted the importance of mixed-gender soccer for initial engagement during childhood, often through play activities with older male siblings, and again during adolescence when players felt a lack of development from playing female-only soccer. However, all but one player did not continue mixed-gender soccer participation into adolescence, likely due to early entry into a female-specific academy during late childhood. A novel insight from this study is that female

youth players in England now engage in mixed-gender soccer for a shorter duration (~4-5 years) compared to previous generations (8 and 6 years respectively; Hendry et al., 2019a; Gledhill & Harwood, 2014). This shift reinforces the growing accessibility of female-specific practice opportunities, thereby reducing the reliance on organised mixed-gender settings for skill development. Therefore, while mixed-gender soccer may remain important for initial entry into the sport, it may be less critical for sustained engagement. This finding is particularly important, as it reflects broader changes in the inclusivity and infrastructure of female soccer in England, an area that has not been well-documented in previous research.

On average, players accumulated approximately 5,600 hours in soccer activities throughout their development, which is lower than the 6,000-8,000 hours reported in previous professional samples (Ford et al., 2020a; Hendry et al., 2019a). As noted by Andrew et al. (2024a), these differences may stem from varying talent development systems and programmes, such as demographics, opportunities and sociocultural influences that are unique to individual nations (Bennett et al., 2019; Kelly et al., 2023). However, total soccer engagement exceeded that of professional and ex-academy players from England (~2,000-4,000; Andrew et al., 2024a), extending previous research by illustrating within-nation differences. Recent structural changes in female soccer within England, such as the introduction of Regional Talent Clubs (RTCs) in 2016 and their rebranding as Emerging Talent Centres (ETCs) in 2022, have coincided with the development pathways of players in the present study. These changes aimed to increase the number of coach-led practice sessions and technical staff within academies, and improve accessibility to these environments (The FA, 2023c). This may contribute to the higher levels of soccer engagement observed compared to earlier cohorts of professional players in England

(Andrew et al., 2024a), who developed under different conditions prior to such substantial changes.

During childhood, soccer engagement was initially characterised by high levels of peer-led play compared to other activities, until players reached age 8-9 years, aligning with existing recommendations (Ford et al., 2020a; Güllich, 2019; Hornig et al., 2016). That is, meaningful amounts of early childhood play have been associated with long-term career success (Ford et al., 2009; Ford & Williams, 2012) and holistic skill development (Forsman et al., 2016), including enhanced perceptual-cognitive abilities (Roca et al., 2012) and the development of psychological traits such as grit (Larkin et al., 2015). The soccer governing body in England (The FA) also encourages childhood play activities via implementation of steps to avoid early specialisation in soccer, including a focus on a broad range of movement skills, technical skill-building games within soccer contexts, and play activities in practice sessions, along with delaying competitive play until ages 6-7 years (The FA, 2020d). However, once players joined an academy, their engagement in peer-led play declined as involvement in formal soccer activities increased, mirroring previous research (Andrew et al., 2024a; Ford et al., 2020a). This shift was marked by a significant decrease in peer-led play activities and corresponding increases in coach-led practice and competition activities from childhood to adolescence. The reduction in peer-led play coincided with academy entry, and continued to decrease throughout adolescence, suggesting that academy-related activities increasingly replaced informal play. Notably, during adolescence, engagement in coach-led practice significantly exceeded all other soccer activities. This could be due to additional coach-led practice opportunities with youth international teams on top of club-level participation, of which a portion of players reported.

Alongside engagement patterns, perceptions of enjoyment, motivation, physical challenge, and cognitive challenge were evaluated for each soccer-specific activity throughout development. Enjoyment was consistently rated as high to very high across all activities during childhood and adolescence, which have been associated with increased performance levels within female soccer (Petterson et al., 2021), and sustained engagement within sports (Back et al., 2022). Unlike previous studies whereby competition was consistently rated as the most enjoyable activity (Ward et al., 2007), these findings suggest that coach-led practice is now equally as enjoyable. This suggests a potential shift in practice session design, with coaches replicating the motivational and challenging aspects of competition within practice through games-based activities (Gledhill et al., 2017; Williams & Hodges, 2005; 2023), a method that has also been associated with long-term success amongst German female players (Güllich, 2019).

Motivation was generally moderate to high across development. Motivation for coach-led practice increased significantly from childhood to adolescence, suggesting that joining an academy in later childhood enhanced subsequent motivation levels. This likely facilitated enjoyment and goal-directed behaviours in players, which can encourage sustained participation (Weiss et al., 2009). Childhood deliberate play activities, which are inherently enjoyable and intrinsically motivating, have also been considered a prerequisite for long-term engagement and eventual specialisation in a given sport (Côté, 1999; Côté et al., 2007; 2012; Güllich et al., 2020). The present study partially supports this idea, as play activities were rated highly for enjoyment and motivation, though these levels did not exceed those of other soccer-specific activities during childhood. Moreover, the specific nature of motivation (i.e., intrinsic vs extrinsic) was not measured, making it difficult to ascertain whether play was

intrinsically driven. For example, high motivation in childhood may stem from inherent enjoyment, yet equally high motivation during adolescence could be driven by external rewards such as selection into youth national teams or academy squads. In support of this idea, Güllich et al. (2020) highlighted the multidimensional nature of youth athletes' participation motives. Future research could explore the internalisation and integration of motivation in female players across different developmental activities to understand participation motives, by drawing upon tenets of self-determination theory (Ryan & Deci, 2000). Although, existing studies on male players showed little evidence to suggest that childhood play or diversified sporting experiences are related to more self-determined forms of motivation (Hendry et al., 2014; Thomas & Güllich, 2019).

Distinct physical and cognitive challenge components were measured to assess the degree of perceived effort within each soccer-specific activity (Andrew et al., 2024a; Hendry et al., 2019a). Consistent with these studies, competition was consistently rated as the most challenging activity across development, and play the least. During childhood, practice and play activities were perceived as low to moderate in physical challenge, and competition as moderate. As players progressed into adolescence, physical challenge in practice and competition activities increased significantly, reaching moderate to high levels. This supports the idea that effortful practice, which demands high levels of challenge, can be perceived as enjoyable by athletes, as reflected in the high enjoyment ratings within these activities (Abuhamdeh & Csikszentmihalyi, 2012; Andrew et al., 2024a; Güllich et al., 2020; Helsen et al, 1998; Hodges & Starkes, 1996; Young & Salmela, 2010), and therefore questions the extent to which players engaged in deliberate practice activities during their development, which are defined as being low in inherent enjoyment (Ericsson et al.,

1993). Nevertheless, a monotonic increase (i.e., increases at each successive developmental stage) in practice engagement across development was observed that also perceptually increased in both physical and cognitive challenge, which is indicative of eventual expertise in a given domain (Baker & Young, 2014; Young et al., 2021).

Furthermore, in line with Hendry et al. (2019a), players engaged in activities with moderate to high levels of physical and cognitive challenge during adolescence – indicative of quality engagement, and considered a level of challenge to be in the optimal zone for learning (Hodges & Lohse, 2022). This is significant, as engagement in such challenging activities can differentiate levels of expertise in female soccer and is linked to sustained participation (Andrew et al., 2024a; Hendry et al., 2019a) and high enjoyment (Abuhamdeh & Csikszentmihalyi, 2012). Within this optimal challenge zone, learners are expected to make errors due to the higher functional task difficulty relative to their skill level (Guadagnoli & Lee, 2004; Williams & Hodges, 2023). These errors, while crucial for learning, can also have implications for motivation (Hodges & Lohse, 2022): if challenge is too low, activities may become unstimulating; if too high, frustration and demotivation may result from unattainable outcomes. Therefore, coaches must carefully balance the benefits of learning through errors against the potential motivational costs (Hodges & Lohse, 2022). Findings from the present study suggest that coaches are adequately navigating this balance, as both motivation and challenge within coach-led practice were rated as moderate to high – neither too easy nor too difficult for the skill level of players.

Cognitive challenge generally followed similar patterns to physical challenge, although was consistently rated lower across all soccer activities across development. This underscores the importance of assessing challenge through multiple components,

as each offers unique outcomes despite displaying similar patterns (Andrew et al., 2024a; Hendry et al., 2019a). Overall, perception findings indicate that soccer activities were highly enjoyable and motivating throughout player development in formal soccer activities (coach-led practice and competition) and players perceived activities to be appropriately challenging, both physically and cognitively, upon joining an academy learning environment. This has positive implications for sustained engagement in soccer.

Engagement findings align with previous studies on professional female samples, in that players engaged in a higher proportion of soccer compared to other sports throughout their development (Ford & Williams, 2023). Specifically, approximately 44% of players engaged exclusively in soccer throughout their development, notably higher than reported in professional samples (~25% of players; Ford et al., 2020a; Güllich, 2019; Zibung and Conzelmann, 2013). For those that displayed diversified experiences in other sports, players engaged in an average of 1-2 external sports at a rate of 3-4 hours per week, comparable to engagement patterns of professional players from England (Andrew et al., 2024a). In contrast, professional female players from other nations engaged in ~4 other sports for 2-3 hours per week (Ford & Williams, 2023), suggesting that the degree of diversification may be partly dependent on the sporting culture within a particular nation. For example, the most popular external sports were swimming, athletics and tennis, which are similar to those engaged in by male youth players (Ford & Williams, 2012) and female players (Andrew et al., 2024a) from England. However, this rate of engagement is considerably less than reported in team sport studies often used as evidence supporting early diversification (Baker et al., 2003), where athletes typically participated in at least six external sports alongside the primary sport (Soberlak and Côté, 2003).

Moreover, Ford and Williams (2017) suggested that team-based sports are most frequently performed in conjunction with the primary sport, which would facilitate skill transference between sports, however this is not reflected in the present study, whereby a larger proportion of external sports that players engaged in were individual (e.g., swimming) rather than team-based (e.g., basketball), thus limiting transference of skills (e.g., movement) relevant to soccer.

The present study contributes several new contemporary insights into the engagement patterns of current female youth soccer players by demonstrating: (1) earlier entry into academy environments than previous professional players, likely due to structural changes in English female youth soccer; (2) a reduced reliance on mixed-gender soccer for skill development, suggesting greater accessibility to female-specific practice opportunities; and (3) positive player perceptions of the practice environment, where coach-led practice was rated as equally enjoyable as competition. These findings provide valuable insights into how the growing popularity and structural advancements in female soccer are shaping player development trajectories, though the study is not without limitations. While the PHQ has been established as a reliable and valid tool (Ford et al., 2010b), the retrospective design of the study inherently introduces risks of memory recall error and bias (Baker et al., 2023; Côté et al., 2005; Hopwood, 2015; Güllich, 2017; 2018), although this is less pronounced with youth players compared to adult samples due to the shorter recall timeframe. Additionally, the relatively small sample size may limit the generalisability of findings to all players. Despite this, the sample used represents approximately 17% of all players in academy development squads of clubs within the top league tier of female youth soccer in England, and is comparable in size to previous samples (Andrew et al., 2021a; 2024; Güllich, 2019; Hendry et al., 2019a). Another limitation is the lack

of analysis on the microstructure of soccer activities, which has been explored in prior research (e.g. Ford et al., 2010a; Güllich, 2019). For example, examination of the microstructure of practice sessions could reveal whether coach-led practice structure is predominantly games-based, thus explaining why these sessions were rated as high in enjoyment as play and competition activities, due to their 'play like' nature. Future research should therefore include a detailed and context-specific investigation into the microstructure of practice activities in female youth soccer. Finally, the scope of these findings may not extend to players at different performance levels, as developmental pathways can be culturally and contextually specific (Andrew et al., 2024a; Ford & Williams, 2017; Güllich, 2019; Hendry et al., 2019a). Consequently, comparisons with other soccer samples should be approached cautiously. Nevertheless, the present research contributes valuable information on the developmental practice histories of female soccer players from one nation during a period of significant structural change and exponential growth.

4.7 Chapter Summary

In summary, the developmental pathways of current female youth players from England were characterised by early engagement in soccer through a balance of enjoyable and motivating childhood play and practice activities, early entry into an academy environment during late childhood, and a subsequent progressive increase in formal soccer activities (coach-led practice and competition) during adolescence, which have been linked to higher levels of later adult expertise (Sarmento et al., 2018). This shift toward earlier academy entry and increased organised practice opportunities, compared to the experiences of current professional players (Andrew et al., 2024a),

reflects significant changes and advancements to the infrastructure of female soccer within England, contributing to increased opportunities for engagement that can potentially shape the future success of these players. These findings highlight the importance of context-specific research in understanding the diverse pathways that lead to elite performance within a given nation. Consistent with existing literature, development pathways aligned with the early engagement model of expertise development, with some evidence of diversified sporting experiences (Ford & Williams, 2023). Although these players have not yet reached senior-level expertise, findings underscore the value of investigating current youth players to generate contemporary insights into developmental milestones and trajectories. As female soccer continues to grow, such insights will be critical in further shaping and refining development programmes that support holistic skill development and sustained player engagement.

Having examined the macrostructure of participation histories in the present study, Chapter Five will shift focus to the microstructure of coach-led practice sessions, further reinforcing the broad-to-narrow approach of the thesis. Specifically, it will explore the role of coaches in player development by analysing the nuances of coach-led practice sessions within a single female soccer academy.

5 Practice activities and behaviours employed by youth soccer coaches within a professional female soccer academy in England: A case study

5.1 Chapter overview

The preceding chapters of this thesis have explored processes occurring within female soccer development environments (i.e., academies) and the progression of players along the talent pathway. A key finding from Chapter Four highlighted that player engagement in coach-led practice activities increased significantly from childhood to adolescence, aligning with academy entry around the age of 10 years. Given that players spend a large proportion of their soccer engagement within these structured practice sessions, Chapter Five shifts focus to a detailed investigation of their content and delivery. Using a mixed-methods approach, this chapter investigates how coaches structure session activities and explores the behaviours and verbal interactions they employ during these sessions.

5.2 Abstract

Previous research investigating the microstructure of practice activities and coach behaviours pre-date or coincide with the professionalisation of female soccer within England in 2018. Following substantial structural developments at youth level, an examination of these aspects within the female youth soccer context is required to understand current practice and guide further growth. A case study approach was adopted to explore practice structure, coaching behaviours, and the rationales behind their use within coach-led practice sessions. Fourteen youth soccer coaches and the academy director from a single Category 1 Academy within England participated. Systematic observations of activities and behaviours within practice sessions were conducted and analysed using a computerised coding program, followed by individual

video feedback sessions and stimulated recall interviews with each coach. Coaches predominantly used games-based (54%) over drill-based activities (24%), which was consistent across all age categories (U-10 to U-16), and was influenced by coach education, individual coaching philosophies and the environment created by the academy director. Transition periods between activities were perceived as excessive (22%), but varied between age categories. High levels of instruction and praise were provided to maintain an intense and positive learning environment, whereas some coaches utilised silence to promote autonomous learning, reflecting varied coaching styles. Dual-coaching also effectively ensured players were engaged and appropriately challenged. This study provided contemporary data on the microstructure of practice activities and coaching behaviours to add to existing knowledge, and explored these aspects within the female soccer context for the first time, offering practical implications for coaching practice.

5.3 Introduction

Female soccer is on the rise globally, with participation rates increasing by 24% between 2019-2023 (FIFA, 2021). Within England, the rise in popularity of female soccer has been driven by increased media coverage and attendances (live and television), recent international success of the senior national team (e.g., winners of the UEFA European Championships (2022) and Finalissima (2023), as well as runners-up in the FIFA World Cup (2023)), structural changes to youth development programmes, and the professionalisation of the WSL. To continue this success, The FA in England have continued to invest in their talent identification and development processes. For example, as a result of increased interest and participation rates, clubs

are expanding their provision of coach-led practice sessions at youth level (Chapter Two). Within these sessions, coaches play a critical role in the skill acquisition and overall development of talented youth players (Ford et al., 2010a). This responsibility is heightened in female youth soccer environments, where coaches are relied upon to nurture the skills required for progression towards the senior team, due to financial constraints that limit the recruitment of talented players (Chapter Two). Therefore, effective design and delivery of practice sessions by coaches is fundamental, given that players typically accumulate between 2,000-6,000 hours of coach-led practice before achieving expert levels of performance in adulthood (Andrew et al., 2024a; Güllich, 2019; Hendry et al., 2019a; Ford et al, 2020a). Despite a continuous growth of talent identification and development research within female soccer contexts (Okholm Kryger et al., 2021), exploration of session structure and coach behaviour within this domain, and on female coaches, remains limited (Cope et al., 2017; Ford & Williams, 2023; Larkin et al., 2022).

Previous research exploring talent development of female soccer players has focused on the macrostructure of coach-led practice sessions (e.g. Ford et al., 2020a; Hendry et al., 2019a). For example, retrospective analyses indicated that professional players in England typically participated in around 2,000-3,000 hours of physically demanding coach-led practice during their formative years (Andrew et al., 2024a). Furthermore, players in Germany spent 35-40% of these sessions engaged within drill-based activities (i.e., repetitive isolated skills involving limited or no opposition), and 45-50% in games-based activities (i.e., exercises involving opposition and teammates that closely replicate game conditions; Güllich, 2019). While these findings detail the quantity and types of soccer-specific practice activities engaged in by players, they imply that all practice hours contribute equally to skill development. They also

overlook the finer details and intricacies (i.e., microstructure) of coach-led sessions, including practice design (Andrew et al., 2021a; Ford et al., 2010a) and coaching behaviours used to facilitate skill acquisition, such as instruction (Andrew et al., 2024b), feedback (Mason et al., 2021; Otte et al., 2020; Salmoni et al., 1984), or questioning techniques (O'Connor et al., 2021).

One way to explore the microstructure of coach-led practice sessions is to conduct systematic observations (Cope et al., 2022). Several studies have observed the activities and/or behaviours employed by coaches working with male soccer players of various ages and skill levels (e.g., Andrew et al., 2021c; 2024a; Cushion & Jones, 2001; Ford et al., 2010a; O'Connor et al., 2018; Partington & Cushion, 2013; Partington et al., 2014; Potrac et al., 2002; 2007; Roca & Ford, 2020; Stonebridge & Cushion, 2018; Stodter & Cushion, 2019). Many of these studies indicated that coaches typically employed activities and behaviours that differ from motor learning literature recommendations (Williams & Hodges, 2005; 2023). For example, session structures were composed of a greater proportion of isolated skill activities (i.e., drill-based activities) compared to those that simulate game play conditions (i.e., games-based activities; Andrew et al., 2021c; Ford et al., 2010a; Partington & Cushion, 2013; Partington et al., 2014). Such session design is thought to limit opportunities for players to develop key perceptual-cognitive skills, such as anticipation and decision-making, that are essential for the demands of the professional game (Williams & Reilly, 2000). Moreover, coaches applied a prescriptive and directive approach, consisting of frequent instructions and feedback (Cushion & Jones, 2001; Ford et al., 2010a; Partington & Cushion, 2013; Partington et al., 2014). However, this approach risks inducing information overload that can potentially attenuate skill acquisition, retention and transfer (Hendry et al., 2015; Williams & Hodges, 2023). Although,

recent studies have indicated that the gap between science and application may be narrowing. For example, coaches appear to be employing a higher proportion of activities representative of the game (e.g., possession games, conditioned games) into their sessions (Ford & Whelan, 2016; Feng et al., 2023; Fuhre & Sæther, 2020; Güllich, 2019; O'Connor et al., 2018; Stonebridge & Cushion, 2018), and are using verbal instructions that focus players' attention on movement effects, which can enhance learning (Chua et al., 2021). It remains unclear whether these changes may have been influenced by engagement in formal education (Ford & Whelan, 2016), co-created educational workshops and interventions (Andrew et al., 2021c; 2024b; Eather et al., 2020; Jones et al., 2023), or other factors.

Talent development research has also illuminated the cognitive strategies and rationales behind the observed behaviours of coaches in practice sessions (Andrew et al., 2021c; Cushion et al., 2012a; Nind & Lewthwaite, 2018; Partington et al., 2015). By combining systematic observation data, video feedback, and reflective questioning via interviews, a comprehensive analysis is achieved that can inform future practice designs and behaviours (Cope et al., 2017; 2021; 2022; Partington et al., 2015). For example, follow-up interviews have indicated that one motive for the prescription of drill-based activities was to provide players with greater opportunities to develop specific technical skills (e.g., passing), through repetition and without opposition, which coaches believed was important for learning (Andrew et al., 2021c). Once coaches were aware of the benefits of games-based activities, adaptations to practice structures were made. Therefore, this approach can enhance understanding of practice, by stimulating awareness, discussion and reflection, making it a powerful learning tool for promoting behaviour change (Cope et al., 2021; 2022; Raya-Castellano et al.,

2021; Partington et al., 2015). Such methods can be effective in bridging the gap between science and practice (Hendry et al., 2015; Williams and Hodges, 2023).

Given the limited research on talent development in female-only athletes (Curran et al., 2019; Peters et al., 2022) and recent structural changes to youth talent pathways in England, the microstructure of practice in female youth soccer remains unclear (Andrew et al., 2024a). Understanding how findings from this context align with existing literature and pedagogical approaches may help inform and guide the ongoing development of the female game and the practitioners operating within it (Emmonds et al., 2019).

Accordingly, the present case study employed a mixed-methods approach to investigate the practice activities and behaviours employed by coaches in a professional female youth soccer academy in England, and to understand the perceptions driving their implementation. Although recent studies have shown a greater proportion of games-based activity provision (e.g., Andrew et al., 2021c; Roca & Ford, 2020), it still remains unclear whether these findings will apply to coaches of female players. Moreover, it is hypothesised that coaches will employ a prescriptive approach to coaching, consisting of high levels of instruction, feedback and praise behaviours (Cushion & Jones, 2001).

5.4 Methodology

5.4.1 Participants

In total, 14 coaches and the academy director from a single female Category 1 Academy (highest tier) within England agreed to participate. At the time of data collection (2022-23 season), the senior team at the club were competing in the WSL.

Coaches were aged between 22-52 years (M = 34.3 ± 10.0 years) with between 5-28 years (M = 13.7 ± 8.3 years) of coaching experience, and 2-26 of these years (M = 8.8 ± 7.3 years) specifically in female soccer. All coaches (eight male, six female) either held, or were working towards the UEFA coaching licences. Two coaches held the UEFA A (Level 4/5), seven held the UEFA B (Level 3/5), and the remaining five held the UEFA C (Level 2/5) licences. The academy had six age groups (U-10; U-11; U-12; U-13; U-14; U-16) with two coaches (one male; one female) responsible for each. The remaining coaches (two male) led supplementary futsal practice. During data collection, no member of the research team held, or had previously held a position at the club. Youth players within all age groups typically engaged in two practice sessions (90-120 minutes each) and one competitive match (60-80 minutes) per week, alongside one additional strength and conditioning session. All participants provided written informed consent. The study was designed in accordance with the Declaration of Helsinki (2013) and approved by the local University ethics board (22/SPS/066).

5.4.2 Study design

In line with the broader thesis, this study is underpinned by a pragmatic research paradigm, prioritising the selection of methodological choices that best address the research question rather than adhering strictly to a single ontological or epistemological stance (Cresswell & Plano Clark, 2018; Morgan, 2014). Pragmatism recognises that reality is both socially constructed and influenced by objective factors, rejecting rigid dichotomies between realism and relativism. Instead, it focuses on generating meaningful and applicable knowledge that can inform practice.

From an ontological perspective, this study acknowledges that reality is shaped by both individual experiences and observable phenomena within a given context

(Morgan, 2014). The coaching environment is inherently dynamic, encompassing multiple perspectives on what constitutes effective practice activities and behaviours. Therefore, rather than seeking a universal or purely subjective truth, this study aims to provide a rich, context-specific understanding of coaching practices, where both structured observations and individual interpretations are integrated to construct knowledge.

Epistemologically, this research embraces pluralism by incorporating both quantitative and qualitative insights. Systematic observations provide structured, empirical data on coaching activities and behaviours, while stimulated recall interviews capture the lived experiences and reasoning behind practice. This combination reflects a pragmatic epistemology, where knowledge emerges from both measurable patterns and subjective interpretations (Tashakkori & Teddlie, 2010), with the goal of generating actionable insights to enhance coaching practices. Additionally, the reflexive nature of this approach accounts for the researcher's role in interpretation, ensuring that findings are both data-driven and critically examined (Braun & Clarke, 2020). By integrating multiple perspectives, this approach strengthens the depth, validity, and applicability of findings.

The methodological implications of pragmatism are reflected in the study's design. A case study approach, defined as a concentrated investigation of a single group (Heale & Twycross, 2018), was adopted to gain a comprehensive understanding of the practice activities and behaviours used by a group of youth coaches in the natural context of practice sessions. This design ensures that findings are not only theoretically relevant but also practically meaningful for coaches and sport practitioners operating within similar performance environments.

5.4.3 Systematic observations

Systematic observation is a highly structured method allowing a trained observer to record and analyse events or behaviours using a predefined coding system (Franks et al., 2001; Partington & Cushion, 2013), and remains a prevalent data collection method for understanding the practice activities and behaviours of coaches in high performance sport (Cope et al., 2017; 2022). To assess activity types, a coding system from previous literature was implemented (Ford et al., 2010a; Andrew et al., 2021c). Three soccer practice activities, including sub-activities, were categorised for analysis (see **Table 5.1** for definitions). O'Connor et al. (2018) highlighted that within these activities, players are not always actively participating, thus time spent active and inactive within drill-based and games-based practice activities were also measured. Active time referred to any time players were actively participating in an activity (i.e., ball is rolling), and inactive time referred to any time the session was paused by the coach during an activity to make a coaching point, either through freezing the session, or by calling players in for a huddle mid-activity. Akin to O'Connor et al. (2018), time spent active and inactive were measured on a group, rather than an individual level. Inter-observer (90%) and intra-observer (100%) reliability scores for practice activity data exceeded the recommended level of agreement (85%; van der Mars, 1989).

Alongside practice activities, coaching behaviours were also investigated via systematic observation. In coaching literature, the Arizona State University Observation Instrument (ASUOI; Lacy & Darst, 1984) and the Coach Analysis and Intervention System (CAIS; Cushion et al., 2012b) have been the most frequently used coding systems, yet both are often adapted by researchers to align with their research purposes (Cope et al., 2017). In the present study, modifications to the CAIS were

Table 5.1 Soccer practice activity types and definitions.

Activity Type	Definition
Drill-based	Activities executed in isolation or small groups that do not have a game-play context.
Fitness	Improving fitness aspects of the game with no technical or tactical focus (e.g., warm-up; cool-down; conditioning).
Technical	Isolated technical skills unopposed either alone or in a group.
Skills	Isolated technical or tactical skills from game situations, in a small group with some opposition.
Games-based	Activities executed with opponents and teammates that have a game-play context.
Small-sided Game	Match-play with reduced pitch size, two equal goals, and a reduced number of players.
Conditioned Game	As small-sided games, but with variations to rules, goals, or areas of play (e.g., teams scoring by dribbling across end-line, players playing for both teams in possession, zones, etc.).
Phase of Play	Uni-directional match-play towards one goal.
Possession Game	Games with no goals in which the main intention is for one team to maintain possession of the ball.
Transition	Movement from one activity to another, or an activity that is not soccer related (e.g., drinks breaks). This includes the coach's explanation of the forthcoming activity and debrief of the preceding activity.
Active Time	Any time players were actively participating in an activity (i.e., ball is rolling).
Inactive Time	Any time the session was paused by the coach mid-activity to make a coaching point (e.g., freezing the session, calling players in for a huddle).

developed in compliance with the five stage process for the development and validation of instruments (Brewer & Jones, 2002): (1) *Observer training* – a 4-week training period was undertaken by the observer, involving manual coding of sample coaching sessions from pilot testing. The purpose of this training period was to familiarise with behavioural classifications on both the ASUOI and CAIS, practice the coding process (e.g. strictly adhering to behaviour definitions), and determine the instrument to be used during the systematic observations; (2) *Amending an existing observation instrument* – following the manual coding process and a review of relevant coach behaviour literature (e.g., Ford et al., 2010a; O'Connor et al., 2018; Partington & Cushion, 2013), it was determined that coding with the ASUOI produced extensive 'uncodable/other' behaviours and therefore inadequately sampled the range of behaviours exhibited by coaches, whereas the CAIS more comprehensively reflected observable behaviours in practice sessions. To determine content validity, the CAIS was adapted based on pilot testing and modifications from previous research (Partington & Cushion, 2013), leading to 25 unique behaviours within 7 primary behaviour categories (instruction; questioning; feedback; demonstration; organisation; silence; other). For behaviour categories and definitions, see **Table 5.2**. The behaviours 'physical assistance' and 'punishment' were removed from the final coding system due to no instances being recorded during pilot testing and a general absence of these behaviours in soccer (e.g. Ford et al., 2010a; Partington & Cushion, 2013; Partington et al., 2014; Potrac et al., 2002; 2007). The direct and indirect management behaviours from the CAIS were incorporated into a single 'management' behaviour. Due to the presence of dual-coaching within the club (i.e., both coaches collaboratively coaching the session, with no 'assistant' coach), 'confer with assistants' was renamed to 'colleague interaction', and 'colleague intervention' was included as a form of

silence to reflect when the additional coach was interacting with players. The purpose of the modifications was to identify as many observable behaviours as possible and reduce the 'uncodable' frequency to behaviours not relevant to soccer or those that are a natural part of coaching sessions (e.g., informal chat with players/coaches/parents, checking injuries); (3) *Establishing face validity* – the modified instrument was discussed with the academy director rather than coaches to eradicate the influence of this process on later coaching behaviours. The adapted behaviour instrument was deemed appropriate and relevant by the academy director, who had at least 10 years of coaching experience and held the UEFA A (level 4/5) coaching license, therefore could be regarded as a specialist within coaching; (4) *Inter-observer reliability;* and (5) *Intra-observer reliability* – the modified instrument was tested for reliability agreements using the following calculation: (agreements/ (agreements + disagreements)) x 100 (Darst et al., 1989). Both inter-observer (90%) and intra-observer (100%) reliability scores for behaviour coding surpassed the recommended acceptance levels (80-85%; Cushion et al., 2012b; van der Mars, 1989).

5.4.4 Procedure

Coaches were briefed on the study aims and procedure at the training ground a week prior to data collection. Once consent was provided by coaches, two members of the research team conducted pilot testing to determine an appropriate filming position and ensure video and audio information were being captured. Three practice sessions were filmed and subsequently coded to allow for observer habituation before data collection (Darst et al., 1989). Parents were informed of the research by the club and filming consent was obtained. Systematic observations of practice sessions were conducted for 12 coaches over a period of 10 weeks between November 2022 and January 2023.

Table 5.2 Coaching behaviour categories and definitions of the amended CAIS (Cushion et al., 2012b).

Behaviour Category	Definition
Instruction	
Pre-instruction	Initial information given to a player(s) preceding the desired action to be executed. Used to explain how to execute a skill, play, assignment, strategy, and so forth.
Concurrent Instruction	Cues or reminders given to a player(s) during the actual execution of the skill or play.
Post-instruction	Information given to a player(s) after the execution of the skill or play.
Questioning	
Convergent Questioning	Any question to player(s) concerning strategies or techniques with a limited number of correct responses/options – closed responses.
Divergent Questioning	Any question to player(s) concerning strategies or techniques with multiple responses/options – open to various responses.
Feedback	
Positive Feedback	Positive or supportive statements, specifically aiming to provide information about the quality of performance.
Negative Feedback	Negative or unsupportive statements, specifically aiming to provide information about the quality of performance.
Corrective Feedback	Corrective verbal statements provided by the coach containing information that specifically aims to improve the player(s) performance at the next skill attempt.
Knowledge of Results	Feedback provided to the player(s) relating to the outcome of an action.
Knowledge of Performance	Feedback provided to the player(s) on the movement pattern that caused the result.
Praise	Verbal compliments, statements, or signs of acceptance expressed towards a player(s) that DO NOT specifically aim to improve player performance at the next skill attempt.
Scold	Verbal or nonverbal behaviours of displeasure or disappointment expressed towards a player(s) that DO NOT specifically aim to improve player performance at the next skill attempt.

Table 5.2 Continued.

Behaviour Category	Definition
Positive Reinforcement	General statements agreeing with the intervention or response/s provided by one or more players.
Negative Reinforcement	General statements disagreeing with the intervention or response/s provided by one or more players.
Demonstration	
Positive Modelling	Provision of a demonstration of correct performance of a skill or playing technique.
Negative Modelling	Provision of a demonstration of incorrect performance of a skill or playing technique.
Player Participation	A player actively verbalises or demonstrates the correct or incorrect decision or execution of a skill, technique, movement, positioning etc. at any given point of the session.
Organisation	
Management	Verbal statements directed towards players relating to organisational details of practice sessions, not referring to strategies or skills (e.g., organising equipment, allocating players to teams).
Colleague Interaction	Verbal exchanges with fellow coaches directly related to the practice session, concerning activities, strategies, and organisation.
Silence	
Silence – On-task	Deliberate period of time when the coach is monitoring the practice activity without reacting verbally.
Silence – Off-task	Deliberate period of time when coach is visibly not engaged in the practice activity.
Colleague Intervention	Deliberate period of time either during or outside of a practice activity when the coach is not reacting verbally due to an intervention by a co-coach coach.
Other	
Hustle	Verbal statements intended to intensify the efforts of the player(s).
Humour	Jokes or content designed to make players laugh or smile.
Uncodable	Any behaviour that cannot be seen or heard, or does not fit into the above categories (e.g., checking injuries, informal chat with players/coaches/parents).

No systematic observation data were collected for the remaining 2 coaches due to absences during the data collection period. Practice sessions were filmed at the usual session times and venue from two separate perspectives. A digital video camera (Canon Vixia, Japan) mounted on a stationary Tripod (Libec, U.S.) situated at the corner of the training pitch captured video information of the entire session from a third-person perspective. Coaches also wore a chest-mounted action camera (GoPro, U.S.) that captured video and audio information from the coaching session from a first-person perspective.

In total, 30 full practice sessions were filmed, resulting in 2,926 minutes of footage. Average session duration was 97.5 ± 18.1 minutes. Footage was uploaded to an Apple MacBook (Apple, CA) and analysed via Hudl Sportscode software (Hudl, NE). All analysis was completed on a subsequent date and at a separate venue to allow for a thorough and in-depth analysis of the footage (Cope et al., 2017). Activity and behaviour footage were coded independently by the lead researcher, who was trained and experienced at coding on Hudl Sportscode software.

5.4.5 Stimulated recall interviews

To make changes to activities and behaviours employed within sessions (i.e., what coaches do), understanding the rationale and perceptions behind them is essential (Potrac et al., 2007). Therefore, semi-structured interviews were conducted to explore how and why coaches employed certain practice activities and behaviours (Partington et al., 2014). All interviews were audio recorded and took place as part of bespoke feedback sessions for each individual coach within a meeting room at the training complex. The academy director was actively involved in the interview and feedback process, relating individual coach findings to future practice and acting as a critical

friend to facilitate the CPD process (MacPhail et al., 2021). Such feedback sessions and interview processes have previously been successful in improving both practice activities and behaviours and facilitating learning over time (Andrew et al., 2021c; Partington et al, 2014).

Interview questions were developed following systematic observation analyses. During the interview, coaches first responded to general questions on topics relating to the planning of coaching sessions and on overall and age-group-specific findings. In the second part of the interview, the interview guide was tailored to the behaviours and activities employed by each individual coach in their sessions. For example, coaches received video feedback of a specific behaviour and were asked questions relating to their use of that behaviour (stimulated recall). Despite the absence of two coaches during the systematic observation period, interviews were still conducted with them. Their input was included in analysis as it provided meaningful new insights and perspectives. These coaches did not receive video feedback but participated in all other aspects of the interview. Following the feedback sessions, the academy director was also interviewed to provide context on participants and coaching practices, their role at the club, individual philosophy, and overall thoughts on the research findings.

5.4.6 Data analysis

A computerised analysis system was utilised for ease of coding multiple behaviours at once (Cushion et al., 2012a). All activities and behaviours were coded each time they occurred throughout the entire practice session (time-samples event; van der Mars, 1989). The duration of each activity, behaviour, and the session were also coded. Data were exported to Microsoft Excel from Hudl Sportscode before any calculations. For

each practice session, the duration of time players spent in each of the three coaching activities was coded (time-use analysis; Ford et al., 2010a). Time spent in each of the activities was divided by the total practice session time and then multiplied by 100 to calculate the percentage of session duration. These were averaged for all practice sessions to provide an overall frequency for each activity. Frequencies from coaches of each age group were also averaged to identify any differences across age groups. The time-use analysis data violated the statistical assumption of independence, which stipulates that one data point should not affect another (Field; 2017). For instance, if a significant amount of time is allocated to one activity type, there is consequently less time available for another activity type. Therefore, only statistical comparisons between age categories were possible, using three one-way ANOVAs for each activity type. For coaching behaviours, Hudl Sportscode software provided a frequency count and total duration of each behaviour in every session once coding had been completed. The percentage of behaviours per session was calculated by dividing the duration of each behaviour by the total session duration. The mean percentage of behaviours were calculated by dividing the average duration of each behaviour by the total combined behaviour duration and multiplying by 100. The rate per minute (RPM) of each behaviour was calculated by dividing the frequency count by the total session duration. A series of one-way ANOVAs were conducted to compare each behaviour group and individual behaviour between the 5 age categories. To assess behaviours observed within each activity type, separate repeated measures ANOVAs were conducted on the RPM of each behaviour within drill-based, games-based, and transition activity types. Any significant main effects were followed up with post hoc pairwise comparisons using the Bonferroni adjustment method, to identify significant differences between groups. Statistical significance level was set at $p < 0.05$.

Interviews were transcribed verbatim, anonymised via coding, and analysed through reflexive thematic analysis, a contemporary approach to Braun & Clarke's (2006) traditional thematic analysis technique that acknowledges the active role of the researcher in the production of knowledge (Braun & Clarke, 2019; 2020; Byrne, 2022). Analysis moved back and forth through the iterative six-phase process to elicit additional interpretations of the data and refine existing analysis (Braun & Clarke, 2020), aided by a worked example of this process (Byrne, 2022). The lead researcher initially immersed in the data set by transcribing and reading through each interview to become familiar with the data (Phase 1). The process of generating initial codes for any meaningful data began inductively, with codes reflecting the content of the data (Phase 2). In contrast, a deductive approach utilised the observation tool and existing literature during the creation and development of themes to meaningfully collate codes related to practice activities and behaviours (Phase 3). Themes were presented back to other members of the research team who had the opportunity to critically challenge, check and refine the theme selection to enhance analytical rigour (Phase 4), before themes were subsequently named and defined (Phase 5). Following reflective discussions with the research team, data were reviewed a final time to construct the themes and subthemes that are presented (Phase 6). For example, within Theme 2, the subtheme 'understanding of games-based activities' was changed to 'rationale for games-based activities' following these discussions.

5.4.7 Trustworthiness

To ensure the trustworthiness of this study, multiple strategies were employed to enhance credibility, dependability, confirmability, and transferability (Lincoln & Guba, 1985). Credibility was established through data triangulation, combining

quantitative systematic observation with qualitative stimulated recall interviews to develop a comprehensive understanding of practice activities and coaching behaviours. Member checking was incorporated into the formal feedback process, allowing coaches to review and clarify their responses to ensure their perspectives were accurately represented. Additionally, themes were critically reviewed by other members of the research team to ensure that interpretations were robust and well-founded. Dependability was maintained through a systematic and reflexive approach to thematic analysis. The use of an iterative six-phase process ensured that coding and theme development were continually refined, while following a worked example (Byrne, 2022) provided transparency and clarity in how themes were generated and refined over time. Confirmability was promoted through ongoing reflexivity, with the lead researcher critically reflecting on how their positionality and core interests influenced data interpretation. Discussions with a member of the research team helped explore potential biases to ensure that themes were constructed thoughtfully rather than predetermined. The study therefore presents an interpretation grounded in both the data and the researcher's theoretical and experiential lens. Further, the potential influence of the academy director's presence during interviews was acknowledged and reflected upon in relation to participant responses. Finally, transferability was supported by providing rich, contextualised descriptions of the research setting, and immersion of the lead researcher into the practice environment. By offering detailed insights into this setting and of the analytical process, this study allows readers to assess the applicability of findings to other coaching contexts. Rather than broad generalisation, the goal is to produce insight that may be meaningfully applied in similar settings. Through incorporation of these strategies and principles, the study

ensures a rigorous and reflexive approach to understanding practice activities and coaching behaviours within female youth soccer.

5.5 Results

5.5.1 Practice activities

Coaches prescribed a greater proportion of games-based activities (54.3 ± 15.4%) than drill-based activities (23.6 ± 15.9%), supporting recent literature (Fuhre & Saether, 2020; O'Connor et al., 2018; Roca & Ford, 2020; Stonebridge & Cushion, 2018). This was consistent across all age categories at the academy (see **Table 5.3**). One-way ANOVAs revealed no significant main effect of age category on drill-based ($F_{5, 32}$ = 0.29, $p > 0.05$) or games-based ($F_{5, 32}$ = 0.35, $p > 0.05$) activity proportions. Similar to O'Connor et al. (2018), all coaches typically structured practice sessions to progress from drill-based to games-based activities. Sessions typically started with fitness, followed by technical and skill-based activities, before progressing to conditioned or small-sided activities, and finishing with a small-sided game. Transition accounted for 22.1 ± 6.6% of total session time. Unlike drill-based and games-based activity types, the proportion of time spent in transition significantly differed as a function of age category ($F_{5, 32}$ = 3.394, p = 0.014). Bonferroni post hoc tests revealed that U-11 coaches (30.6 ± 3.1%) spent significantly more time in transition than U-12 (16.7 ± 7.3%, p = 0.049) and U-16 (16.8 ± 2.7%, p = 0.026) coaches. Players were active (i.e., ball-rolling) for 63.4 ± 8.6% of an average session. Within drill-based activities, players were active for 74.5 ± 9.7%, with the remainder of time spent inactive either in huddles or the activity frozen by coaches to make coaching points. The proportion of time spent active within games-based activities was 79.8 ± 10.0%.

Table 5.3 Mean percentage (and *SD*s) of time spent within practice activity states, and spent active (i.e., ball-rolling), during each specific practice activity state.

	U-10	**U-11**	**U-12**	**U-13**	**U-14**	**U-16**	**Mean**
Drill-based	25.4 ± 10.5	20.4 ± 5.8	19.9 ± 10.3	21.7 ± 20.1	23.8 ± 21.6	30.4 ± 6.6	23.6 ± 15.9
Drill-based Active	76.8 ± 11.4	79.6 ± 0.5	92.8 ± 7.5	52.1 ± 43.8	56.9 ± 40.0	88.5 ± 7.8	74.5 ± 9.7
Games-based	52.1 ± 8.7	49.0 ± 8.9	63.4 ± 16.5	53.7 ± 20.3	54.8 ± 18.6	52.8 ± 8.3	54.3 ± 15.4
Games-based Active	77.5 ± 10.6	76.5 ± 16.6	86.2 ± 5.0	81.4 ± 12.5	77.7 ± 10.1	79.8 ± 7.2	79.8 ± 10.0
Transition	22.5 ± 3.4	30.6 ± 3.1	16.7 ± 7.3	24.6 ± 5.0	21.4 ± 7.4	16.8 ± 2.7	22.1 ± 6.6
Total Active	59.1 ± 4.9	55.0 ± 8.8	73.2 ± 8.9	60.0 ± 9.2	63.8 ± 6.6	69.2 ± 5.9	63.4 ± 8.6

5.5.2 Coaching behaviours

Altogether, 23,594 behaviours were coded across 2,926 minutes of practice time. **Table 5.4** displays the total, RPM, mean percentage, and mean duration of behaviours per session employed by academy coaches in practice sessions. Concurrent instruction was the most frequently employed behaviour (RPM = 2.39), followed by on-task silence (RPM = 1.90) and praise (RPM = 1.25), largely reflecting previous deductions that coaches interject with positive and instructional verbalisations between periods of silence (Cushion et al., 2012a; Stonebridge & Cushion, 2018). However, instruction behaviours made up 21% of an average session, which is lower than previous studies (Ford et al., 2010a; O'Connor et al., 2018; Partington et al., 2014). A low RPM but high mean percentage and duration for pre-instruction suggests that explanations of activities were lengthy. Whereas, concurrent instruction was typically comprised of many short cues and reminders of the task, or brief informative interjections (Smith & Cushion, 2006). Like many previous studies, concurrent instruction was the largest observed behaviour (Cushion & Jones, 2001; Feng et al., 2023; Partington & Cushion, 2013; Partington et al., 2014; Potrac et al., 2007). Questioning behaviours only made up a small component (3%) of an average session. However, coaches used divergent questioning to a greater extent than convergent questioning, supporting findings from O'Connor et al. (2018; 2022), but contrasting with some previous research (Partington & Cushion, 2013; Partington et al., 2014; Stodter & Cushion, 2019; Stonebridge & Cushion, 2018).

Positive forms of feedback (i.e., positive feedback, praise, positive reinforcement) were provided more frequently than negative forms of feedback (i.e., negative feedback, scold, negative reinforcement), also supporting previous research

Table 5.4 Behaviours employed by coaches (total behaviours, rate per minute (RPM), mean percentage of behaviours per session, duration of behaviours per session, and standard deviations).

Behaviour	**Total**	**RPM**	%	**SD**	**Duration (s)**	**SD**
Pre-instruction	951	0.45	8.10	4.00	298	180
Concurrent Instruction	4,922	2.39	9.46	3.49	340	177
Post-instruction	630	0.31	3.65	2.34	134	106
Instruction (Total)	6,503	3.14	21.21	3.04	772	109
Convergent Questioning	567	0.28	1.16	0.90	42	37
Divergent Questioning	773	0.39	2.04	1.62	73	74
Questioning (Total)	1,340	0.67	3.20	0.63	115	22
Positive Feedback	847	0.43	2.05	1.29	67	37
Negative Feedback	298	0.15	1.02	0.78	36	28
Corrective Feedback	405	0.21	3.02	2.92	99	79
Knowledge of Results	152	0.07	0.38	0.53	13	17
Knowledge of Performance	125	0.06	1.19	1.34	41	41

Table 5.4 Continued.

Behaviour	Total	RPM	%	SD	Duration (s)	SD
Praise	2,623	1.25	2.86	1.18	102	54
Scold	348	0.17	0.67	0.42	23	14
Positive Reinforcement	295	0.14	0.41	0.32	14	12
Negative Reinforcement	30	0.01	0.12	0.34	5	17
Feedback (Total)	5,123	2.49	11.72	1.09	400	37
Positive Modelling	188	0.08	1.25	1.34	48	62
Negative Modelling	46	0.02	0.23	0.28	9	11
Player Participation	113	0.05	1.11	1.28	45	56
Demonstration (Total)	347	0.15	2.59	0.55	102	22
Management	1,294	0.59	5.25	2.14	188	93
Colleague Interaction	491	0.22	4.38	3.99	163	156
Organisation (Total)	1,785	0.81	9.63	0.62	351	18

Table 5.4 Continued.

Behaviour	Total	RPM	%	SD	Duration (s)	SD
Silence – On-task	3,930	1.90	29.25	10.50	1,102	642
Silence – Off-task	717	0.32	8.97	5.65	336	250
Colleague Intervention	150	0.07	2.56	4.01	103	173
Silence (Total)	4,797	1.80	40.78	13.93	1,541	523
Hustle	1,167	0.58	1.65	1.25	59	48
Humour	486	0.26	1.65	1.57	53	40
Uncodable	2,046	0.97	7.55	7.14	261	214
Other (Total)	3,699	1.80	10.86	3.41	373	118

(Larkin et al., 2022; Partington et al., 2014; O'Connor et al., 2018). For example, the praise to scold ratio was 7.5 to 1, aligning with previous findings (Partington & Cushion, 2013; Potrac et al., 2002; 2007; Smith & Cushion, 2006). Praise was the most frequently used feedback behaviour, with coaches often implementing general forms of feedback to a greater extent than specific feedback (e.g., positive and corrective feedback). Positive modelling was the preferred type of demonstration, followed by player participation. Management was a frequently employed behaviour for allocating players into teams, organising equipment, keeping score, and indicating restarts within activities (Cushion et al., 2012a), while colleague interaction largely involved discussions of session-specific details with co-coaches.

Coaches were silent for approximately 41% of an average session. Although concurrent instruction was the most frequently used behaviour, on-task silence was observed for the longest duration within sessions. Therefore, coaches remained silent for large portions of the session, but interspersed interjections of instruction and praise throughout activities. The majority of silence was on-task, but approximately 9% of an average session was off-task. Despite attempts to reduce uncodable behaviours during pilot testing, they were observed frequently, making up nearly 8% of an average session. Upon further analysis of the behaviours within this category, a large proportion consisted of informal conversations with either players, other coaches, or parents that had no soccer-specific relevance.

Generally, observed behaviours did not significantly differ between age categories (see **Figure 5.1**). There were no significant differences between age categories for total instruction, questioning, organisation, silence and other behaviours (ps > 0.05). However, there was a significant main effect for feedback ($F_{5, 28} = 3.112$, $p = 0.023$) and demonstration ($F_{5, 28} = 4.173$, $p = 0.006$). For feedback, U-11 coaches

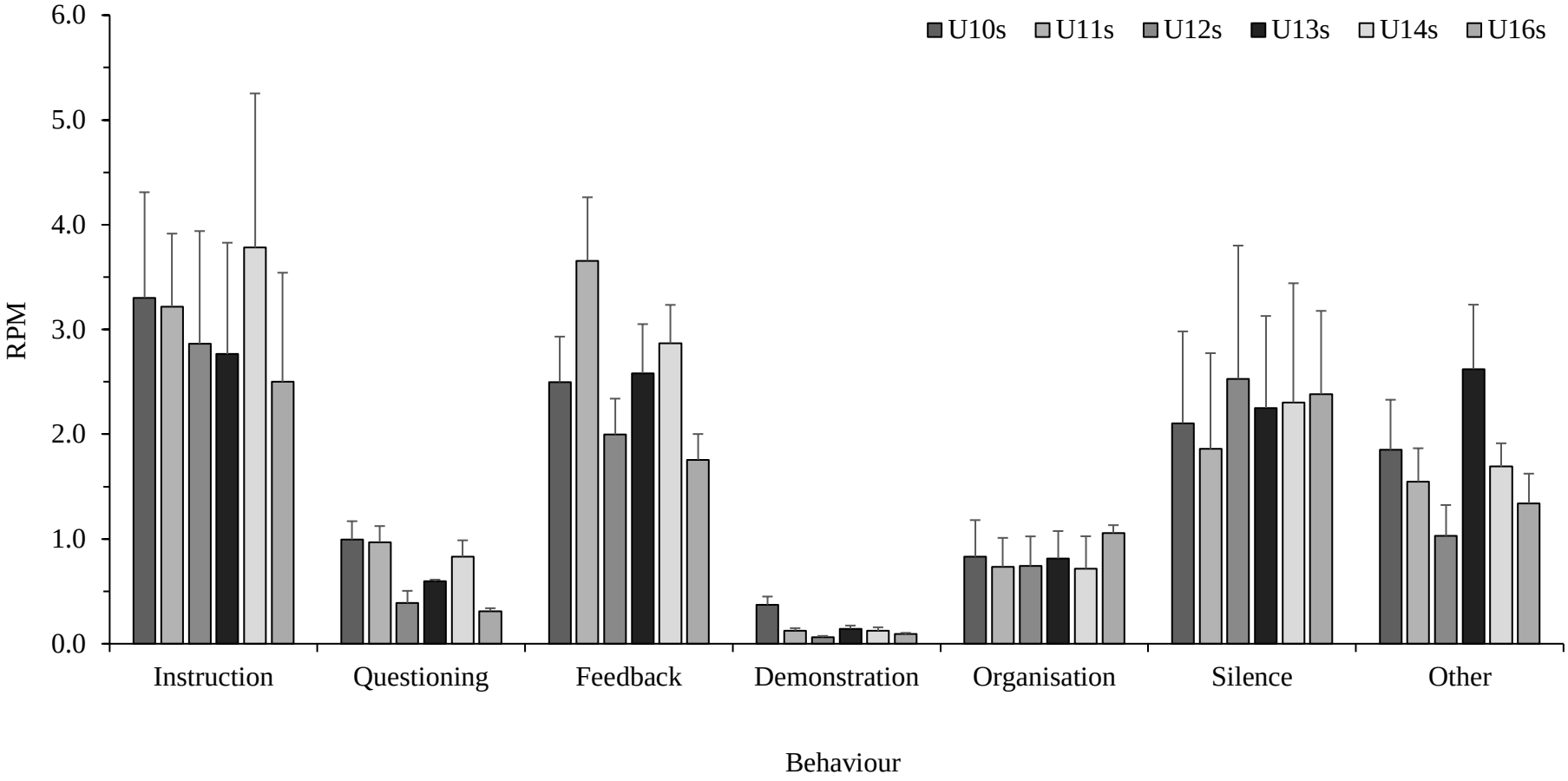

Figure 5.1 Mean rate per minute (and *SD* bars) of behaviours employed by coaches working within each age group.

had a higher RPM of feedback than U-16 coaches, although not significantly so (p = 0.051), and demonstration RPM for U-10 coaches was significantly higher than U-12, U-13, U-14 and U-16 coaches ($p < 0.05$).

5.5.3 Behaviour within activity types

A total of 6,245 (26.5%) behaviours were observed in drill-based activities, compared to 13,390 (56.8%) in games-based, and 3,959 (16.8%) in transition. The frequency of behaviours employed by coaches was influenced by practice state (see **Table 5.5**). Repeated measures ANOVAs revealed that concurrent instruction, positive feedback, praise, and on-task silence were all significantly higher in drill-based and games-based activities than in transition. Whereas, pre-instruction, convergent questioning, management and uncodable behaviours were all significantly higher in transition than in drill-based or games-based activities. Pre-instruction was used frequently in periods before activities and at the beginning of the session before the warm-up (O'Connor et al., 2018), whereas questioning was typically employed during the debrief of an activity, and management was used to organise the next activity (Stonebridge and Cushion, 2018). Informal conversations between coaches and players made up a large component of uncodable behaviours, particularly during transition periods. Scold and on-task silence were significantly higher in games-based than drill-based activities. For on-task silence, this was also highlighted in previous work (Ford et al., 2010a; Partington & Cushion, 2013; Stonebridge & Cushion, 2018), supporting the idea that coaches are less prescriptive within games-based activities. There was a preference for demonstrations in drill-based activities, suggesting modelling was used to show, correct, and refine technical skill. Hustle and praise were also used more frequently in drill-based activities, reflecting a positive but high-intensity component of the session.

Table 5.5 Rate per minute (RPM) of behaviours employed within practice activity states.

Behaviour	Drill-based	Games-based	Transition
Pre-instruction	0.41[a]	0.22[b]	0.96[a,b]
Concurrent Instruction	2.49[a]	3.12[b]	0.11[a,b]
Post-instruction	0.21	0.32	0.25
Convergent Questioning	0.15[a]	0.20[b]	0.50[a,b]
Divergent Questioning	0.22	0.37	0.45
Positive Feedback	0.26[a]	0.65[b]	0.06[a,b]
Negative Feedback	0.18	0.17	0.03
Corrective Feedback	0.20	0.24[b]	0.03[b]
Knowledge of Results	0.04	0.12	0.02
Knowledge of Performance	0.04	0.07	0.05
Praise	1.76[a]	1.47[b]	0.22[a,b]
Scold	0.13[c]	0.22[c]	0.08
Positive Reinforcement	0.09	0.14	0.17
Negative Reinforcement	0.00	0.01	0.03
Positive Modelling	0.15[a]	0.04	0.06[a]
Negative Modelling	0.04	0.01	0.01
Player Participation	0.07	0.03	0.05
Management	0.39[a]	0.35[b]	1.31[a,b]
Colleague Interaction	0.23	0.19	0.28
Silence – On-task	1.62[a,c]	2.75[b,c]	0.28[a,b]
Silence – Off-task	0.38[c]	0.09[b,c]	0.80[b]
Colleague Intervention	0.07	0.04	0.14

Table 5.5 Continued.

Behaviour	Drill-based	Games-based	Transition
Hustle	0.85	0.60	0.24
Humour	0.22	0.24[b]	0.34[b]
Uncodable	0.88[a]	0.81[b]	1.29[a,b]

Note:

[a] *significant difference between drill-based activities and transition*
[b] *significant difference between games-based activities and transition*
[c] *significant difference between drill-based and games-based activities*

5.5.4 Stimulated Recall Interviews

In total, 15 interviews were conducted with an average duration of 51.6 ± 7.1 min. Key themes, subthemes, and code groups from the thematic analysis are displayed in **Table 5.6**, with supporting excerpts presented in-text.

5.6 Discussion

The aim of this study was to explore the practice structures and behaviours used by youth coaches at an English female soccer club. A mixed-methods approach was adopted, involving systematic observations of practice sessions, followed by individual stimulated recall interviews during video feedback sessions to understand the rationale behind practice structure and behaviours. A reflexive thematic analysis of interview data resulted in 7 overarching themes: (1) Session structure and planning; (2) Activity types and purposes; (3) Managing transition periods; (4) Coaching behaviours and interactions; (5) Learning environment and philosophy; (6) Age-specific coaching approaches; and (7) Awareness and reflection.

Table 5.6. Breakdown of themes, subthemes, and code groups following reflexive thematic analysis.

Theme 1: Session structure and planning
Predetermined session structure
Session structure guided by coaching programme
Session structure informed by coach education
Theme 2: Activity types and purposes
Rationale for practice structure
Drill-based activities provide constant repetitive practice
Games-based activities develop perceptual-cognitive skills
Games-based activities relate practice to competition
Preference for games-based activities
Still a place for drill-based activities
Alignment with coaching philosophies
Advocated by coach education
Theme 3: Managing transition periods
Prolonged transition periods
Excessive proportion of session spent in transition
Causes of prolonged transition periods
Lack of intensity and hustle
Prolonged organisation of the session
Excessive informal conversations
Strategies to reduce transition periods
Efficient preparation
Efficient dual-coaching
Use of short drill-based activities
Remain on-task
Theme 4: Coaching behaviours and interactions
Balancing instruction and silence
Maintaining session intensity with instruction
Use of silence for observation and reflection
Silence is difficult to measure
Utilisation of questioning for learning
Questioning is a valuable learning tool
Convergent questioning used to check player understanding
Divergent questioning promotes player autonomy and problem solving

Table 5.6 Continued.

Provision of feedback
Positive over negative feedback
Specificity of feedback can be enhanced
Individual over group feedback
Theme 5: Learning environment and philosophy
Dual-coaching and coordination
Collaborative planning and coaching to maximise output
Dual-coaching ensures players are challenged appropriately
Dual-coaching could be managed more effectively
Intense and positive learning environment
Building intensity through hustle
Creating a positive learning environment
Building rapport with players
Theme 6: Age-specific coaching approaches
Adaptations to activity types
Adapting activities by age or ability
Adaptations to behaviours
Behaviours adapted as a function of player age
Theme 7: Awareness and reflection
Self-awareness of coaching practice
Low awareness of activities and behaviours
Informal reflection
Video feedback
CPD and improvement
Coach education
Learning from other coaches
Coaching is an Art
Art versus science of coaching practice

5.6.1 Theme 1: Session structure and planning

When planning and structuring their sessions, coaches adhered to a predetermined session structure that was guided by a coaching programme created and set by the academy director:

> *I'll read through the cycle guidance that's set by the technical director, work through our typical session structure, which is mastery, followed by duels, followed by practice around the topic and then game-related at the end.* (P1)

The academy director's influence ensured consistency in general session structure, although coaches had the freedom to design specific activities within these guidelines. Furthermore, coach education programmes delivered by the governing body (The FA) also informed session structures, and emphasised that players should be actively learning (i.e., ball rolling) for 70% of the session:

> *It comes from FA research, they were saying the research shows that you want the kids to be moving and playing 70% of the time and the coach talking or facilitating 30%. If it's the other way, it starts to become 'this is about the coach, not the player'.* (academy director - AD)

However, players were only active for 63% of an average session, with only one age category exceeding the 70% threshold. Within both drill-based (75%) and games-based (80%) activities, players were engaged and actively learning for large proportions of activities, suggesting time spent in transition between activities was the largest contributor toward inactivity.

5.6.2 Theme 2: Activity types and purposes

Across all age categories, coaches consistently prescribed a higher proportion of games-based (54%) than drill-based activities (24%), aligning with recent literature

(Fuhre & Saether, 2020; O'Connor et al., 2018; Roca & Ford, 2020; Stonebridge & Cushion, 2018) and skill acquisition recommendations (Williams & Hodges, 2005). However, this is in contrast to traditional session structures consisting of a predominant focus on drill-based activities (e.g., Ford et al., 2010a; Partington & Cushion, 2013). Drill-based activities were used selectively to develop specific technical skills within a repetitive practice environment:

> *I use [drill-based activities] to build fundamentals, it might be the ability to receive with an open body shape, or getting the correct technique when running with the ball. I think it's to get them having an understanding and feeling confident, doing it in a constant environment.* (P1)

The perception of using drill-based activities to develop and refine technical and movement skills has been evidenced previously (Andrew et al., 2021c; Stonebridge & Cushion, 2018). While this may result in immediate performance gains (Cushion et al., 2012a), it is difficult to replicate the dynamic environment of competition using blocked and constant practice conditions created in such activities (Ford et al., 2010a). Instead, coaches recognised that games-based activities provide opportunities to develop perceptual-cognitive skills that are essential for expert performance (Williams & Reilly, 2000), such as active decision-making, among a range of other perceptual-cognitive skills that interact continuously throughout performance (e.g. visual-scanning, pattern recognition, cue utilization, anticipation, problem-solving; Ford et al., 2010a; Williams & Ford, 2008):

> *If you do a drill-based activity, there's less decisions to be made and I think you want the players to have the freedom to make their own decisions and then reflect on them, whether it was a good decision or not. So I try to structure my practices to give them opportunity to do that.* (P3)

The dynamic nature of games-based activities promotes transfer of perceptual-cognitive skills such as active decision making from practice to competition scenarios, through a variable and random practice structure with increased contextual interference (Cushion et al., 2012a; Lee & Simon, 2004; Schmidt & Lee, 2005; Williams & Hodges, 2005). Coaches demonstrated limited understanding of this idea, instead suggesting that games-based activities simply relate practice to competition:

> *It depends on the topic because some are easier than others to do, but if you've got the numbers that allow, you're using half a pitch or a quarter of a pitch and you're doing it from a games-based activity because you're working on something that you want them to do in a game on Saturday.* (P13)

This explanation appears to suggest that coaches perceive player numbers and playing area as constraints for the adoption of games-based activities, yet research evidence suggests that a reduction in playing space and player numbers in small-sided activities or games can increase the number of technical actions per player, thus maximising the potential for learning to occur (Fernández-Espínola et al., 2020). Nevertheless, given the primary role of a coach is to assist players in acquiring the skills needed to perform successfully in competition (Ford et al., 2010a), it is promising to observe a large proportion of games-based activity provision in female soccer.

In conjunction with the above rationales, coaches expressed a clear preference for games-based activities. Although the value of drill-based activities was acknowledged, coaches emphasised that provision should primarily serve as a progression towards more dynamic games-based exercises:

> *I think there's a time and a place for drill-based things as long as we can have it within reason, to then progress on to the games as more of a stepping stone, rather than a whole component.* (P9)

This explanation aligns with the concept of scaffolding in educational theory, whereby simpler tasks build foundational skills (initial skill-mastery) that support progression to more complex and integrative activities, such as competition (Harvey et al., 2010; Partington & Cushion, 2013; Williams & Hodges, 2005). This approach is based on the assumption that drill-based activities break down skills into smaller isolated components to reduce the demands on attention during acquisition. As technical skill execution becomes more automatic, demands on the learner can be increased via progression to more complex drills or games-based activities by introducing opponents to challenge skill retention (Ford et al., 2010a; Schmidt & Lee, 2005). This idea was reflected by observation findings, with coaches prescribing drill-based activities at the beginning of sessions, before progression into games-based activities.

The preference for games-based activities aligned with both individual and club coaching philosophies. Supporting observation findings, all coaches demonstrated a natural preference for prescribing games-based activities:

> *For me as a coach, my view is games-based as well. So whenever I'm planning or delivering, I lean towards a games-based, realistic sort of practice.* (P11)

Concurrently, coaches highlighted the influence of the club coaching programme created by the academy director on the structure of their sessions:

> *It's on the [coaching programme] document that we use that we want it to be a games-based programme.* (P1)

Academy philosophies play a critical role in talent identification and development in youth soccer, significantly influencing recruitment and progression processes implemented by key stakeholders (Cushion et al., 2012). In the present study, the games-based philosophy of the academy director filtered through to practice via the coaching programme, and was naturally reinforced by their coach recruitment strategy that intentionally targeted games-based oriented coaches:

> *Subjectively, that probably influences the way you recruit when you bring the coaches in, you probably look at the coaches who have similar sort of theories and behaviours.* (AD)

Furthermore, coach education now advocates a games-based approach to coaching, which may have influenced findings (Ford & Williams, 2023). A similar effect was evident in Australian soccer (O'Connor et al., 2018), with the governing body encouraging the use of games-based activities via coach education programmes that they employ. In England, all coaches from male and female soccer undergo the same standardised coach education and training programmes led by the governing body, therefore it is unsurprising that such advocation of games-based activities within these programmes may have influenced the practice activities of coaches within the female game:

> *The majority of coaches will be more [games-based oriented] now because of changes in coaching philosophies and changes to The FA Youth modules which are more geared towards games-based.* (P12)

However, coach education programmes have not always been up to date with contemporary research (O'Connor et al., 2021). The slow pace (approx. one to two decades) at which research findings are incorporated into coach education to have practical impact and value has been highlighted (Cushion et al., 2012a). Nevertheless,

alignment of recent observational findings with contemporary coaching philosophies suggests a shift in youth coaching paradigms towards more dynamic and player-centred approaches, suggesting that recommendations from earlier research may have filtered through to coach education programmes, and are now influencing practice.

5.6.3 Theme 3: Managing transition periods

Many previous studies failed to account for transition periods within observations of practice sessions (O'Connor et al., 2018), despite coaches spending a significant portion of an average session (22%) in transition between activities. In the present study, transition periods were used to explain upcoming activities (pre-instruction), organise players and activities (management), or debrief following an activity (questioning), which are all important and necessary components of practice sessions whilst allowing players opportunities to hydrate and recover (Andrew et al., 2021c; Nédélec et al., 2012). Although transition has previously been labelled as wasted time by coaches (Stonebridge & Cushion, 2018), it can offer valuable learning opportunities, such as facilitating reflection and digestion of coaching points through the use of questioning (O'Connor et al., 2017). Both convergent and divergent questioning were most frequently employed by coaches during transition periods, reinforcing this concept (Stonebridge & Cushion, 2018). However, qualitative data revealed that some coaches did not acknowledge the potential quality of this time, focusing instead on its quantity and perceiving it as excessive:

> *I was surprised by the transition. I felt like, for how we manage the girls in terms of moving from one part of the session to the other, we don't spend that much time having a drink or whatever, but we do, so if we can get that transition percentage as low as possible is my big takeaway.* (P11)

Despite this, transition proportions varied across age categories, indicating that some coaches managed this time more efficiently than others. For those with higher transition periods, several explanations emerged. Firstly, a lack of intensity and inadequate session organisation often led to prolonged explanations of upcoming activities, thus increased inactive time for players. Observation findings supported this idea, with pre-instruction accounting for 8% of session time, yet coaches may not always be aware of this:

> *That's something I see with coaches as well, an explanation of a practice could take 4 minutes and you think, that's 4 minutes off your session time without realising.* (P7)

Additionally, setting up activities was time-consuming, exacerbated by the lack of help or absence of a co-coach:

> *I was coaching on my own so I had no help doing any moving. If I had another coach I would have done that a lot quicker.* (P6)

Finally, excessive informal conversations between players and coaches prolonged transition periods:

> *It's the balance of relationship building, like if you're having a bit of a joke with someone versus like 'right, we've had that now, we need to get on with it' because sometimes that exchange back and forth can end up taking a while.* (P7)

Informal conversations accounted for most 'uncodable' behaviours which were observed significantly more frequently during transition than in activities. Whilst these interactions could be viewed as important for building rapport with players, this

behaviour dominated transition periods for some coaches, therefore could indeed be described as wasted time (Stonebridge & Cushion, 2018).

Coaches who managed transition periods more effectively employed various strategies to minimise them. For example, efficient preparation, such as planning sessions in advance or setting up equipment proactively, allowed for smoother progression into the next activity:

> *Planning in advance helps, so less time moving things around and going from one session to the next. So can I have the next session ready to go so that I'm not having to pick a load of cones up and put them down for the next one.* (P3)

This process can be improved further via efficient dual-coaching. Coaches described utilising the co-coach for setting up the next activity whilst they addressed the group to explain it:

> *I might deliver the session content, and tell them how the session's going to work, while [co-coach] is setting up the last few cones.* (P12)

Whereas, when activity setup was more complex, the U-16 coaches reduced player inactivity by assigning players the role of setting up and managing short drill-based activities whilst coaches set up the next activity:

> *It was definitely intentional to reduce transition and to hit the four corner aspects like social. That was allocated to specific individuals so they could demonstrate some leadership. And more than the actual technical terms of the practice, it was so the ball was moving and they were chatting to each other while it was going on.* (P7)

This explanation is supported by activity findings, as the U-16 age category had one of the lowest average transition times, and highest drill-based activity proportions.

Therefore, this technique appeared to be particularly effective in reducing transition, keeping players engaged, and fostering autonomous learning in players. Lastly, increasing the intensity during breaks using hustle behaviours and intentionally minimising opportunities for informal conversations helped to reduce transition duration:

> *I can get them in quick. I may say silly things like 'last one in smells', but it gets them in.* (P9)

Adopting such strategies were effective in reducing transition and player inactivity, and offer practical solutions for more effective transition management in practice sessions.

5.6.4 Theme 4: Coaching behaviours and interactions

Consistent with prior research (Clements & Meyler, 2017; Feng et al., 2023; Potrac et al., 2002; Stonebridge & Cushion, 2018), both instruction and silence were frequently observed coaching behaviours. High amounts of instruction typically indicate a prescriptive coaching approach, while significant periods of silence suggest a more 'hands-off' approach (Partington & Cushion, 2013; Ford et al., 2010a; Williams & Hodges, 2005). This variance may reflect the diverse individual coaching styles present within the club:

> *I think some coaches have different defaults. Some will speak and think 'right, it's not working, I need to go in and solve it' where sometimes I'll think 'oh, it's not working now', and just stop and watch it and think before going in*. (P7)

However, coaches expressed uncertainty of the optimal balance between instruction and silence, and voiced concerns that excessive silence could reduce session intensity,

which is often built and maintained through interjections of concurrent instruction (Stonebridge & Cushion, 2018):

> *If you try and [be silent] during the session, I feel like the session intensity drops a little bit and then ball rolling time can as well, it's just trying to get the balance.* (P12)

The academy director reinforced this point, emphasising the critical but challenging nature of balancing instruction and silence:

> *If you don't talk, the intensity drops and they might lose focus, but if you're talking all the time, do your coaching points get lost because it's just background noise? The key question is how do you talk less but maintain high impact and intensity? Because I think the fear for all the coaches is 'well if I don't talk, they're just going to mess around' or 'they're not going to train at the right intensity' or 'the standards will drop'.* (AD)

Excessive instruction, particularly concurrent, may overload players with information, inhibit engagement in problem-solving and decision-making, and disrupt automatic motor processes, leading to inefficient retention and transfer (Ford et al., 2010a; Hodges & Franks, 2004; O'Connor et al., 2018). This overload is suggestive of the academy director's notion of 'background noise'.

Despite these concerns, coaches were silent for a large proportion of the session (41%), a rate considerably higher than observed in earlier studies (10-16%; Cushion & Jones, 2001; Potrac et al., 2002; 2007), suggesting a much less prescriptive approach in comparison. Similar to those observed by Stonebridge & Cushion (2018), some coaches claimed to use silence strategically as a deliberate and conscious technique to observe and reflect on the session:

> *I think [silence] allows coaches time to digest what's actually happening and allows players to bed into the session, make mistakes if need be, or find their own way of success.* (P1)

This approach is indicative of a guided-discovery coaching style, whereby reflection and observation promote implicit learning in players by facilitating opportunities for autonomous engagement, discovery and problem-solving (Larkin et al., 2022). However, the intention behind periods of silence is challenging to ascertain (Ford et al., 2010a), as highlighted by one coach:

> *I think silence is powerful if you know someone is doing it intentionally, but how do you know if they're silent because they're just watching and they've got nothing going on in their minds, or whether they've seen something and not commented on it?* (P7)

Intentional silence is associated with reflective thought processes directly related to the activity, allowing players to engage in problem-solving and self-discovery (Smith & Cushion, 2006), whereas unintentional use of silence may be perceived as a lack of competence or experience (Potrac et al., 2007). Nevertheless, research has recommended fewer but more meaningful interjections of instruction and feedback during periods of silence, however the practical application of these recommendations remains a concern for some coaches. The challenge lies in balancing instructional input to maintain session intensity without diminishing opportunities for autonomous learning. This delicate balance is critical for fostering an environment conducive to both learning and performance.

Questioning players is a technique used to facilitate active learning through problem-solving and discovery (Chambers & Vickers, 2006; Feng et al., 2023; Harvey et al., 2010; Partington & Cushion, 2013). In the present study, one coach emphasised

questioning as a powerful pedagogical tool and intervention strategy (O'Connor et al., 2018):

> *I'd like to be quite powerful with questioning, allowing time for players to actually think about it, but then going back and making sure that there's been learning in there, rather than just leaving them with it.* (P7)

This approach underscores the potential of questioning to foster reflective thinking and reinforce learning (Partington et al., 2014). Regarding the distinct types of questioning, coaches used convergent questioning to verify player understanding, directing responses towards specific, predetermined answers depending on what the coach perceived to be important (O'Connor et al., 2021; Stodter & Cushion, 2019; Stonebridge & Cushion, 2018):

> *I ask those questions when it's just yes or no just to re-emphasise points, because you need to make sure they remember that.* (P8)

Whilst this method was used to ensure key points were reinforced and retained by players, coaches used divergent questioning to stimulate deeper thinking and promote player autonomy, problem-solving, and critical thinking (Cope et al., 2016; Harvey & Light, 2015; Partington & Cushion, 2013):

> *I want the players to think and assess the problem themselves. It's no good me just saying 'this is what the problem is, how do you find the solution?', you've got to go 'why is this a problem?'. If they understand why it's a problem, then they're more likely to look for a solution.* (P3)

Unlike many previous studies (O'Connor et al., 2021; Partington & Cushion, 2013; Partington et al., 2014; Stodter & Cushion, 2019; Stonebridge & Cushion, 2018), a higher ratio of divergent to convergent questioning was observed, indicating that

coaches are questioning more strategically (Larkin et al., 2022). However, overall use of questioning was generally lower than previously reported (O'Connor et al., 2018; 2021; Stodter & Cushion, 2019; Stonebridge & Cushion, 2018). Coaches may benefit from pre-planning questions to use during activity debriefs within transition periods (O'Connor et al., 2017; 2021), which are currently dominated by informal chat between players and coaches. Structured questioning can transform transition periods into valuable opportunities for learning and reflection, further integrating questioning as a core component of the coaching process.

Feedback provision accounted for 12% of total behaviours within an average session. Coaches predominantly provided a higher proportion of positive feedback behaviours than negative, aligning with previous research (Partington et al., 2014; O'Connor et al., 2018). Providing praise to players was a prevalent behaviour, and is recognised to enhance self-esteem, confidence, and motivation (O'Connor et al., 2018). The academy director highlighted the receptiveness of female youth players to praise:

> *Using praise is motivational, and it definitely works within the girls environment.* (AD)

However, they expressed concern that an overly positive approach may hinder player development:

> *They talked about being positive, but I can put a clown in front of them and they will be positive, enthusiastic, and fun, and the girls would have an amazing time, but they wouldn't become better footballers. It's an integral part of the cake, but if it's 100% of the cake, then you have very excitable girls, who aren't learning or developing or improving.* (AD)

This concern was reflected by the infrequency of scold behaviours observed throughout the academy. One coach emphasised that the high quality of the players diminished the need for this behaviour:

> *With the standard [of players], we're probably not going to have to scold that much.* (P10)

Previous research provides support for this idea, highlighting that scolding is typically employed to address poor athlete performance (Clements & Meyler, 2017), or to remove mistakes (Partington et al., 2014). Instead, coaches favoured the provision of more positive forms of feedback.

General positive feedback, while motivational, is less effective for performance improvement compared to specific feedback (Larkin et al., 2022; O'Connor et al., 2018). An example from a video feedback session revealed that specificity of feedback could be enhanced:

> *This is around body shape, but actually the real feedback is 'can we be side on' or whatever is the body shape you want. You're just shouting 'body shape'. You're telling them the outcome but are you helping them with it? 'It needs to be slightly further bent' or 'are you checking your shoulder?'. It's really like that more specific level of feedback.* (AD)

Converting general praise into specific feedback would ensure that players are still motivated, but also provides higher quality interjections of augmented feedback. A primary purpose of augmented feedback is to highlight areas for improvement to enhance performance in subsequent practice attempts (Williams & Hodges, 2005). Skill acquisition theory asserts that encouraging players to depend on their own task-intrinsic feedback mechanisms develops their problem-solving and self-correction abilities, which are crucial during competitive situations when specific external

feedback from the coach is less readily accessible (Anderson et al., 2019; Salmoni et al., 1984; Williams & Hodges, 2005). Consequently, a 'less is more' approach has been recommended for benefits to retention and skill acquisition (Anderson et al., 2019; Otte et al., 2020). Further research recommendations include the provision of individual over group feedback to address specific player needs and maintain active session time. For example, coaches often pause sessions for the group using 'freeze' or 'huddle' interventions, which contribute to inactivity (O'Connor et al., 2018). Coaches must discern when feedback is relevant to the entire group or only for individual players, and act accordingly (O'Connor et al., 2021). This strategy is now advocated by coach education programmes (Stodter & Cushion, 2019), and coaches in the present study recognised its benefits:

> *Sometimes it's not always relevant [to the group]. If it's a team thing like a set piece then it is for them to notice and see, but if it's just something like 'actually you could have turned out there', you don't need to stop and say 'what could [player] have done here?', and then see if that person can go back in and affect the game with what we've said.* (P13)

Moreover, providing delayed feedback allows players to process and evaluate intrinsic feedback themselves (Larkin et al., 2022), preventing the over-correction of mistakes as a result of immediate augmented input by coaches (Cushion et al., 2012a; Otte et al., 2020; Williams & Hodges, 2005). By balancing positive interactions with specific, actionable feedback and strategically timing these interventions, coaches can enhance player development while maintaining motivation and engagement.

5.6.5 Theme 5: Learning environment and philosophy

The academy director's strategy to assign two coaches per age category aimed to harness the advantages of dual-coaching. This approach, however, was implemented with varying degrees of effectiveness across age categories. Effective dual-coaching was marked by collaborative planning and alternating lead roles to maximise output from coaches. One coach underscored the importance of clarity in this approach:

> *So when [co-coach] is doing something, I want to be really clear on what the purpose is, what the outcome is, so that I can then still impact that session, rather than 'right, [co-coach] is leading this bit now so I'll stand here for 15 minutes'.* (P7)

Dual-coaching was generally effective in addressing both group and individual needs and ensuring each player was appropriately challenged. Individual differences within a group of players can make it difficult for coaches to challenge each player appropriately (Williams & Hodges, 2023), particularly in female soccer, given the diverse range of technical abilities within groups (Gledhill & Harwood, 2015). Within the present study, coaches described leveraging dual-coaching to better tailor challenges to individual players:

> *I think that's really an important thing, thinking about how to challenge those individuals, and that's only going to be better if I communicate in advance with the co-coach, who may want them to be challenged a certain way.* (P14)

However, some coaches experienced challenges in managing dual-coaching effectively, expressing frustration when their co-coach did not actively engage:

> *I send him over my session, and I'll put co-coaching in there, but it's whether he takes it up or not. I know he likes to stand back and watch and assess the girls, and I just crack on. But sometimes I need him, but if he doesn't want to do it, he doesn't want to do it.* (P9)

This highlights the necessity for mutual engagement and commitment in dual-coaching arrangements to ensure effectiveness. Despite the challenges, these findings suggest that with competent implementation, dual-coaching can be a valuable tool in meeting diverse player needs and promoting a higher level of individualised coaching.

Coaches valued an intense and positive learning environment for players. Session intensity was primarily built and maintained through hustling behaviour, which resulted in a higher observed RPM (0.58) compared to previous studies (Feng et al., 2023; Partington & Cushion, 2013; Partington et al., 2014; Stonebridge & Cushion, 2018). Hustling can be used to apply pressure to players to improve decision-making under time constraints (Feng et al., 2023), and intensity built through hustling was described as a key component of individual coaching philosophies:

> *Intensity is a massive part of what I want to see in players and on the pitch, just down to that core ethic of hard work, really.* (P1)

In addition to intensity, coaches also aimed to create a positive learning environment characterised by high amounts of praise and low amounts of scold (Partington & Cushion, 2013; Potrac et al., 2007):

> *I try and create a positive learning environment for the players. I think that's really important. I think building rapport is one of my strong points as a coach and I think if you're going to ask players to work with intensity and quality and have high demands, you've got to have that relationship with them.* (P1)

A supportive coach-player relationship was created using humour, informal conversations and positive interactions, which can increase receptiveness to feedback and intensity (Cushion & Jones, 2001). The academy director emphasised the importance of building rapport with players:

> *I look at things like rapport. Can they build a rapport with the young people? There's a million coaches out there with great qualifications but actually can't get the message across because there's no rapport there. So rapport, communication skills are really, really important.* (AD)

This underscores the idea that technical skills alone are insufficient for successful coaching; strong interpersonal skills are equally critical. Coaches who can balance high demands with strong interpersonal relationships are likely to create more engaging learning environments for players.

5.6.6 Theme 6: Age-specific coaching approaches

Coaches suggested that they would adapt practice activities as a function of player age, claiming that younger age groups should receive a greater proportion of drill-based activities, whereas older players are expected to have refined technical skills and therefore require fewer drill-based activities:

> *I do think there's a place for drill-based activities, especially at younger ages. It might even become a little more drill-based in the younger ones because when you get to age 14, you expect them to have most of the technical side, whereas they're still finessing it at a younger age.* (P13)

However, observations did not support this idea, showing no significant differences in drill-based or games-based activity provision across age categories. In contrast, some coaches asserted that adapting activity proportions should be dependent on ability rather than age:

> *I don't think it's dependent on age, I think it can be dependent on the ability. So I could get the girls to do something because they're technically able to do it.* (P5)

Despite the disparity between awareness and provision of practice activities, it is positive that players across all age categories received a higher proportion of games-based activities. The connections between perceptual, cognitive and motor skills are thought to be established early in development, therefore exposing younger players to games-based activities will help develop the skills and interconnections needed for performance in competition (Ford et al., 2010a). Therefore, a more nuanced approach may be needed, that considers both age and ability of players.

Coaches also reported adapting their behaviours as a function of age. Observations revealed that younger players received more feedback and demonstration behaviours than older players, though similar to Ford et al. (2010a), provision of instruction did not change as a function of age. Partington et al. (2014) suggested that use of instruction was higher in younger age categories, due to younger players having insufficient knowledge and therefore requiring more guidance from the coach. However, in the present study, coaches described adaptations to the language they used when instructing, rather than the quantity of instruction:

> *So the language would change, like the way you would give instruction. I'd break it down, you have to strip it back and start at the basics. For younger ages, there would also be a lot more demonstration.* (P13)

For younger players, coaches would adopt a more enthusiastic tone to facilitate player understanding, and simplify their communication style by modifying instructional language rather than the amount of instruction.

5.6.7 Theme 7: Awareness and reflection

Coaches often exhibit low awareness of behaviours employed during practice sessions (Cope et al., 2022; Harvey et al., 2013; Partington & Cushion, 2013; Raya-Castellano et al., 2021; Stonebridge & Cushion, 2018). This lack of self-awareness was initially evident in the present study, with coaches acknowledging their tendency to focus on the session itself rather than their own behaviours:

> *I'll focus on the session more than on my own behaviours. I would reflect on my behaviour after.* (P8)

The issue of low awareness limits the ability of coaches to understand the implications of their behaviours during sessions (Cushion, 2010) and may be compounded by the use of informal and superficial reflection techniques (Downham & Cushion, 2022), with coaches often reflecting on the drive home post-session:

> *I think 'right, that went well today, I probably could have done better with that'. Even with classroom sessions and one-to-ones with players, that time in the car on the way home, I'll reflect on it for a good half an hour.* (P12)

Such informal reflection techniques may limit self-awareness and inhibit meaningful improvement. Critical reflection can enhance awareness (Cushion, 2010), but requires adequate time and consistent practice (Knowles et al., 2001). Time constraints were cited as a significant barrier to engagement in thorough reflection, however individualised video feedback emerged as a valuable tool for increasing self-awareness of behaviours implemented during practice sessions:

> *I think this is one of the most useful pieces of feedback that I've come across as a coach because it's individualised to myself, it's specific, it's objective, there's no bias behind it. Just being able to see what my behaviours look like on a fairly consistent basis then enables me to ask the right questions of what I'm doing in practice.* (P1)

This perspective aligns with previous research, highlighting the efficacy of video feedback sessions for improving self-awareness and providing a more personalised learning experience for coaches (Andrew et al., 2021c; Raya-Castellano et al., 2020).

In addition to reflection, coaches employed various techniques to inform their practice, including engagement with coach education courses and progression through qualifications provided by the governing body (Partington et al., 2015; Smith & Cushion, 2006). Although, some coaches felt these courses often lacked the provision of specific individual feedback compared to insights gained from video feedback:

> *Some of those courses are a bit generic too. Obviously they have to cater for all the coaches, so it is generic but there's little snippets you can take from it*. (P11)

Therefore, while formal coach education is beneficial, it may not fully address the needs of each individual coach. Learning from other coaches through observation, discussion, or mentoring was also popular and perceptually beneficial, allowing coaches to *'pick up different things'* and integrate new strategies, ideas and approaches into their own practice (Cushion et al., 2012a; Partington et al., 2015; Van Woezik et al., 2021):

> *We steal different things and mould them into our own vocabulary and book of tricks. I'll see what they didn't do that well or what they could have done better, and then think, 'oh, so when I'm delivering, I might do it this way'*. (P11)

However, a reliance on observational learning over evidence-based recommendations may perpetuate the emulation and reinforcement of outdated knowledge and behaviours that are negatively associated with player learning and development

(Cushion et al., 2012a; Ford et al., 2010a; Partington & Cushion, 2013; Williams & Hodges, 2005), and should be approached with caution.

Balancing the science and art of coaching was also emphasised. Research evidence can improve player learning and development, and some coaches appeared to be receptive to this:

> *And I do get science, so I am more of a science than an art person. So if you came and said to me 'this is what's best', then I'll listen.* (P13)

However, coaching was also perceived to be an art, involving relationship-building with players and developing natural coaching styles:

> *Although we're doing a lot of science here, fundamentally, coaching is an art and it's how we craft it as coaches and use this to improve and have CPD. But for me, the best coaches, it's an art and it's how you build the rapport with players and get the best out of them.* (AD)

While evidence-informed practice is critical for player development, altering natural coaching styles should be approached with caution to maintain coaching fluidity. Since behaviours alone are not holistically indicative of effective coaching practice (Cushion et al., 2012b; Douge & Hastie, 1993; Stonebridge & Cushion, 2018), flexible and dynamic coaching styles may be merited over a 'one approach fits all' system. Moreover, although guidelines exist for improving practice activity design and coach verbalisations during sessions, the optimal quantities of these aspects remain unclear. Nevertheless, there are certain premises that coaches should aim to incorporate into their practice based upon research evidence, such as prioritising quality over quantity of feedback and instruction, games-based over drill-based activities, and minimizing unnecessary behaviours and inactive practice time to increase session efficiency.

5.7 Chapter summary

This study investigated the microstructure of practice activities and behaviours employed by coaches within English female youth soccer, yielding several important implications for coaching practice, player development programmes and coach education. In line with recommendations from skill acquisition research, coaches deliberately structured their practice sessions to incorporate a larger proportion of games-based than drill-based activities to maximise opportunities to develop perceptual-cognitive skills in players. This approach was consistently observed across all age groups, with some coaches suggesting practice structure should be adapted based on ability rather than as a function of player age, indicating a nuanced understanding of player development. However, the challenge of maintaining player engagement and minimizing inactivity during transitions emerged as a critical area for improvement. Effective management of these periods can be achieved with thorough preparation, collaboration and coordination with co-coaches, and strategies to reduce opportunities for informal, non-soccer-specific interactions. For example, coaches could employ divergent questioning during transitions to reinforce learning and keep players mentally engaged. The study also highlighted the complex interplay of coaching behaviours, particularly the balance between instruction, praise, and silence. While some coaches preferred a prescriptive approach, others leaned towards a more hands-off guided discovery method, reflecting varied coaching styles. The challenge of balancing instruction and silence was evident, with excessive silence potentially lowering session intensity, and too much instruction risking cognitive overload for players. Coaches could facilitate autonomous learning by encouraging players to drive intensity in practice sessions themselves, particularly in older age categories, allowing

the coach to observe and reflect on the session and provide meaningful and quality interjections of augmented instruction or feedback when required.

Notably, there did not appear to be any significant variations in rationales for practice activities and behaviours in comparison to previous research on male soccer. This suggests that player gender may not be a major factor influencing practice structure or coach behaviours. Instead, these findings appear to be shaped more by coach education and the specific environment created and modulated by the academy director (i.e., coaching programme, philosophy, and recruitment strategy) that emphasised games-based activity provision. Therefore, given the case study approach, it may be challenging to generalise findings to other youth structures throughout the English female soccer pyramid. A limitation of the present study may arise from the overt nature of observations. Since coaches were aware they were being observed, behaviours may have been adapted or improved, potentially impacting validity. This phenomenon was discussed with the academy director, who suggested that the potential extent of this issue on findings was minimal as they largely reflected what they anticipated, though they perceived that any improvements to coaching behaviour would naturally be beneficial for players. Despite such limitations, this study provides valuable insights into contemporary coaching practices in female youth soccer and affords practical recommendations for improving session efficiency and effectiveness. With continued emphasis on games-based activities and a player-centred approach, coaches can significantly enhance the developmental experience of young players. Future research could explore the impact of these practices in different contexts, understand such issues from a player perspective, and examine how coach education can further support the implementation of effective coaching strategies.

6 Epilogue

6.1 Chapter overview

This chapter aims to provide a comprehensive summary and synthesis of the research presented in this thesis, positioning it within the wider discourse on talent identification and development in female soccer. Additionally, it will discuss the practical implications of the findings, offer applied recommendations to enhance talent identification and development processes, and highlight potential avenues for future research. These insights are intended to support the ongoing evolution of talent pathways and contribute to the continued growth and development of the female game.

6.2 Evaluation of thesis aims

The primary aim of this thesis was to examine the talent identification and development pathways that current female youth players in England progress through, and to evaluate the impact of these pathways on their skill acquisition and overall development. With the recent professionalisation of the top two league tiers, success at the senior international level, various structural changes at youth level, and the continued national growth of the female game, it became imperative to explore the existing talent identification and development landscape. As a result, this thesis pursued three overarching objectives: (1) to explore talent identification and development practices of female academies in England; (2) to analyse the engagement patterns of female soccer players along the English talent pathway; and (3) to examine the microstructure of practice activity design and coaching behaviours within academy coach-led practice sessions.

An overview of the research questions, methodology and outcome measures of each study are presented in **Figure 6.1**. Study One (Chapter Three) addressed objective (1) of the thesis. The aim was to understand the structure of female youth academies and identify the processes and characteristics that influence talent identification, talent development, and deselection in academies affiliated to clubs in the top three league tiers of England. This was achieved through a 31-question online survey distributed to 26 academy directors. This study examined structural characteristics of academies, such as the number of registered players and the presence of departments (e.g. sports science), explored the aims and objectives of talent identification and development, evaluated the role of staff members in player recruitment and development, and discussed challenges faced by academies.

Study Two (Chapter Four) centred on objective (2), examining the developmental participation histories of 34 female academy players. Through a retrospective questionnaire, the study investigated key soccer milestones achieved by players, the quantity of engagement in soccer and other sport activities throughout development, and player perceptions of enjoyment, motivation, physical challenge, and cognitive challenge within coach-led practice, individual practice, peer-led play, and competition. Comparisons were made to previous published work on professional players from England (Andrew et al., 2024a), further contextualising the findings.

To gain a greater understanding of the quality of engagement along talent development pathways (Baker et al., 2020), Study Three (Chapter Five) centred on objective (3), using a mixed-methods design to analyse the microstructure of practice activities and implementation of coaching behaviours in situ within an English female soccer academy. A case study approach was adopted, involving 14 coaches and the academy director from a single club. Specific study objectives involved a

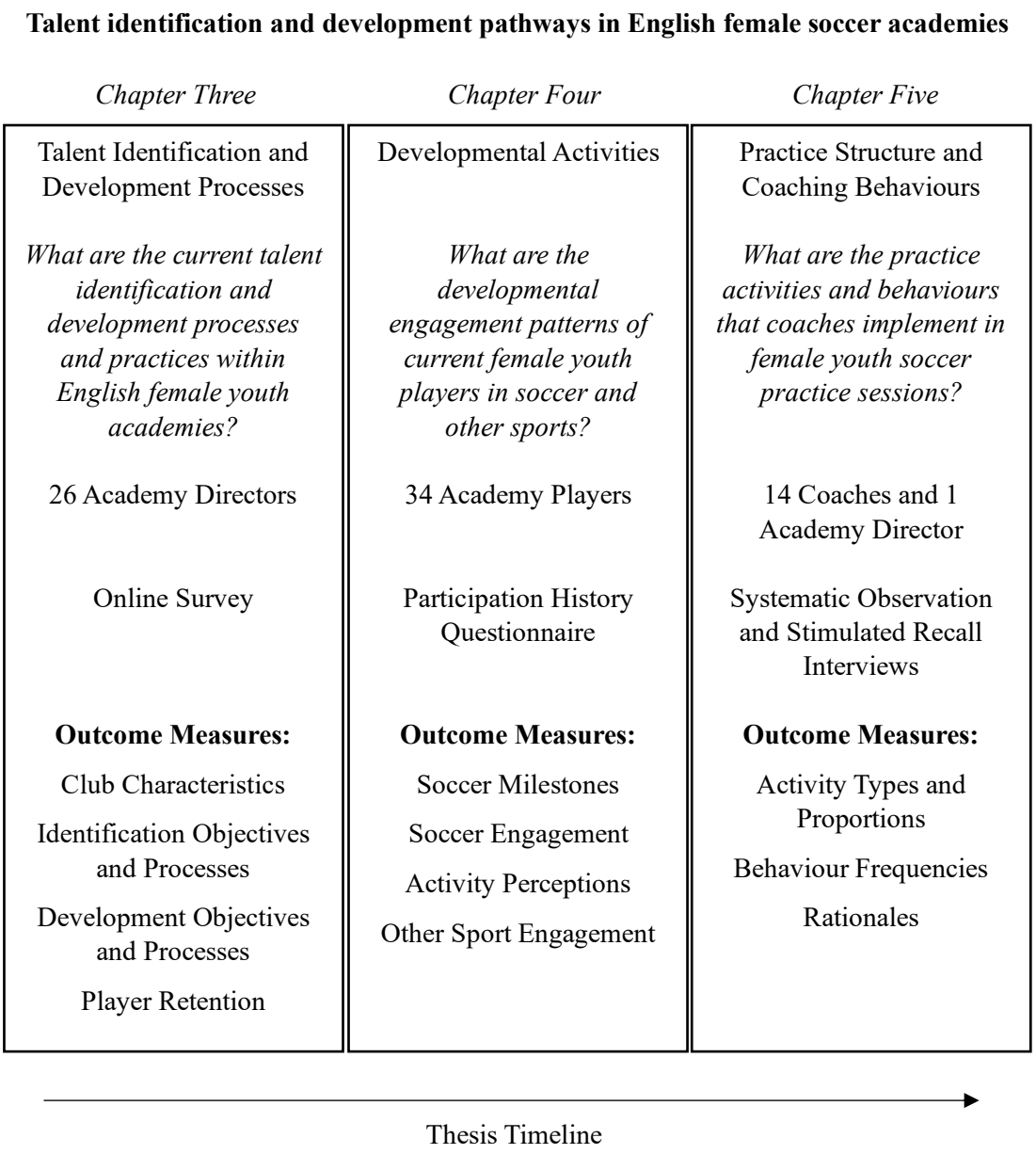

Figure 6.1 Overview of the research design, methodology, and outcome measures across each thesis chapter.

systematic observation of coach-led practice sessions to assess the design, structure, and activity types (i.e., drill-based and games-based), along with the coaching behaviours utilised by coaches during sessions. Additionally, semi-structured stimulated recall interviews were conducted as part of video feedback sessions to

explore the rationale behind activity design and coaching behaviours, linking current practices to research recommendations for best practice.

This thesis adopted a broad-to-narrow focus: starting with an investigation of the wider talent identification and development landscape in English female soccer, and transitioning to a more focused and detailed examination of specific processes within this landscape. In relation to these objectives, key findings from each research study are summarised in the following sections.

6.3 Summary of key findings

6.3.1 Chapter Three – Study 1

Findings from Chapter Three offer novel and contemporary insights into the youth structures of female soccer academies in England, with a focus on talent identification, development, and deselection processes. Analysis of club structure and characteristics revealed that only 19% of clubs reported having dedicated recruitment departments within their academies. This finding contrasts significantly with male youth soccer, in which recruitment staff operate from local to international levels, identifying talent across all developmental stages from 8-21 years, at a part-time to full-time capacity (Ford et al., 2020b; Reeves et al., 2018a). This lack of specialised recruitment departments and staff in female academies suggests that talent identification is considerably less refined in comparison to male soccer, potentially hindering player selection processes. Further support for this idea was provided via assessment of the processes themselves. Indeed, talent identification across all clubs largely relied on observations during trials by coaches and academy directors, who were responsible for selection and deselection decisions. While identification processes such as

medical, physical, and performance assessments became more multifaceted at higher age groups and in clubs from higher league tiers, there was a notable lack of multidisciplinary components in lower-tier academies.

Key talent development processes included frequent competition and practice sessions, of which the latter was characterised by small-sided games, as well as drill-based, games-based, and fitness activities. Whereas, processes including strength and conditioning, nutrition, psychological, and educational support were all more prevalent in higher-tier academies. Considering the reduced financial constraints faced by these academies in comparison to those from lower league tiers, and a more multidisciplinary approach to talent development, academies from higher league tiers were able to produce a higher proportion of homegrown players for their senior team. Additionally, academies prioritised the collection of data related to physical and skill attributes, with little focus on psychological or sociological factors, raising concerns about potential selection biases associated with early maturation (Williams et al., 2020). Player turnover rates were higher (39%) than in male academies (25-30%; Ford et al., 2020b; Güllich, 2014), though this may be attributed to a larger player intake than loss, reflecting the growth of youth structures and increased popularity of female soccer in recent years. Nevertheless, clubs primarily experienced player losses due to competition from other clubs, or due to player deselection for not meeting progression criteria. In summary, the findings indicate that youth structures are expanding, but also highlight limited talent identification processes and a lack of multidisciplinary approaches in female soccer academies, potentially hindering player development and selection, particularly in lower-tier academies.

6.3.2 Chapter Four – Study 2

Chapter Four examined the developmental participation histories of youth players navigating the English talent pathway. Although prior studies have explored the engagement profiles of professional players (Andrew et al., 2024a; Ford et al., 2020a; Güllich, 2019; Hendry et al., 2019a), this study focused on players currently developing within the restructured English talent pathway, reducing the risk of errors associated with retrospective recall and reflecting the unique experiences shaped by these recent within-nation changes. Youth players began participation in soccer at an early age (5-6 years), aligning with findings from professional samples. However, players entered academy environments notably earlier (~10 years) in comparison to professional players (~12-15 years; Ford et al., 2020a; Hendry et al., 2019a), including those from England (Andrew et al., 2024a), reflecting earlier provision of elite development programmes within England. These players also accumulated more hours in soccer activities (~5,600 hours) throughout development than professional players from England (~3,500 hours), despite still progressing through their youth careers.

Childhood soccer engagement was initially characterised by informal, peer-led play activities (i.e., play-type games with rules created and supervised with peers; Andrew et al., 2024a; Ford et al., 2010a) and mixed-gender participation. However, this transitioned into more formal, coach-led practice (i.e., structured group practice supervised by coaches; Andrew et al., 2024a; Ford et al., 2010a) and competition (i.e., organised match-play) activities in adolescence within female-only teams. These significant increases coincided with entry into an academy development environment, whilst engagement in peer-led play subsequently decreased significantly. Players rated all activities across development as highly enjoyable and moderately to highly motivating, whilst perceptions of physical and cognitive challenge increased

significantly from childhood to adolescence in all activities other than informal play. Variations in developmental pathways towards senior level were also evident, with 44% of players specialising early, characterised by participation solely in soccer from early childhood to maximise practice opportunities (Côté et al., 2009). Whereas, the remaining 56% displayed evidence of a diversified sporting experience, involving the sampling of a variety of sports throughout development in addition to soccer (Côté et al., 2003; 2007; 2009). However, given the early start age in soccer, and domain-specific engagement in childhood soccer play and practice, findings appear to be most commensurate with the early engagement pathways towards expert performance, characterised by ample engagement in soccer practice and play from an early age, and not to the exclusion of participation in additional sports (Ford et al., 2009; Hendry & Hodges, 2018; 2019). Taken together with the early engagement hypothesis, Chapter Four highlighted key differences between current youth players and professional players (Andrew et al., 2024), particularly regarding earlier exposure to an academy environment, which reflects the ongoing structural changes within English female youth soccer.

6.3.3 Chapter Five – Study 3

While Chapters Three and Four emphasised the importance of practice activities in player development, Chapter Five offered original insights by providing an in-depth analysis of practice structure and coaching behaviours within the female soccer context. Systematic observations of practice sessions revealed that coaches consistently structured their sessions to incorporate a greater proportion of games-based than drill-based activities, across all age categories. This structure offers players greater opportunities to develop perceptual-cognitive skills (e.g., anticipation, visual-

scanning) that are more readily transferable from practice to competition (Roca & Ford, 2020; Williams & Reilly, 2000). During stimulated recall interviews, coaches attributed their practice design to factors such as coach education, the coaching programme developed by the academy director, and their own personal coaching philosophies. However, transitions between activities accounted for 22% of session time, which both coaches and the academy director viewed as excessive. Suggested strategies to reduce these transition periods included more efficient preparation, utilisation of dual-coaching, and maintaining focus throughout sessions.

Coaching behaviour observations highlighted variations in coaching styles from a prescriptive to a guided-discovery approach, with high instruction, praise, and silence behaviours observed frequently within sessions. Coaches cited difficulty in balancing instruction with periods of silence, expressing concern that reductions in instructional verbalisations during activities in favour of silence would reduce session intensity. The case study methodology, and collaborative approach between researcher, academy director, and coaches provided learning opportunities, and practical, evidence-based recommendations for improving coaching practices. Nonetheless, further research across additional female soccer contexts is required before generalisations can be made. In summary, Chapter Five offered valuable insights into practice structures and coaching behaviours in female soccer, emphasizing the prevalence of games-based activities influenced by the academy director and coach education, while also identifying opportunities to improve session efficiency and behaviours through practical recommendations.

6.4 General discussion of findings

In recent years, the talent identification and development pathways in English female youth soccer have undergone significant evolution. These changes have coincided with a period that has observed exponential increases in participation and popularity, the professionalisation of the highest two senior league tiers (WSL and WC), and structural and strategic transformations at youth level. Despite these advancements, challenges remain in optimising recruitment and development systems. This thesis sought to examine and understand the current landscape of English female soccer considering these recent developments to produce a collection of studies that offer a comprehensive foundation for future research and practical improvements. As such, based on the findings from the current programme of research, an overview of the talent identification and development pathway in England, including key milestones, practices and coaching strategies, is presented in **Figure 6.2**.

6.4.1 Participation – Initial engagement in soccer

In soccer, the participation stage refers to initial engagement at a recreational level, prior to identification and registration into an academy environment (Williams et al., 2020). Most girls typically began playing soccer through informal, peer-led play activities in early childhood (age 5-6 years), followed by coach-led practice (age 6-7 years) and competitive matches (age 7-8 years; Chapter Four). During this early phase, participation in formal soccer activities was either recreational, or supported by established youth structures, such as Regional Talent Clubs or Advanced Coaching Centres (now Emerging Talent Centres). Findings from Chapter Three indicated that most clubs (81%) within the top three tiers of English female soccer offered pre-academy coach-led practice sessions for players aged 7-11 years. This involved the provision of practice sessions and development opportunities before official

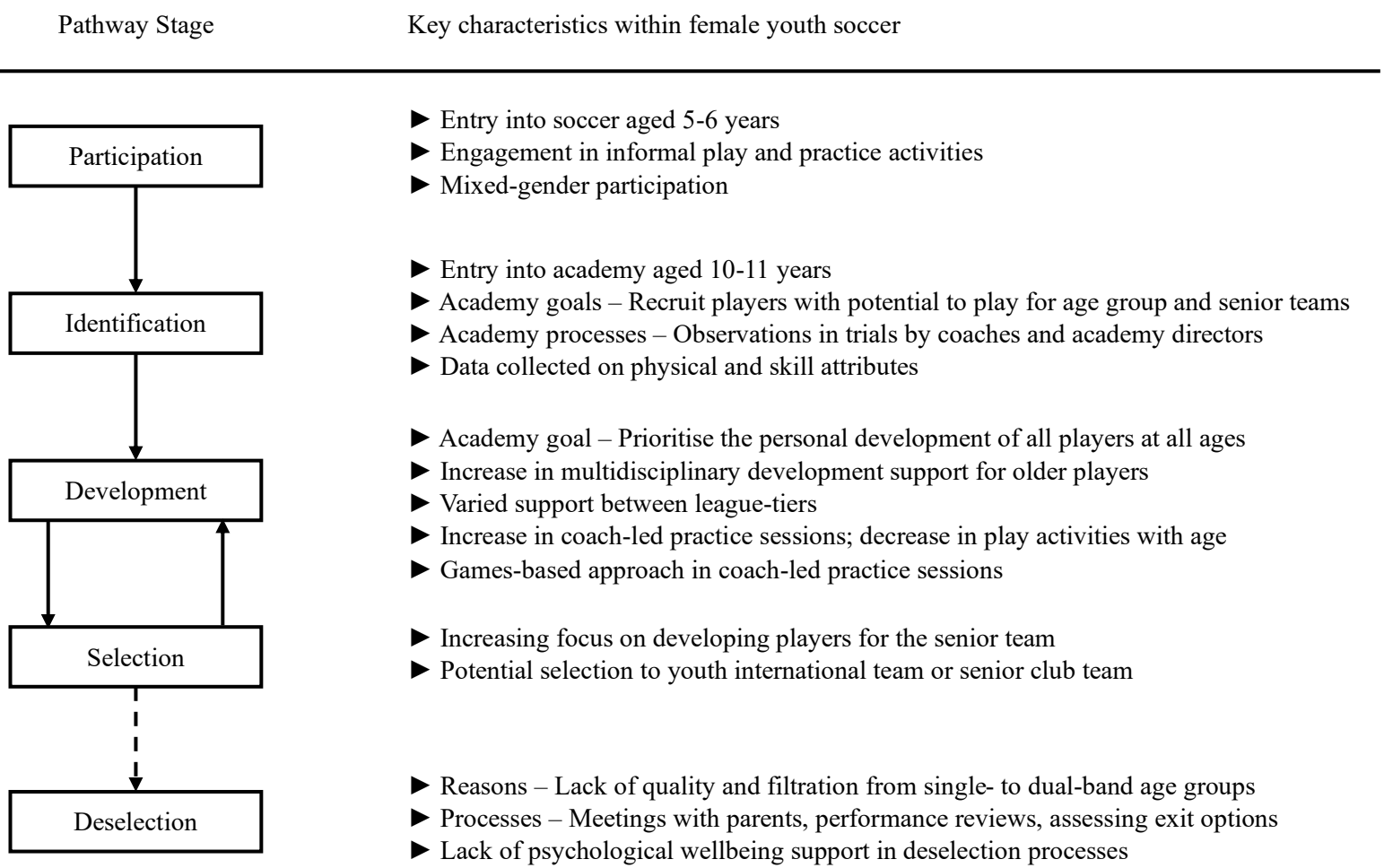

Figure 6.2 Overview of key characteristics and processes on the female youth soccer talent pathway within England.

registration with the academy, a practice that is also frequent within male youth soccer (Reeves et al., 2018a). Mixed-gender participation was common throughout early childhood and continued for approximately 4-5 years until age 12 years (Chapter Four). Moreover, 59% of players engaged in sports outside of soccer (excluding those in physical education) in addition to soccer participation, indicating a diversified sporting experience which is thought to contribute towards broader athletic development before eventual specialisation in soccer (Côté et al., 2009). However, engagement in external sports was lower in comparison to soccer, suggesting that players prioritised soccer from early in childhood.

6.4.2 Identification – Entry into academy system

Talent identification in soccer has been defined as the process of recognising players with the potential to progress into and through a high-performance development environment (Williams et al., 2020; Williams & Reilly, 2000). This investigation highlighted that female players typically entered an academy system aged approximately 10 years (Chapter Four), which is a notably earlier entry point than other samples of female players, including professional, collegiate, and ex-academy players who often entered between ages 12-16 years (Andrew et al., 2024a; Ford et al., 2020a; Hendry et al., 2019a). This earlier academy entry mirrors trends observed in male youth players within England (Ford et al., 2012) and occurs at least 2 years earlier than the entry age of current female professionals playing in England (Andrew et al., 2024a). The shift towards earlier academy entry likely reflects the expansion of youth structures and a growing emphasis on earlier talent identification within them. Additionally, the reduction in mixed-gender participation shortly after academy entry suggests that increased female-only opportunities may be facilitating early

identification and development of young players. Alternatively, this trend could also be attributed to age restrictions that were imposed on mixed-gender soccer by The FA during the development of the players investigated. For example, the current age limit lies at the U-18 level, however restrictions have been as low as the U-12 level within the last decade (Hills et al., 2020). These findings underscore how structural changes in the game are shaping the identification of young female players.

When identifying talented players for younger age categories, clubs emphasised the importance of recruiting players with the potential to progress to senior teams and to meet the needs of age-specific squads (Chapter Three). Given the absence of formal recruitment departments in many academies (81%), talent identification was primarily carried out by coaches and academy directors. While formal identification processes are still evolving, they currently remain heavily dependent on subjective observations of players during trials, in both practice and competition settings. As a result, selection decisions often hinge on the individual assessments and evaluations of coaches, with academy directors often making the final recruitment decision. This approach places significant weight on technical skills, tactical understanding, and physical characteristics as observable attributes that can influence such decisions (Christensen, 2009). In some clubs, predominantly from higher-tiers (19%), academy recruitment staff, such as scouts or heads of recruitment, were involved in selection decisions, but the limited use of psychological and sociological assessments indicates that talent identification remains a narrow, but evolving practice in female youth soccer.

6.4.3 Development – Environment and processes

Talent development refers to the provision of an environment and development programme designed to progress players towards higher levels of performance (Williams et al., 2020; Williams & Reilly, 2000). Within English female youth soccer, academy directors emphasised the long-term personal development of players as a primary talent development objective, rather than immediate performance outcomes, across all league tiers and all age categories (Chapter Three). There was also an increasing focus on developing and preparing players for the senior team as players progressed through to higher age categories. This was also accompanied by more professional and multidisciplinary support (e.g., strength and conditioning, performance analysis, and psychological support), which became more integrated into player development. However, this support varied between league tiers, with higher-tier clubs offering more comprehensive resources due to fewer financial and logistical constraints. Players in these higher-tier clubs received increased provision of strength and conditioning, and were more likely to have access to nutritional, psychological, and educational support to aid their long-term development as athletes and individuals.

The development environment within academies also facilitated increased participation in formal soccer activities, with more coach-led practice and competition opportunities as players advanced through the academy system (Chapter Three). Reinforcing this, findings from Chapter Four demonstrated a significant increase in the hours that players accumulated in these structured soccer activities from childhood to adolescence, while time spent in informal, peer-led soccer play decreased significantly, coinciding with academy entry. This transition reflects the shift from informal, enjoyment-based play activities to more formalised, but equally enjoyable practice and competition as players progressed along the talent pathway.

Within practice sessions, coaches predominantly adopted a games-based approach, designing activities that attempted to simulate competition-like conditions within practice. Practice activity analysis revealed that the average session was comprised of 54% games-based activities, 24% drill-based activities, and 22% in transition between activities (Chapter Five). All academy coaches consistently prescribed a higher proportion of games-based activities in sessions across all age categories and recognised the benefits of this approach on a variety of perceptual and cognitive skills, such as tactical understanding and decision-making. This session structure appeared to be informed by the specific coaching programme at the club, developed by the academy director, and through coach education courses. However, periods of transition between activities were viewed as excessive, and contributed towards a reduction in time that players spent active during the session (63%). Coaches highlighted that this fell short of the 70% of active session time recommended by The FA during coach education programmes.

Players rated coach-led practice sessions as highly enjoyable, and moderately to highly motivating, similar to peer-led play activities (Chapter Four). It could be postulated that the games-based approach within practice sessions could potentially mimic the inherent enjoyment and motivation gained from engaging in informal play activities, due to the nature of the play-like activities within them (Hendry & Hodges, 2019). Furthermore, as players progressed from childhood to adolescence, the physical and cognitive challenge of these sessions increased significantly to moderate to high levels (Chapter Four). This is noteworthy, since the accumulation of hours in moderately to highly challenging practice activities has been identified as a key differentiator between national and collegiate female soccer players (Hendry et al., 2019a), and could therefore be an important contributor to expertise development.

A dual-coaching model was implemented in practice sessions, ensuring two coaches were jointly responsible for coaching players. However, the extent of this collaboration varied between coaching pairs (Chapter Five). In more effective pairings, coaches worked together to ensure players were appropriately challenged. For example, one coach might deliver 1-on-1 activities to individual players, while the other managed the rest of the group. In contrast, inefficient dual-coaching was observed in cases where excessive informal conversations between coaches contributed to increased transition times.

Analysis of coach behaviours during practice sessions highlighted variations in coaching styles (Chapter Five). Some coaches adopted a more prescriptive approach, characterised by frequent instruction and praise, which has been a longstanding and traditional approach to coaching (Cushion & Jones, 2001; Ford et al., 2010a), but can lead to information overload when used in high quantities that may negatively impact upon skill acquisition and retention (Hendry et al., 2015; Williams & Hodges, 2023). Other coaches employed a guided-discovery approach, which involved using silence strategically to promote self-regulated learning and autonomy. Skill acquisition literature advocates for guided-discovery, as it encourages players to engage in problem solving and independent thinking, rather than relying on persistent and excessive instruction from coaches, which can interfere with automatic information processing and hinder learning (Ford et al., 2010a; Hodges & Franks, 2004; Larkin et al., 2022; O'Connor et al., 2018). Those that displayed frequent verbalisations of instruction expressed concerns that reducing this input in future sessions could diminish session intensity. Additionally, in line with best-practice recommendations from literature, coaches also asked more divergent than convergent questions, which are more likely to foster active learning and critical thinking

(Chambers & Vickers, 2006; O'Connor et al., 2021). Overall, these findings underscore the need for a balanced approach to coaching that promotes both skill acquisition and player autonomy while maintaining session intensity and engagement.

6.4.4 Selection – Player progression and assessment

Selection refers to the ongoing process of choosing players within a development programme that demonstrate the attributes required for progression to a future squad, such as the next age category, or the senior team (Williams et al., 2020; Williams & Reilly, 2000). As female players approach the critical ages of 16-18 years, academies increasingly focused on facilitating their progression to senior teams (Chapter Three), reinforcing the importance of a structured selection process that evaluates ongoing development. Academies at higher-tier clubs often implement more formalised and professional systems to support this transition, with ongoing assessments of technical ability and physical conditioning, which continue to be monitored and evaluated to ensure that players are developing in line with academy expectations. Players who exhibit exceptional development at this stage may eventually be selected or even promoted to senior teams within the club, as was the case for two players who were navigating the youth-to-senior transition (Chapter Four). This was also reflected in Chapter Three, as some clubs reported the loss of players from the academy as they had transitioned into senior teams at their club. Alternatively, talented players may also be identified by academies affiliated with clubs in higher league tiers, who have more robust identification processes, and can provide exposure to higher frequencies and levels of competition and practice to enhance their development (Chapter Three). Despite these pathways, homegrown player counts were low (approximately 1-2 per season), particularly within academies at lower-tiers. This suggests that clubs

encounter significant challenges in both the identification and development of emerging talent.

6.4.5 Deselection – Exit from academy system

Generally, clubs appeared to be expanding their youth structures, as reflected by a higher intake of players than losses within clubs across all league tiers (Chapter Three). For example, academies at WSL clubs recruited a median of 19 players, while losing 14, during the last full season before data was collected. Player departures were evenly split between player-initiated departures (i.e., player decided to leave the club) and club-initiated releases (i.e., club released the player), the latter primarily occurring when players failed to display the skills or attributes required for progression through the pathway (Williams et al., 2020) and were subsequently deselected. This highlights potential issues with the quality of the talent pool within the female game, and suggests that current, largely subjective and unrefined talent identification processes may lead to less informed selection decisions, with some players ultimately falling short of academy standards. While most clubs offered exit pathways for deselected players, the level of support provided to them varied significantly between academies. Common exit processes included meetings with parents to discuss the rationale for deselection, performance reviews, and discussions of potential exit options, which are typical in youth sport (Neely et al., 2016). However, there was a notable lack of psychological and wellbeing support following deselection, which can leave players vulnerable to significant negative consequences such as anxiety, depression and identity disruption (Blakelock et al., 2016; 2019; Brown & Potrac, 2009; Neely et al., 2017; Wilkinson, 2021). This underscores a critical gap in both provision and psychological support for players navigating deselection.

6.4.6 Challenges and gaps in the process

Despite progress, academy systems in the female game continue to face challenges in expanding and optimising both talent identification processes and development pathways, particularly in lower-tiers and younger age groups. The increased focus on developing players for senior teams at older age categories appears to have led to a concentration of, sometimes limited, resources to these age groups, potentially at the expense of younger players (Chapter Three). While clubs emphasised the personal development of players at all levels, the shift toward competition and performance at older ages may create tension within the development process. Increased investment may help expand talent identification and development processes across all levels. Additionally, increased financial rewards tied to senior team success, such as winning competitions, could also provide clubs with an incentive to invest further in their female academies.

A significant challenge identified was the scarcity of dedicated recruitment departments and specialised staff within academies that are responsible for talent identification (Chapter Three). As a result, processes remain subjective and often limited to individual coaches and academy directors. Current assessments, particularly for younger players, tend to focus heavily on soccer skills and physical attributes. Therefore, other critical psychological factors including resilience, self-regulation and concentration (Forsman et al., 2016; Van Yperen, 2009), as well as social factors such as family support and hours in practice (Gledhill et al., 2017; Andrew et al., 2024a) may be overlooked, yet are also important for long-term participation and success in the sport. By incorporating these psychological traits and acknowledging social influences in player assessments, academies could adopt a more holistic approach,

ensuring that players not only develop the necessary soccer abilities but also the cognitive and social skills and support networks required to prosper in a competitive environment. However, financial and resource limitations remain significant barriers to the integration of recruitment teams into academy structures.

Player retention also emerged as a challenge to academies. Although youth structures are generally expanding (Chapter Three), clubs faced difficulties retaining players for both internally and externally controlled factors. Player-initiated departures often resulted from players transferring to higher-tier clubs that offer enhanced development opportunities. This is a prevalent issue within soccer (Ford et al., 2020b; Reeves et al., 2018a), but is particularly pronounced in female youth soccer, where disparities between academy systems are more evident (Chapter Three). Additionally, players departed due to the struggle to balance soccer with other commitments, such as participation in additional sports, employment, or education. This finding aligns with previous research that highlighted the demands that players face in managing dual-careers (i.e., balancing soccer participation with education or employment). Many players reported receiving inadequate support from both educational institutions and soccer academies, which can exacerbate the difficulty of maintaining this balance (Harrison et al., 2020). Moreover, access to elite-level practice environments poses a particularly unique challenge for female youth soccer within England. Some players and parents faced substantial travel demands to participate in practice and competition, which may hinder their commitment and overall experience (Department for Culture, Media and Sport, 2023). However, recent structural changes, such as the introduction of a greater number of ETCs, aim to mitigate these challenges by providing more localised access to high-quality practice environments. Such initiatives represent a

crucial step toward improving player retention and fostering the development of female talent in soccer.

Academies also contended with player losses during certain transitions between age groups. In a large proportion of clubs, players must progress from a single-band age group (e.g., U-14s) to a dual-band age group (e.g., U-16s), due to the absence of intermediate age categories (e.g., U-15s). This structural limitation often leads to the release of players, undermining efforts to expand the talent pool and increase overall participation rates. This transition may be particularly challenging for players who may not be ready to compete at the higher level required in the dual-band age category, resulting in unnecessary attrition or deselection. To address these issues, there is hope that the continued expansion of youth structures, coupled with increased investment in the female game, will enable academies to implement single-band age categories, thus reducing player losses and better supporting the growth of the game.

6.5 Implications

Given the complexities of talent identification and development, as well as the involvement of multiple stakeholders in these processes, the following section has been divided into distinct theoretical and applied implications for female youth soccer in England. First, the theoretical implications of talent identification and talent development are outlined, followed by applied implications and practical recommendations for key stakeholders. In assessing talent identification and development processes, player engagement patterns, and the microstructure of practice design and coaching behaviours, this research draws on several key theoretical concepts and frameworks, including developmental pathways towards

expertise, talent identification, and deliberate practice. It was deemed important to revisit and situate these concepts within the context of female youth soccer to make a significant contribution to this relatively unexplored field, where understanding and knowledge remain in their early stages. Another key focus of this thesis was to offer a gender-specific perspective, which is essential given the distinct developmental demands faced by female players and the systemic differences between male and female soccer academies. Additionally, there are several important practical implications for those involved in the identification and development of players on the female youth talent pathway within England. Some findings are particularly relevant to specific stakeholders; therefore, these implications are categorised accordingly rather than presented as a collective. Each group will be discussed separately to provide a clearer understanding of how these findings impact their respective roles and responsibilities.

6.5.1 Talent identification – Theoretical implications

Study One (Chapter Three) identified critical gaps in talent identification processes within female soccer academies, particularly the scarcity of specialised recruitment departments and staff, and a reliance on subjective player assessments. In particular, these processes are much less refined in comparison to male youth soccer strategies and systems. For example, in examining factors influencing talent identification in male soccer, Reeves et al. (2018a) conducted interviews with multiple dedicated recruitment staff operating within a male academy within England, yet in female soccer, there is evidently a scarcity of recruitment staff to explore such issues, with identification merely limited to coaches. This highlights the significant disparity

between male and female academy systems and reinforces the need to look at such issues through a gender-specific lens.

One key concern regarding the processes that are used within female academies for player recruitment is the efficacy of isolated, subjective assessments of players by coaches during observations in trials. During these trials, the 'coach's eye' or 'gut feeling' often plays a role in player selection (e.g., Christensen, 2009), despite evidence that this can lead to biases based on physical attributes, such as early physical maturation, potentially leading to relative age effects (RAEs). This subjectivity may result in certain types of players being overlooked or disproportionately selected, depending on the preferences or biases of those making decisions. For example, early-maturing players might be chosen for their immediate physical advantages, while late bloomers or those with more subtle technical and tactical skills may be missed. Since girls tend to mature earlier than boys (Malina et al., 2004), these biases may occur at even earlier ages, further compounding the issue.

The use of these subjective assessments in isolation to inform recruitment decisions, coupled with early identification of talented players, may not be an effective strategy for fostering future expert performers (Côté & Erickson, 2015; Meylan et al., 2010). While there are moves toward more objective measures of talent, such as physiological tests, tactical assessments, or psychological evaluations (Unnithan et al., 2012), the process within female youth soccer remains heavily influenced by subjective factors, particularly at younger ages when potential is difficult to measure. Some academies have introduced some standardised measures; however, the practical implementation of such measures remains in its infancy, particularly in lower-tier clubs (Chapter Three). Therefore, a greater degree of objectivity is required and recommended for female youth soccer moving forward. Subjective evaluations should

be used in conjunction with a range of objective measures of player attributes to provide a holistic rationale for identification (Williams et al., 2020). Although, it is acknowledged that female academies face challenges, particularly financial, that may significantly limit the immediate integration of more objective approaches.

In developing a more objective approach, consideration of attributes and characteristics other than physical, technical, or tactical, is required. Even the most technically talented players can fail to endure due to a lack of resilience and mental toughness, or a strong support network (Reeves et al., 2018a). For example, certain psycho-social attributes have been linked to sustained participation and progression within female youth soccer in England, including the influence of social support, such as parents and friends, a positive coach-player relationship, and self-regulation (Gledhill et al., 2014). Yet, these attributes are currently overlooked in talent identification processes within female academies, while other sociological influences such as socio-economic status and background have scarcely been considered.

To improve talent identification, those responsible for recruitment should move beyond immediate performance indicators, often consisting of observable characteristics, such as physical (e.g., height or speed) and technical skills (e.g., dribbling or passing), and consider a broader range of attributes that might contribute to future potential. However, despite the potential efficacy of this holistic approach, it is much more challenging for clubs to collect data on attributes other than physical and skill (Reeves et al., 2018c), especially given there is a lack of specialised staff (e.g. psychologists) operating within the female game. Researchers must therefore consider how to optimise current talent identification strategies within the constraints and challenges that female soccer academies face, ensuring that current approaches, although subjective, are as robust as possible, at least until more objective approaches

become integrated into existing strategies. One potential solution is the development of gender-specific frameworks that account for the unique needs of female players and their developmental trajectories. These frameworks could support academies and staff responsible for player recruitment in implementing more objective measures where feasible, while strengthening subjective assessments with clearer, more structured criteria. Suggestions and recommendations for the implementation of such frameworks are later discussed within the applied implications section of this chapter (*6.5.3)*.

6.5.2 Talent development – Theoretical implications

6.5.2.1 Developmental pathways towards expertise

In exploring the developmental pathways within female youth soccer, this programme of research contributes to the long-lasting and ongoing debate between early specialisation and a diversified sporting engagement in the development of athletes towards expert performance. Elements of both pathways towards elite performance outlined in the DMSP were evident in Study Two (Chapter Four), with 44% of players specialising exclusively in soccer, while 56% engaged in additional sports, such as swimming and athletics, alongside soccer. However, consistent with existing literature on professional female soccer players (Ford & Williams, 2023), findings were most commensurate with the early majority engagement pathway towards expertise (Ford et al., 2009; Hendry & Hodges, 2018; 2019). Specifically, engagement in soccer was characterised by high levels of soccer-specific play and practice within childhood, but not to the exclusion of participation in other sports. For example, players accumulated ~910 hours in coach-led practice activities, and ~870 hours in peer-led play activities

during childhood, which contributed to 69% of childhood soccer engagement. This pathway therefore supports a hybrid model, whereby elements of both specialisation and diversification can coexist (Hendry & Hodges, 2019).

Although players in this study were yet to reach senior performance levels, the findings provide insight of current youth engagement patterns and how they compare to other groups, such as professional players. Such comparisons can highlight progress in the development of the female game within the nation or indicate the trajectories of current players towards the elite level. Therefore, this data does not infer that either pathway to elite performance outlined in the DMSP, specialisation or diversification, is superior in leading to expertise. Instead, it provides a foundation for future research aimed at refining best practices specific to female soccer development. It is recommended that researchers continue to investigate the long-term outcomes of different pathways to expertise within the female game, and how these trajectories may change during development. This would allow for more targeted, evidence-based recommendations and frameworks that align with the unique developmental needs of female soccer players.

6.5.2.2 Microstructure of practice activities

Notably, this programme of research reinforced the importance of examining practice quality rather than focusing solely on quantity, by exploring the microstructure of practice design within academy practice sessions (i.e., what coaches provide to players). Specifically, Study Three (Chapter Five) revealed that a significant portion of coach-led practice activities were games-based, which are play-like in nature and simulate competition more effectively than through drill-based activities. Should these findings reflect a broader trend across other academies, they may help explain why

coach-led sessions had a positive impact on player enjoyment and motivation ratings, and in a similar way to peer-led play activities (Chapter Four). For example, players reported consistently high levels of enjoyment and moderate-to-high motivation across both peer-led play and coach-led practice activities from childhood to adolescence. This games-based approach is supported by skill acquisition literature, which emphasises its role in developing essential perceptual-cognitive skills, such as active decision-making and anticipation, that are crucial for soccer performance and long-term career attainment (Ford & Williams, 2013; Hendry & Hodges, 2019; Roca & Ford, 2020; Roca et al., 2012). Additionally, early engagement in play activities during childhood is thought to foster the initial enjoyment and motivation for sustained involvement and eventual success in sport (Côté et al., 2009). These findings suggest that, even in structured, coach-led environments, incorporating games-based activities can deliver the same developmental benefits typically associated with unstructured peer-led play.

Moreover, this research, the first to assess practice design in-depth within female soccer, contributes to the literature not only through context, but through highlighting a potential widespread use of games-based practice activities within coach-led sessions (Chapter Five). Although the case study design of this investigation may limit the generalisability of findings to other female soccer academies, qualitative data indicated that coach education played an influencing role in shaping practice design. The integration of skill acquisition principles into real-world coaching environments and practices suggests that contemporary coach education programmes are, among other factors, positively influencing the adoption of games-based approaches, and that this practice design could also extend to other academies.

6.5.2.3 Deliberate practice

The research also raises important questions about the applicability of the deliberate practice framework in team sports like soccer, challenging whether players truly engage in this form of practice during coach-led or individual sessions. According to the original definition outlined by Ericsson et al. (1993), deliberate practice is effortful, aimed at improving weaknesses in performance, and offers little inherent enjoyment. In Study Two (Chapter Four), both coach-led practice and individual practice were conducted with the purpose of improving performance, as reflected in the definitions provided within the PHQ. However, players did not perceive these activity types to be as physically or cognitively effortful as the definition of deliberate practice suggests. Similarly, both activity types were rated as high to very high in enjoyment.

This divergence highlights that the practice activities experienced by players do not appear to resonate entirely with the characteristics of deliberate practice. The deliberate practice framework was originally based on the hours of focused and structured practice accumulated by individual musicians, emphasising the need to rethink how deliberate practice may apply to team sports such as soccer, where individualised feedback and highly structured practice are more difficult to implement within group coach-led practice sessions. It is more likely that players were engaging in alternative types of practice, such as structured (coach-led practice) and purposeful (individual practice) practice activities, which share characteristics of deliberate practice but do not fully align with its criteria (Ericsson & Harwell, 2019; Ericsson & Pool, 2016; Hütterman et al., 2014). For example, structured practice refers to activities in a group context led by a coach, whereby activities are not individualised and immediate feedback is not always provided to learners, and therefore more realistically represents coach-led practice. Similarly, purposeful practice more likely

reflects individual practice, consisting of solitary practice with the goal of improving performance, but without supervision and feedback from a coach. This reinforces the need for re-conceptualising deliberate practice in team sports such as soccer to account for the dynamics of team environments, enjoyment, and engagement. Some researchers have made initial efforts to operationalise deliberate practice for team sports (Eccles et al., 2022; Ford & Coughlan, 2019; Williams & Hodges, 2023), although validation of such practical frameworks is required to determine their success and applicability in practice.

6.5.2.4 Gender-specific insight

This research underscores the importance of integrating gender-specific factors into talent development frameworks, highlighting that female soccer players experience unique developmental milestones, trajectories, and academy environments in comparison to their male counterparts. Moreover, this thesis offers a foundation for developing frameworks tailored to the needs and development environments of female players by integrating gender-specific insights into theoretical models and notions of talent identification and development. As a result, this thesis advances a more inclusive understanding of athlete development. Additionally, it addresses the paucity of research conducted on female samples (Curran et al., 2019), making a valuable and timely contribution to understanding the evolving landscape of female youth soccer. The novel insights into key structural and developmental processes, that have historically been under-researched in female soccer, establish a solid base of data to inform the development of meaningful and effective frameworks that are specifically tailored to talent identification and development in female soccer.

6.5.3 Applied implications

6.5.3.1 Academies

This research reveals several key areas where academies can improve their talent identification and development strategies, particularly to meet the needs and challenges of female youth soccer. Currently, recruitment processes, particularly at lower-tier clubs, are often subjective and lack standardisation. To address this, academies should aim to implement more objective and structured recruitment systems by introducing dedicated recruitment teams to alleviate the burden on coaches and academy directors and establish more specialised processes. These teams should consider the influence of psychological and social factors that may influence future potential, alongside existing measures of physical and skill attributes, to minimise biases in player identification and selection, and inform holistic decisions. This is especially important at younger ages, where player recruitment tends to be less structured, and where potential can be overlooked due to factors like early physical maturation.

Additionally, adopting a multidisciplinary and collaborative approach that integrates strength and conditioning, physical assessments, performance analysis, along with psychological, nutritional, and educational support, should be a goal for all academies, at all stages of development. This would provide players with comprehensive and holistic developmental support and ensure that academies continue to positively impact the personal development of players, alongside their progress in soccer. However, it is acknowledged that in order to achieve this goal, multiple challenges faced by academies must be overcome. Financial constraints, particularly for clubs in lower league tiers, currently pose a significant barrier to the

implementation of this recommendation. Support from governing bodies, sponsors, and senior teams will be essential for building more sustainable and equitable academy programmes. A potential short term solution may involve collaboration with local universities, whereby academies could gain access to knowledgeable support staff without having to bear the full financial burden themselves. For example, universities could provide student researchers or practitioners via internships to offer strength and conditioning support, performance analysis, or psychological services. This would not only help academies implement a more multidisciplinary approach until long-term solutions are established, but also create opportunities for students to gain practical experience.

The integration and consideration of psychological and sociological factors into talent development programs appears to be scarce within academies. Recognition of these influences on player development presents challenges in both measurement and implementation (Reeves et al., 2018c). Psychological traits such as resilience, motivation, or confidence may fluctuate over time and can be shaped by many external factors (e.g., family support, personal experiences; Gledhill & Harwood, 2014; 2015), which complicates efforts to capture and accurately assess their true impact on player development. For example, perceptions of enjoyment and motivation remained steadily high across player development (Chapter Four), which could be attributed to a variety of social factors, such as a positive learning environment, or being part of a team that frequently wins during competition; conversely, losing matches more frequently may have a negative impact on enjoyment and motivation across development. Furthermore, existing tools and methodologies used to assess psychological characteristics, well-being, or personal development may not always be robust or accessible to academies. For example, self-report questionnaires or

interviews may be prone to bias, whereby players provide responses they believe will influence selection opportunities (Raglin, 2001). A potential solution to this issue may arise from the development of longitudinal and context-specific assessments that provide a more nuanced understanding over time, which could be integrated into current player development processes.

Moreover, social influences such as socio-economic status and geographic location, can also play a significant role in determining players' access to high-quality soccer development opportunities. Players from lower socio-economic backgrounds may encounter barriers such as travel demands, expensive training equipment, or limited access to elite academies, which could hinder development compared to more advantaged peers. To create a more equitable and effective talent development programme, academies must recognise these factors, invest in psychological support systems, and be proactive in addressing socio-economic disparities. For example, providing scholarships or reduced participation fees can ease financial burdens for talented players from disadvantaged backgrounds. In addition, implementing solutions such as transportation services and residency programmes, which are already common in male academies (Ford et al., 2020b; Mills et al., 2014), but less so in female academies (Chapter Three), would also greatly benefit players. Since these initiatives may currently pose financial challenges, they are presented as long-term goals that could significantly enhance the development experiences of female players. By focusing on these areas, academies can foster a more inclusive environment that supports the holistic development of all players.

To develop these environments, academies should recognise the strengths of all pathways to expert performance and implement flexible talent development models that accommodate diverse player experiences. This would ensure that the unique

characteristics of each pathway are considered. For example, early specialisers may require targeted support to manage the risk of burnout, overuse injuries, or plateauing in skill development (Côté et al., 2012). Conversely, diversifiers might benefit from more focused soccer-specific training and guidance to accelerate their technical and tactical development once they narrow their focus to soccer. Coaches and support staff should be educated on the nuances of early specialisation, diversification, and engagement pathways, and trained to recognise and nurture the potential of players from varied backgrounds. This would require wider support from governing bodies and researchers to integrate knowledge about the specific needs and risks associated with each pathway into coach education programmes, helping coaches better identify the appropriate developmental support for each player.

As the female game continues to grow within England, the size of the talent pool will inevitably expand, as will the number of players that face deselection. Therefore, it is critical that academies continue to maintain a focus on the personal development of their players across all age groups, as the female game continues to evolve. Support systems for those leaving academies, particularly after deselection, should be strengthened. Structured programs offering emotional and career support can mitigate the negative impacts of deselection and promote healthier transitions out of academy systems. The widespread integration of sport psychologists is recommended to support this, however, the financial constraints faced by many academies may limit the implementation of this, among many other recommendations for best practice. It is clear that additional support is required to help academies address these constraints and provide holistic support to players.

6.5.3.2 Coaches

For the coaches operating within academies, several applied implications surface regarding practice design and coaching behaviours. Players consistently reported high levels of enjoyment, alongside moderate to high levels of motivation, physical challenge, and cognitive challenge during coach-led practice sessions. This appears to be linked to a preference for games-based over drill-based activities, as recommended by skill acquisition literature. Thus, continuation of this approach is strongly encouraged.

However, this research also identified inefficiencies in session flow due to excessive transition periods between activities. To mitigate this, a number of practical strategies from coaches that effectively managed transition times were highlighted, and recommended, for those with less resourceful management. Coaches can enhance the flow of practice by preparing sessions efficiently in advance, or through collaborative dual-coaching methods. Additionally, empowering players, particularly those in older age categories, to lead short activities while coaches set up the next group activity not only decreases time spent inactive but can also foster leadership and other desirable social traits. Moreover, while informal discussions with players can be valuable for rapport building, maintaining a focus on session-related communication is advised to avoid unnecessary delays. Some transition time is essential to allow for rest, recovery, and hydration for the next activity, and for coaches to provide debriefs and instructions for preceding and succeeding activities. Thus, allocating 15% of total practice time for these transitions is suggested as a reasonable target to maximise efficiency.

Coaches also displayed a variation in coaching behaviours and styles during practice sessions, with some displaying uncertainty about the optimal balance between instruction and silence. This underscores the need for further coach education and

training in diverse coaching methods and approaches. A guided-discovery approach, where players are encouraged to solve problems independently, is recommended to foster autonomy and deeper learning (Larkin et al., 2022). Coaches should also continue to prioritise divergent over convergent questioning to promote critical thinking and reduce the frequency of praise in favour of high-quality, specific feedback (O'Connor et al., 2021; Stonebridge & Cushion, 2018). This feedback should be delayed, have an external focus of attention, and be provided sparingly (i.e., a 'less is more' approach), to maximise its effectiveness (Anderson et al., 2019; Otte et al., 2020). Training programs that help coaches tailor their feedback and instructional styles according to the needs of the session can improve coaching effectiveness. Individualised feedback sessions for coaches based on behavioural observations and analyses of their practice, as conducted in Study Three (Chapter Five), provided tailored recommendations for coaches to utilise in future sessions, therefore it is hoped that this research can have a lasting impact on coach behaviours within this academy. The collaborative methodology used in this chapter not only contributes to academic knowledge but also provides direct, evidence-based guidance for coaches and academy directors, paving the way for more informed and effective coaching in female soccer.

6.5.3.3 Governing bodies and policy makers

For governing bodies and policy makers, the research also presents significant implications. To address the highlighted issues relating to talent identification processes, it is recommended that temporary Continued Professional Development (CPD) opportunities be introduced for staff involved in player identification and recruitment. This initiative would provide immediate support until academies are able

to embed specialised recruitment personnel. Such educational programmes may have already had a positive impact within the academy environment, particularly in shaping practice design within coach-led sessions (Chapter Five). Given that coach education through the governing body was cited as an influencing factor in the provision of games-based activities, and that coaches appeared to be well-informed of the benefits, ongoing provision of targeted coach education programmes will be critical to optimising the talent pathway in female soccer.

Despite the potential for coach education to improve many aspects of the talent pathway, significant structural challenges remain, particularly the financial constraints faced by academies and the disparities between those from higher-tier and lower-tier clubs. While this research offers several practical recommendations for improving talent identification processes, recruitment strategies, and player development pathways, many of these require substantial financial investment in infrastructure, staff, and resources. Therefore clubs may struggle to implement these recommendations without additional funding and support from governing bodies or external sponsors. This resource disparity risks widening the talent gap, as lower-tier clubs may find it increasingly difficult to compete for talent or provide comparable developmental support. This, in turn, threatens to reduce the diversity and size of the overall talent pool in female soccer, potentially leading to a less equitable talent development system. Addressing these challenges should be a top priority for those responsible for overseeing and developing the female talent pathway. Without strategic investment and resource allocation, the ability of the system to foster and sustain talent at all levels will remain limited.

To further promote the growth of female soccer in England and incentivise player development, there have been calls for the governing body to establish and

invest in a female-specific framework and talent pathway (Department for Culture, Media & Sport, 2023). In male soccer, the EPPP serves as a valuable model for youth development that provides structured guidelines for player identification and development, while ensuring accountability for the quality of facilities, coaching, education and welfare provisions (The Premier League, 2011). Importantly, the EPPP ensures that male soccer academies are compensated for investing in the development of players who eventually transfer to other clubs, creating a financially sustainable system. Until recently, no equivalent compensation system existed within the female game in England (Ovaisi, 2023). However, the recent introduction of academy compensation fees by The FA for clubs in the top two tiers of the female soccer pyramid represents a significant step forward. This system enables clubs to reinvest in youth development, contributing to the long-term sustainability and growth of their programmes. It is therefore recommended that a comprehensive and gender-specific model or framework, similar to the EPPP, can be introduced for female soccer. This framework should be tailored to the distinct needs of female players and academies, guiding talent identification and development efforts, and fostering a more structured and financially sustainable pathway for the next generation of female players. Such a model would not only support player progression, but also promote the long-term growth and further professionalisation of the sport.

The creation and development of these gender-specific frameworks would require a collaborative approach, spearheaded by researchers, sport scientists, and policy-makers within national governing bodies of soccer (e.g., The FA), alongside academy directors and recruitment specialists. A multidisciplinary effort would be essential, incorporating input from a range of key practitioners and experts with extensive experience in the female game to ensure that the framework is evidence-

informed and relevant. Governing bodies and organisations supporting the development of the female game (e.g., The Premier League) could allocate funding and resources to facilitate research and pilot studies aimed at validating this framework before broader implementation.

Application could begin with the integration of this framework into the coach education curriculum, ensuring that staff responsible for player recruitment and development are trained to assess players holistically, using both objective data and refined subjective criteria. Additionally, The FA could establish partnerships with higher education institutions to support research and training initiatives. These partnerships could involve workshops, seminars, or online training modules to disseminate knowledge and best practices to academy staff at various levels and developmental stages. Academies could assist in piloting these frameworks, in collaboration with researchers, to assess their effectiveness and make adjustments before wider implementation. In the long term, this framework could serve as a blueprint for talent identification and development in female soccer, fostering consistency of best practice across clubs and academies while ensuring that processes are aligned with the unique developmental needs of female players. This approach would also promote a more equitable system, allowing clubs to recognise and more effectively nurture a broader range of players who possess the potential to succeed at higher levels of competition. Ultimately, this would not only enhance player development but also contribute to the overall professionalisation and sustainability of female soccer in England.

6.6 Limitations and future research directions

This thesis offers a comprehensive examination of the structures and practices within the female youth soccer development pathway, providing critical gender-specific insights that have been largely underexplored. By integrating structural, developmental, and coaching factors across the chapters, the research identifies key areas where female soccer currently lags behind male soccer, while presenting practical, evidence-based solutions that can be implemented to bridge these gaps with gender-specific considerations. Given the continued trajectory of growth in the female game, this research holds significant potential to influence future talent identification and development strategies in female soccer, shaping both academic discourse and practical applications within the sport. The cumulative findings from this thesis can inform policy reforms, enhance academy practices, and contribute to more equitable and effective talent pathways for female players. However, this research is not without limitations. The following sections will discuss these limitations and offer recommendations for future research to build upon and extend this work.

6.6.1 Context-specific findings

This research offers valuable insights into talent identification and development processes in female soccer, though it is important to acknowledge that the findings are based solely on data from academies in England, and are therefore context-specific. While this was a primary focus of this thesis, the generalisability of findings to other nations may be limited due to structural, cultural, and organisational differences in soccer academies across the world (Kelly et al., 2023). For example, the unique dynamics of the English female soccer system, including the recent growth in professionalisation and investment, suggest that these conclusions may not fully apply to other regions. In nations where female soccer is less developed, talent identification

processes, available resources for player development, and cultural attitudes toward female participation in sport may differ substantially from those in England. However, the nation-specific focus of this research does underscore its utility in providing contextually relevant recommendations for improving the English talent pathway. It is recommended that future research examining the talent pathways within other soccer nations follows this example to understand their own pathways and constraints to provide recommendations for progression within their own nation. Equally, by examining and comparing diverse soccer systems, future research could contribute to a more nuanced understanding of best practices in female talent identification and development, ultimately fostering the growth of the sport on an international scale. Given the global increase in popularity and participation in female soccer, exploring such avenues would be a timely endeavour.

6.6.2 Limited sample size and scope

The sample sizes used within this programme of research varied across studies, influencing the generalisability of findings. For example, Study One (Chapter Three) surveyed 54% of academies within the top three tiers of English female youth soccer, offering a representative sample. However, Study Three (Chapter Five), which employed a case study approach, focused on a single club from the highest league tier in the nation, to investigate practice design and coaching behaviours. Since coaches in this study cited the club's philosophy and the influence of the academy director as significant factors in shaping their practice design, it is possible that these findings may not be reflective of practices within other academies. Consequently, some aspects of this research may not fully capture the diversity of talent development pathways across the entire soccer landscape within England. Future research could therefore aim

to expand both the scope and diversity of samples to provide a more comprehensive view of the talent development landscape. This would help to identify potential differences in coaching practice, club provisions, and development philosophies that exist across the female soccer pyramid. Additionally, investigating grassroots and elite professional environments could capture insights from the full breadth of the player development pathway, from early participation to the highest levels of competition.

Furthermore, aside from Study One (Chapter Three), lower-tier clubs were underrepresented, leaving the philosophies, practice structures, coaching behaviours and player engagement patterns at these levels unexamined. Therefore, findings are likely skewed toward elite-level practices, which may not be applicable to all clubs. Academies with fewer resources or financial constraints may face challenges that influence their approaches to talent development. Coaches and academy directors in these environments may have to balance multiple roles, and the hiring of specialised staff such as sports psychologists, nutritionists, or dedicated scouts, may be unfeasible. Additionally, geographic, socio-economic, and tier-based differences may lead to distinct approaches to player development. Despite these limitations, this investigation provided a comprehensive examination of the talent pathways within elite female youth soccer, providing several important insights to provide a foundation for future research, and for academies to develop and refine their processes and strategies, thereby contributing to the continued progression of the female game.

6.6.3 Lack of longitudinal and prospective methodologies

Retrospective and descriptive approaches, where data is collected on previous events in time or current practices, were adopted within this thesis to provide useful insights into existing pathways. However, such methods do not capture how different

development pathways and practices influence players over time. As a result of conducting descriptive research within this thesis, the efficacy of the processes and strategies employed by academies, or the effectiveness of certain developmental pathways and trajectories, such as early specialisation and diversification, on later performance and selection within female youth soccer, have not directly been measured (Barraclough et al., 2022). To address this gap, longitudinal research is needed, rather than relying on cross-sectional investigations. Longitudinal approaches would track players over several years to capture changes in a range of key variables over time, offering a deeper understanding of how developmental experiences may shape long-term outcomes (Baker et al., 2017; 2020; Barraclough et al., 2022; Randell et al., 2021). By examining players throughout their development, researchers could assess how early influences, such as recruitment practices, coaching methods, and practice structures impact career trajectories and overall success in the sport.

A multi-disciplinary approach would be essential to holistically evaluate talent identification and development and consider a range of factors that may influence both current and potential future performance (Barraclough et al., 2022). For example, researchers could track changes over time in a variety of variables including: physical attributes such as strength, height, endurance, and speed; technical and tactical skill progression including assessments of ball control, passing accuracy, decision-making, and spatial awareness; psychological factors such as motivation, self-regulation, and resilience; social influences such as support systems and coach-player relationships; sociocultural influences such as accessibility to resources, community size, and infrastructure; and biomechanics and injury risk, including risk factors, recovery, and injury prevention. Additionally, longitudinal studies could illuminate retention rates, helping to understand why some players succeed or persist in the sport while others

drop out (Baker et al., 2020). For example, these studies could reveal the long-term psychological impacts of deselection, injury, or transitioning out of academy systems. By acknowledging and addressing these limitations, future research can create a more nuanced and comprehensive understanding of the factors influencing female talent development in soccer.

6.7 Concluding remarks

In conclusion, the present thesis has provided a comprehensive investigation into the talent identification and development pathways within female youth soccer academies in England, offering critical insights into the current processes of player recruitment, development, and deselection. Drawing on data from academy directors, coaches, and players, the research outlined the complexities of youth development systems during a pivotal period of unprecedented growth for female soccer within the nation, to provide a contemporary understanding of current practice. Key findings underscore that, while players are entering the academy system at younger ages, identification processes remain largely subjective, particularly in lower-tier clubs where financial constraints may limit the establishment of more objective and systematic approaches. Within coach-led practice sessions, the frequent provision of games-based coaching reflects alignment with contemporary skill acquisition literature and recommendations, yet inefficiencies in practice design and coaching behaviours persist. This descriptive research on the development pathways that elite youth players progress through is a valuable first step in discovering and understanding the utility of current strategies, highlighting gaps in knowledge and in the processes employed within academies, and discussing factors that require change or improvements to

optimise the talent pathway (Ford et al., 2012). It is hoped that further investigations can explore the efficacy of such processes on player performance (both current and future), learning, and wellbeing.

The findings from this thesis highlight advancements to the pathway in line with current growth, but also reinforce the urgency of addressing financial and structural issues across academies to ensure more equitable access to resources. By improving recruitment systems, expanding psychological and social support, and investing in a more robust infrastructure across all tiers, the talent development pathway in female soccer can be optimised. Notably, this thesis echoes calls for a gender-specific framework to inform and guide talent identification and development practices that are specific to the female talent pathway. As the sport continues to grow, these changes are essential to cultivating a more inclusive, sustainable, and supportive environment for the next generation of female players, helping to unlock their full potential.

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8 List of Appendices

Appendix A: Survey of talent identification and development processes (Chapter Three)

Question	Question Type	Response Options
RESPONDENT CHARACTERISTICS (3 Qs)		
How many years of experience do you have working in football?	Multiple Choice	• Under 1 year • 1-2 years • 2-5 years • 5-10 years • 10+ years
How many years of experience do you have working in female football?	Multiple Choice	• Under 1 year • 1-2 years • 2-5 years • 5-10 years • 10+ years
How would you describe your working hours within the club?	Multiple Choice	• Full time • Part time • Voluntary • Other (please specify)
CLUB CHARACTERISTICS (6 Qs)		
What division does your first team currently play in?	Multiple Choice	• WSL • WC • WNL-N • WNL-S
What division does your oldest academy team currently play in?	Free Text	
Does your club host an ETC (Emerging Talent Centre)?	Simple Multiple Choice	• Yes • No
Does your club have the following departments catering for female players?	Checkboxes	• Recruitment (e.g. scouts) • Sports Science • Medical • Psychology • Nutrition • Performance Analysis • Other (please specify)
Does your club cater to players aged 7-11 (Foundation Development Phase)?	Simple Multiple Choice	• Yes • No
State (as close as possible) the number of players currently registered at your academy within each age stage [7-11/12-16/17-21].	Free Text	

TALENT IDENTIFICATION – CHARACTERISTICS AND PROCESSES (9 Qs)		
When identifying talented players for your club at each age stage [7-11/12-16/17-21], how important are the following points? a) Identifying players with the potential to play for the first team b) Identifying players who could eventually be sold on to other clubs for financial gain c) Identifying players to meet the needs of age-specific teams (e.g. U16s) d) Identifying players best suited to the clubs playing style	Matrix/Rating Scale	(1) Not at all important (2) Low importance (3) Neutral (4) Important (5) Very important
Which of the following processes does your club use when identifying talented players at each age stage [7-11/12-16/17-21]?	Checkboxes	• Observation in trials (e.g. training, matches) • Identification in open door scouting events • Performance analysis (technical and tactical characteristics and statistics) • Medical assessment (e.g. cardiac screening, sprint tests) • Psychological assessment (e.g. psychometric tests) • Physiological Assessment (e.g. body composition, maturation, height, weight) • Physical Assessment (e.g. endurance, strength, fitness) • Video feedback • Background assessment (e.g. family, area of upbringing) • Other (please specify)
Who is responsible for the identification, evaluation, and selection of players at your club?	Checkboxes	• Scouts • Coaches • Head of Recruitment • Academy Director • Club Board • Other (please specify)

Who makes the final decision to recruit a player?	Multiple Choice	• Scouts • Coaches • Head of recruitment • Academy Director • Club Board • Other (please specify)
Does your club provide CPD opportunities and education courses to scouts/recruitment staff?	Simple Multiple Choice	• Yes • No • Unsure
What are the most important attributes for coaching and scouts/recruitment staff to possess in female football? Rank the following options by importance. a) Total experience b) Knowledge of club and philosophy c) Age-specific experience/knowledge d) Gender-specific experience/knowledge e) Formal education/qualifications f) Former playing experience	Matrix/Rating Scale	(1) Not at all important (2) Low importance (3) Neutral (4) Important (5) Very important
Do you face any of the following challenges when recruiting and developing talented players?	Checkboxes	• Competition from other clubs • Low staff numbers • Low staff working hours • Lack of experienced/qualified staff • Financial constraints • FA regulations • Small talent pool size • None of the above • Other (please specify)
How is the selection of players evaluated at your club?	Checkboxes	• Staff meetings • Via statistics (e.g., dropout rate, progression rate, performance levels) • Reflective Practice (critical self-refection with the intention to appraise working practices) • No evaluation procedure in place • Other (please specify)

How important do you think the following techniques are for evaluating talent identification and development processes? a) Staff meetings b) Statistics c) Reflective Practice	Matrix/Rating Scale	(1) Not at all important (2) Low importance (3) Neutral (4) Important (5) Very important

TALENT DEVELOPMENT – CHARACTERISTICS AND PROCESSES (9 Qs)

When developing talented players for your club at each age stage [7-11/12-16/17-21], how important are the following points? a) Developing players for the first team b) Developing players who could be sold on to other clubs for financial gain c) Having a positive impact on the personal development of players d) Remaining competitive across all competitions and ages	Matrix/Rating Scale	(1) Not at all important (2) Low importance (3) Neutral (4) Important (5) Very important
On an average week during the season, how many supervised (i.e., coach-led) training sessions do players aged [7-11/12-16/17-21] have?	Multiple Choice	• 1 • 2 • 3 • 4 • 5 • Other (please specify)
What is the average duration of these practice/training activities?	Multiple Choice	• 60 mins • 75 mins • 90 mins • 105 mins • 120 mins
What talent development processes does your club employ?	Checkboxes	• Frequent coaching sessions • Organised competition against other teams • Strength and conditioning support • Drill-based coaching activities • Games-based coaching activities • Fitness-based coaching activities • Small-sided games • Video-feedback sessions • Nutritional support • Psychological support • Educational support • Other (please specify)

Outside of player recruitment, does your club collect data in the following areas?	Checkboxes	• Physical (e.g. body composition, endurance, strength) • Psychological (e.g. motivation, coping, self-regulation) • Skill (e.g. technical, tactical, game intelligence) • Sociological (e.g. background, education) • Other data (please specify)
State (as close as possible) the number of players who have represented the academy for three years that have progressed to make an appearance for the first team since 2018 ("homegrown" players).	Free Text	
Is your club supported by TASS (Talented Athlete Scholarship Scheme) to provide educational support to players?	Simple Multiple Choice	• Yes • No • Unsure
Is your club partnered with a university to provide dual-career support?	Simple Multiple Choice	• Yes • No • Unsure
Does your club provide the following services to players? a) Dual registration (allowing players to register for another team to provide additional development opportunities) b) Residency programme c) Transportation services	Simple Multiple Choice	• Yes • No • Unsure

DESELECTION – CHARACTERISTICS AND PROCESSES (4 Qs)

State (as close as possible), the number of players that have been recruited and released/lost by your club in the last season for the following age groups [7-11/12-16/17-21].	Free Text	
Why do you feel you have lost these players?	Free Text	
What level of support does your club provide to players who drop out/are released from your club?	Matrix/Rating Scale	(1) None (2) Low (3) Moderate (4) High (5) Very high
Name the type and duration of support provided.	Free Text	

Appendix B: Supplementary data (Chapter Three)

Respondent Data

Number (frequency) of respondents reporting on soccer experience, female soccer experience, and working hours at WSL (*n* =7), WC (*n* = 8), and WNL (*n* = 11) league tiers.

	WSL	WC	WNL	All
Soccer Experience				
Under 1 year	0 (0%)	0 (0%)	0 (0%)	0 (0%)
1-2 years	0 (0%)	1 (13%)	0 (0%)	1 (4%)
2-5 years	0 (0%)	0 (0%)	1 (9%)	1 (4%)
5-10 years	1 (14%)	2 (25%)	2 (18%)	5 (19%)
10+ years	6 (86%)	5 (62%)	8 (73%)	19 (73%)
Female Soccer Experience				
Under 1 year	0 (0%)	0 (0%)	0 (0%)	0 (0%)
1-2 years	0 (0%)	1 (13%)	2 (18%)	3 (12%)
2-5 years	0 (0%)	1 (13%)	0 (0%)	1 (4%)
5-10 years	3 (43%)	3 (37%)	1 (9%)	7 (27%)
10+ years	4 (57%)	3 (37%)	8 (73%)	15 (57%)
Working Hours				
Full-time	5 (71%)	5 (63%)	8 (73%)	18 (69%)
Part-time	2 (29%)	3 (37%)	1 (9%)	6 (23%)
Voluntary	0 (0%)	0 (0%)	2 (18%)	2 (8%)

Club Structure Data

Number (frequency) of clubs reporting on the highest academy division, training provision and departments at WSL (*n* =7), WC (*n* = 8), and WNL (*n* = 11) clubs.

	WSL	WC	WNL	All Clubs
Highest Academy Division at Club				
PGA League	7 (100%)	5 (63%)	0 (0%)	12 (46%)
Junior Premier League (JPL)	0 (0%)	2 (25%)	2 (18%)	4 (15%)
National Reserve League	0 (0%)	1 (12%)	5 (46%)	6 (23%)
Regional Youth League	0 (0%)	0 (0%)	3 (27%)	3 (12%)
No Response	0 (0%)	0 (0%)	1 (9%)	1 (4%)
Training Provision				
Host an ETC	6 (86%)	6 (75%)	6 (55%)	18 (69%)
Pre-Academy (7-11 years)	6 (86%)	6 (75%)	9 (82%)	21 (81%)
Departments				
Medical	7 (100%)	7 (88%)	6 (55%)	20 (77%)
Sports Science	6 (86%)	6 (75%)	7 (64%)	19 (73%)
Psychology	6 (86%)	3 (38%)	4 (36%)	13 (50%)
Nutrition	5 (71%)	3 (38%)	4 (36%)	12 (46%)
Performance Analysis	3 (43%)	4 (50%)	5 (45%)	12 (46%)
Recruitment	3 (43%)	0 (0%)	2 (18%)	5 (19%)

Talent Identification

Median (IQR) importance rating of talent identification objectives at each age category and league tier from 1 (unimportant) to 5 (very important).

	WSL Median (IQR)	**WC** Median (IQR)	**WNL** Median (IQR)
Identifying players with the potential to play for the first team			
7-11	Important 4.0 (3.0-4.0)	Important 3.5 (3.0-4.0)	Moderately important 3.0 (1.0-3.5)
12-16	Important 4.0 (3.0-5.0)	Important 4.0 (4.0-4.0)	Important 4.0 (2.0-4.0)
17-21	Very important 5.0 (4.0-5.0)	Moderately important 3.0 (1.0-5.0)	Very important 5.0 (5.0-5.0)
Identifying players who could eventually be sold on to other clubs for financial gain			
7-11	Unimportant 1.0 (1.0-1.0)	Moderately important 3.0 (2.0-4.0)	Unimportant 1.0 (1.0-3.0)
12-16	Unimportant 1.0 (1.0-4.0)	Important 3.5 (3.0-4.5)	Unimportant 1.0 (1.0-4.0)
17-21	Of little importance 2.0 (1.0-4.0)	Moderately important 3.0 (2.0-4.0)	Unimportant 1.0 (1.0-3.0)
Identifying players to meet the needs of age-specific teams			
7-11	Important 4.0 (1.0-4.0)	Important 4 .0 (3.0-5.0)	Moderately important 3.0 (1.5-4.0)
12-16	Important 4.0 (4.0-5.0)	Important 4.0 (3.5-4.5)	Important 4.0 (2.0-4.0)
17-21	Very important 4.5 (4.0-5.0)	Important 4.0 (3.5-4.5)	Important 4.0 (2.0-5.0)
Identifying players best suited to the club's playing style			
7-11	Of little importance 2.0 (1.0-2.0)	Of little importance 2.0 (2.0-2.0)	Moderately important 3.0 (1.0-4.0)
12-16	Moderately important 3.0 (2.0-4.0)	Important 3.5 (3.0-4.0)	Moderately important 3.0 (2.0-4.0)
17-21	Important 4.0 (4.0-5.0)	Important 4.0 (4.0-4.5)	Moderately important 3.0 (3.0-4.0)

Number (frequency) of clubs employing talent identification processes throughout player development at WSL, WC, and WNL league tiers.

	WSL	WC	WNL
Observation in trials			
7-11	6 (100%)	6 (100%)	8 (89%)
12-16	7 (100%)	8 (100%)	11 (100%)
17-21	6 (86%)	8 (100%)	5 (45%)
Open-door scouting events			
7-11	4 (67%)	3 (50%)	4 (44%)
12-16	5 (71%)	2 (25%)	5 (45%)
17-21	2 (29%)	2 (25%)	5 (45%)
Performance analysis			
7-11	1 (17%)	0 (0%)	1 (11%)
12-16	4 (57%)	4 (50%)	3 (27%)
17-21	6 (86%)	6 (75%)	5 (45%)
Medical assessments			
7-11	0 (0%)	0 (0%)	0 (0%)
12-16	1 (14%)	1 (13%)	2 (18%)
17-21	5 (71%)	5 (63%)	4 (36%)
Psychological assessments			
7-11	0 (0%)	0 (0%)	0 (0%)
12-16	0 (0%)	1 (13%)	2 (18%)
17-21	2 (29%)	1 (13%)	3 (27%)
Physiological assessments			
7-11	1 (17%)	0 (0%)	1 (11%)
12-16	2 (29%)	2 (25%)	3 (27%)
17-21	3 (43%)	1 (13%)	3 (27%)
Physical assessments			
7-11	0 (0%)	0 (0%)	1 (11%)
12-16	3 (43%)	3 (38%)	5 (45%)
17-21	5 (71%)	7 (88%)	6 (55%)
Background assessments			
7-11	0 (0%)	0 (0%)	2 (22%)
12-16	0 (0%)	0 (0%)	2 (18%)
17-21	2 (29%)	2 (25%)	3 (27%)

Descriptive statistics for responses on registered players, player turnover, and homegrown players at WSL (n = 7), WC (n = 8), WNL (n = 11) league tiers.

	WSL	WC	WNL	All Clubs
Median (IQR) No. of Registered Players				
7-11	40 (23 to 60)	43 (40 to 60)	20 (18 to 30)	34 (20 to 45)
12-16	60 (45 to 65)	52 (48 to 78)	57 (50 to 60)	53 (46 to 68)
17-21	24 (22 to 25)	23 (18 to 25)	25 (18 to 40)	23 (19 to 28)
All	112 (75 to 144)	111 (77 to 140)	100 (90 to 108)	106 (89 to 133)
Median (IQR) No. of Players Recruited (last full season)				
7-11	19 (2 to 22)	40 (30 to 60)	19 (18 to 20)	20 (18 to 40)
12-16	10 (5 to 14)	26 (17 to 40)	40 (20 to 55)	21 (12 to 40)
17-21	7 (4 to 15)	13 (6 to 24)	8 (7 to 29)	8 (5 to 23)
All	19 (16 to 37)	84 (49 to 100)	67 (40 to 87)	62 (33 to 90)
Median (IQR) No. of Players Lost/Dismissed (last full season)				
7-11	4 (0 to 5)	8 (3 to 10)	4 (0 to 5)	5 (0 to 9)
12-16	8 (2 to 12)	9 (6 to 20)	14 (5 to 20)	8 (5 to 20)
17-21	8 (5 to 10)	5 (2 to 10)	5 (4 to 16)	6 (4 to 10)
All	14 (9 to 19)	19 (11 to 37)	22 (8 to 31)	19 (10 to 30)
Player Turnover Rate (last full season)				
7-11	21%	61%	66%	54%
12-16	15%	32%	46%	35%
17-21	37%	53%	54%	50%
All	22%	52%	55%	39%
Median (IQR) No. of 'Homegrown' Players				
Since 2018	12 (4 to 12)	6 (4 to 10)	4 (1 to 24)	6 (3 to 12)
Per Season	2 (1 to 2)	1 (1 to 2)	1 (0 to 5)	1 (1 to 2)

Descriptive statistics for the recruitment decision-making process at WSL (*n* = 7), WC (*n* = 8), WNL (*n* = 11) league tiers.

	WSL	WC	WNL	All Clubs
No. (Frequency) of staff involved in the identification and selection of players				
Coaches	7 (100%)	7 (88%)	10 (91%)	24 (92%)
Academy Director	7 (100%)	6 (75%)	5 (45%)	18 (69%)
Scouts	3 (43%)	0 (0%)	2 (18%)	5 (19%)
Head of Recruitment	1 (14%)	1 (13%)	1 (9%)	3 (12%)
Club Board	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Other Role	0 (0%)	0 (0%)	1 (9%)	1 (4%)
No. (Frequency) of staff responsible for the final decision to recruit a player				
Coaches	4 (57%)	2 (25%)	7 (64%)	13 (50%)
Academy Director	6 (86%)	7 (88%)	6 (55%)	19 (73%)
Scouts	0 (0%)	0 (0%)	0 (0%)	0 (0%)
Head of Recruitment	0 (0%)	1 (13%)	2 (18%)	3 (12%)
Club Board	1 (14%)	0 (0%)	0 (0%)	1 (4%)
Other Role	0 (0%)	0 (0%)	1 (9%)	1 (4%)

Descriptive statistics for recruitment evaluation techniques at WSL (*n* = 7), WC (*n* = 8), WNL (*n* = 11) league tiers.

	WSL	WC	WNL	All Clubs
No. (Frequency) of Clubs Using Techniques to Evaluate Player Recruitment				
Staff meetings	4 (57%)	7 (88%)	9 (82%)	20 (77%)
Statistics	5 (63%)	5 (63%)	4 (36%)	14 (54%)
Reflective Practice	4 (57%)	6 (75%)	7 (64%)	17 (65%)
None	1 (14%)	1 (13%)	1 (9%)	3 (12%)
Median (IQR) Importance Rating of Recruitment Evaluation Techniques				
Staff meetings	5 (4 to 5)	5 (4 to 5)	4 (4 to 5)	4 (4 to 5)
Statistics	4 (3 to 4)	4 (3 to 4)	4 (4 to 4)	4 (3 to 4)
Reflective Practice	4 (4 to 4)	5 (4 to 5)	4 (4 to 5)	4 (4 to 5)

Talent Development

Median (IQR) importance rating of talent development objectives at each age category and league tier from 1 (unimportant) to 5 (very important).

	WSL	WC	WNL
Developing players with the potential to play for the first team			
7-11	Moderately important 3.0 (2.0-4.0)	Moderately important 3.0 (2.0-4.0)	Moderately important 3.0 (1.5-4.0)
12-16	Important 4.0 (4.0-4.0)	Important 4.0 (4.0-4.0)	Important 4.0 (4.0-4.0)
17-21	Very important 5.0 (5.0-5.0)	Very important 5.0 (4.5-5.0)	Very important 5.0 (4.0-5.0)
Developing players who could eventually be sold on to other clubs for financial gain			
7-11	Unimportant 1.0 (1.0-1.0)	Of little importance 1.5 (1.0-3.0)	Unimportant 1.0 (1.0-3.5)
12-16	Unimportant 1.0 (1.0-3.0)	Moderately important 2.5 (1.0-3.0)	Unimportant 1.0 (1.0-4.0)
17-21	Of little importance 2.0 (1.0-4.0)	Important 3.5 (2.0-4.0)	Unimportant 1.0 (1.0-4.0)
Having a positive impact upon the personal development of players			
7-11	Very important 5.0 (5.0-5.0)	Very important 4.5 (4.0-5.0)	Very important 5.0 (3.5-5.0)
12-16	Very important 5.0 (5.0-5.0)	Very important 5.0 (4.0-5.0)	Very important 5.0 (4.0-5.0)
17-21	Very important 5.0 (5.0-5.0)	Very important 5.0 (4.0-5.0)	Very important 5.0 (4.0-5.0)
Remaining competitive across all competitions and ages			
7-11	Moderately important 3.0 (3.0-4.0)	Moderately important 3.0 (1.0-4.0)	Of little importance 2.0 (2.0-3.0)
12-16	Important 4.0 (3.0-4.0)	Important 4.0 (3.0-4.0)	Important 4.0 (3.0-4.0)
17-21	Important 4.0 (4.0-4.0)	Important 4.0 (3.5-5.0)	Important 4.0 (3.0-5.0)

Descriptive statistics for the TD processes used within WSL (n = 7), WC (n = 8), and WNL (n = 10) league tiers. Due to missing data, findings are presented for 10 WNL clubs.

	WSL	WC	WNL	All Clubs
No. (Frequency) of Clubs Employing Talent Development Processes				
Frequent Coaching Sessions	7 (100%)	8 (100%)	10 (100%)	25 (100%)
Organised Competition	7 (100%)	8 (100%)	10 (100%)	25 (100%)
Strength and Conditioning	7 (100%)	8 (100%)	7 (70%)	22 (88%)
Drill-based Practice Activities	5 (71%)	7 (88%)	7 (70%)	19 (76%)
Games-based Practice Activities	7 (100%)	8 (100%)	10 (100%)	25 (100%)
Fitness-based Practice Activities	6 (86%)	8 (100%)	9 (90%)	23 (92%)
Small-sided Games	7 (100%)	7 (88%)	10 (100%)	24 (96%)
Performance Analysis	6 (86%)	8 (100%)	5 (50%)	19 (76%)
Nutritional Support	5 (71%)	6 (75%)	2 (20%)	13 (52%)
Psychological Support	5 (71%)	2 (25%)	4 (40%)	11 (44%)
Educational Support	6 (86%)	6 (75%)	6 (60%)	18 (72%)
No. (Frequency) of Clubs Collecting Attribute Data on Players				
Physical	7 (100%)	7 (88%)	6 (60%)	20 (80%)
Psychological	3 (43%)	2 (25%)	5 (50%)	10 (40%)
Skill	5 (71%)	6 (75%)	7 (70%)	18 (72%)
Sociological	4 (57%)	3 (38%)	3 (30%)	10 (40%)
None	0 (0%)	1 (13%)	1 (10%)	2 (8%)

Median (IQR) number and duration of weekly practice sessions at each league tier.

	WSL	WC	WNL
No. of weekly practice sessions			
7-11	2.0 (2.0-2.0)	1.0 (1.0-2.0)	1.0 (1.0-2.0)
12-16	3.0 (3.0-3.0)	2.5 (2.0-3.0)	2.0 (1.0-3.0)
17-21	4.0 (4.0-4.0)	3.0 (3.0-5.0)	3.0 (2.0-3.0)
Duration (mins) of weekly practice sessions			
7-11	90.0 (60.0-120.0)	90.0 (90.0-90.0)	90.0 (60.0-97.5)
12-16	105.0 (90.0-120.0)	112.5 (90.0-120.0)	90.0 (90.0-120.0)
17-21	90.0 (90.0-120.0)	120.0 (90.0-120.0)	120.0 (90.0 -120.0)

The number (frequency) of clubs experiencing challenges when developing talented youth players at WSL, WC, and WNL league tiers. Due to missing data, findings are presented for 10 WNL clubs.

	WSL	WC	WNL	All Clubs
Financial constraints	4 (57%)	8 (100%)	9 (90%)	21 (84%)
Competition from other clubs	5 (71%)	7 (88%)	7 (70%)	19 (76%)
Low staff numbers	2 (29%)	4 (50%)	6 (60%)	12 (48%)
Low staff working hours	2 (29%)	5 (63%)	4 (40%)	11 (44%)
Lack of qualified staff	2 (29%)	3 (38%)	5 (50%)	10 (40%)
FA regulations	3 (43%)	3 (38%)	4 (40%)	10 (40%)
Small talent pool size	2 (29%)	4 (50%)	3 (30%)	9 (36%)

Median (IQR) importance rating of staff attributes at each league tier.

	WSL	WC	WNL	All Clubs
Total Experience	4 (3-5)	4 (4-4)	4 (4-4)	4 (4-4)
Knowledge of Club and Philosophy	4 (3-4)	4 (3-4)	4 (4-5)	4 (3-4)
Age-specific Experience/Knowledge	4 (4-5)	4 (4-4)	4 (4-5)	4 (4-4)
Gender-specific Experience/Knowledge	4 (4-4)	4 (4-4)	4 (3-5)	4 (4-4)
Formal Coaching Qualifications	3 (3-4)	4 (3-4)	4 (4-4)	4 (3-4)
Former Playing Experience	2 (2-3)	2 (2-3)	2 (2-3)	2 (2-3)

Descriptive statistics of club provisions for players and staff at WSL, WC, and WNL league tiers. Due to missing data, findings are presented for 10 WNL clubs.

	WSL	WC	WNL	All Clubs
No. (Frequency) of Club Provisions for Players				
TASS Partnership	5 (71%)	4 (50%)	3 (30%)	12 (48%)
University Partnership	5 (71%)	4 (50%)	2 (20%)	11 (44%)
Dual-Registration	7 (100%)	8 (100%)	10 (100%)	25 (100%)
Residency Programme	3 (43%)	0 (0%)	2 (20%)	5 (20%)
Transportation Services	6 (86%)	0 (0%)	5 (50%)	11 (44%)
No. (Frequency) of Club Provisions for Staff				
CPD for Coaches	6 (86%)	7 (88%)	10 (91%)	23 (88%)
CPD for Recruitment Staff	3 (43%)	0 (0%)	5 (45%)	8 (31%)

Loss of Players

Reasons and examples provided by clubs for the loss of players within the last full season.

	Count	Example (League Tier)
Player-initiated Departures	**24**	
Transferred to Other Clubs	8	*"Players aged 17-21 have signed at other clubs with PGA U21 team"* (WC) *"Players have chosen to move to different clubs for a greater challenge"* (WNL)
University/USA Scholarships	6	*"To USA scholarships, or to university in England"* (WSL) *"Players moved to America on college scholarships."* (WC)
Other Commitments	5	*"Around 3 left to do something else (different sport)"* (WC)
Travel Demands	3	*"Players have chosen to move to different clubs due to location/travel"* (WNL)
Personal Circumstances	2	*"Injury"* (WC)
Club-initiated Releases	**20**	
Lacking Quality Required	8	*"Players not good enough to play WSL"* (WSL) *"Released based on assessment of the coaching staff"* (WC)
Deselection	5	*"Not selected for a professional contract in house"* (WSL)
Talent Pathway Structure	4	*"12-16 - single band age group U-14's transition into dual age-band at U-16's therefore the squad selection drops from 18 available places to 9"* (WSL) *"12-16 years - filtering from single age group (U14) to dual age group (U16) caused 10 of our players to be released"* (WC)
Replaced due to Improved Recruitment	2	*"Selection of U16's can be lower due to recruitment tools/resources available when recruiting U21's"* (WSL)
Players Aging	1	*"Players heading into their 20s"* (WSL)

Support processes provided by clubs to released players.

	Count	Examples (Tier)
Exit Pathway Process	10	*"Performance review and plan analysis, second indication review and support, final decisions and exit options/support"* (WSL) *"Deregister process begins in the new year and finishes March time including initial indication and performance plan"* (WSL)
Securing Alternate Opportunities	9	*"If a player is released, we help them get connected with teams in the area, but we do not follow up in the next weeks/months to see how they are getting on"* (WC) *"Limited resource means we don't provide in-depth support after exit. Signposting to grassroots teams and making connections with them if needed"* (WC)
Follow-up with Player	3	*"We have 1-2 check ins with players who have been released to make sure they have found another place to play"* (WC) *"Follow up/ try to attend games of new clubs where applicable"* (WC)
Psychological and Wellbeing Support	2	*"We work with every player 1 to 1 to support their wellbeing"* (WSL)
Other	3	*"1st team do support players sometimes"* (WNL)

Appendix C: Participation History Questionnaire (PHQ)

LIVERPOOL JOHN MOORES UNIVERSITY

Football Playing History Survey

Why have I been asked to complete?

- We would like to understand how female football players become experts/professionals and the activities which contribute towards their development.
- You have been invited because you have been highlighted as currently playing in professional football.
- If you are under the age of 16, you should **NOT** complete this questionnaire.

Do I have to take part?

- No. It is up to you to decide whether to take part.
- If you do decide to take part, you can withdraw at any time by simply stopping completing the questionnaire.

What are the possible benefits of taking part?

- We (and your club) would like to know more about talent development professional female football and how you (and your teammates) have made it to the professional game. It is hoped that this work can be used as guidelines in designing and developing future talent development programmes.

What will happen to this survey after I complete it?

- No names or any other personal/identifiable data is collected from the LJMU side. This front sheet will be removed by your coach and not passed on to LJMU.

Implied consent

- By completing this survey, you are agreeing that you are happy to participate, and you understand that you are consenting to be part of our research study and for your data to be used (19/SPS/012).

Information

- If you have any questions or would like any further information. Please contact Matthew Andrew (Tel: 07908334648; Email: m.andrew@ljmu.ac.uk).

Name: _____

Number **(for coach use only):** _____

Milestones

This section is designed to understand key milestones in your football journey.

General

Date of birth:	**M:**	**D:**	**Y:**
What is your place of birth? *If this is outside of the UK, please specify the country.*			
Do you have any siblings? *If so, are they older/younger, by how much?*	Younger:	Older:	
How would you best describe the area you grew up in? *This would be the area you lived during the majority of the time. Please circle.*	Inner City	Suburbs	Rural
Did any of you parents/guardians play, or currently play sport? *This can be recreational (e.g., game of tennis with friends)*	1. 2. 3.		
Which team do you primarily play for? (e.g., 1st-team, development)			
What age did you first start playing football (i.e., not organised)? *Your first practice session for a team or playing in a physical education lesson.*			
What age did you first football training supervised by an adult/coach? *Your first session for an organised team supervised by an adult/coach.*			
What age did you first play in an organised football league? *This would be your first competitive game playing for an organised team.*			
What age did you start strength training regularly (e.g., gym)? *This would be with a coach/adult or on your own to support your football.*			
What age did you join an elite team (e.g., academy/college team)? *This would be when you are playing at the highest level for your age group.*			
What age did you sign your first senior football contract?			
What type of contract was this? (e.g., pro, dual-career, voluntary)			
What age did you make you first appearance for a senior team? *This would be either starting or from the bench (e.g., your WSL/CHMP debut).*			
What age did you first represent your country? *This could be youth (U17) and would be either starting or from the bench.*			
What age did you first represent your country at senior level? *This could be either starting or from the bench.*			

Football Activity

The next second section is deigned to understand the amount of time spent in football-related activities across your journey. We would also like to know how physically and mentally demanding these activities where.

Please turn over to the next page.

17-18 Years of Age

What was the predominant gender of your team? (please circle)			Male	Female	Mixed
What league was this (e.g., academy, junior, high-school)?					
How many weeks did you spend injured? and what was the injury? *Time where you did not take part in football related activity due to injury.*					
Coach-led practice *Organised group practice supervised by coaches/adults e.g., practice with team.*					
On average how many hours/sessions per week did you spend in coach led practice?					
How *enjoyable* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *motivating* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
Individual Practice *Practice alone (e.g., turning with the ball; shooting into open goal)*					
On average how many hours/sessions per week did you spend in individual practice?					
How *enjoyable* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *motivating* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
Peer-led play *Play games with rules supervised by your friends/peers (e.g., game of football with friends)*					
On average how many hours/sessions per week did you spend in play?					
Where did this play take place? *This could be AstroTurf, 5 v 5 (e.g. ages) or playing fields etc.*					
How *enjoyable* did you find play? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find play? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find play? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *motivating* did you find play? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
Match-play *Organised competition in a group supervised by adult(s) (e.g., league games, international games etc).*					
On average how many hours/matches per week did you play?					
How *enjoyable* did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *motivating* did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very

15-16 Years of Age

What was the predominant gender of your team? (please circle)			Male	Female	Mixed
What league was this (e.g., academy, junior, high-school)?					
How many weeks did you spend injured? and what was the injury? *Time where you did not take part in football related activity due to injury.*					
Coach-led practice *Organised group practice supervised by coaches/adults e.g., practice with team.*					
On average how many hours/sessions per week did you spend in coach led practice?					
How *enjoyable* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *motivating* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
Individual Practice *Practice alone (e.g., turning with the ball; shooting into open goal)*					
On average how many hours/sessions per week did you spend in individual practice?					
How *enjoyable* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *motivating* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
Peer-led play *Play games with rules supervised by your friends/peers (e.g., game of football with friends)*					
On average how many hours/sessions per week did you spend in play?					
Where did this play take place? *This could be AstroTurf, 5 v 5 (e.g. ages) or playing fields etc.*					
How *enjoyable* did you find play? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find play? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
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Match-play *Organised competition in a group supervised by adult(s) (e.g., league games, international games etc).*					
On average how many hours/matches per week did you play?					
How *enjoyable* did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *motivating* did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very

13-14 Years of Age

What was the predominant gender of your team? (please circle)			Male	Female	Mixed
What league was this (e.g., academy, junior, high-school)?					
How many weeks did you spend injured? and what was the injury? *Time where you did not take part in football related activity due to injury.*					
Coach-led practice *Organised group practice supervised by coaches/adults e.g., practice with team.*					
On average how many hours/sessions per week did you spend in coach led practice?					
How *enjoyable* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
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How *motivating* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
Individual Practice *Practice alone (e.g., turning with the ball; shooting into open goal)*					
On average how many hours/sessions per week did you spend in individual practice?					
How *enjoyable* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
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Peer-led play *Play games with rules supervised by your friends/peers (e.g., game of football with friends)*					
On average how many hours/sessions per week did you spend in play?					
Where did this play take place? *This could be AstroTurf, 5 v 5 (e.g. ages) or playing fields etc.*					
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Match-play *Organised competition in a group supervised by adult(s) (e.g., league games, international games etc).*					
On average how many hours/matches per week did you play?					
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How *physically* challenging did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *motivating* did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very

11-12 Years of Age

What was the predominant gender of your team? (please circle)			Male	Female	Mixed
What league was this (e.g., academy, junior, high-school)?					
How many weeks did you spend injured? and what was the injury? *Time where you did not take part in football related activity due to injury.*					
Coach-led practice *Organised group practice supervised by coaches/adults e.g., practice with team.*					
On average how many hours/sessions per week did you spend in coach led practice?					
How *enjoyable* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
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On average how many hours/sessions per week did you spend in play?					
Where did this play take place? *This could be AstroTurf, 5 v 5 (e.g. ages) or playing fields etc.*					
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How *physically* challenging did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *mentally* challenging did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *motivating* did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very

9-10 Years of Age

What was the predominant gender of your team? (please circle)			Male	Female	Mixed
What league was this (e.g., academy, junior, high-school)?					
How many weeks did you spend injured? and what was the injury? *Time where you did not take part in football related activity due to injury.*					
Coach-led practice *Organised group practice supervised by coaches/adults e.g., practice with team.*					
On average how many hours/sessions per week did you spend in coach led practice?					
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Peer-led play *Play games with rules supervised by your friends/peers (e.g., game of football with friends)*					
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7-8 Years of Age

What was the predominant gender of your team? (please circle)			Male	Female	Mixed
What league was this (e.g., academy, junior, high-school)?					
How many weeks did you spend injured? and what was the injury? *Time where you did not take part in football related activity due to injury.*					
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On average how many hours/sessions per week did you spend in play?					
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5-6 Years of Age

What was the predominant gender of your team? (please circle)			Male	Female	Mixed
What league was this (e.g., academy, junior, high-school)?					
How many weeks did you spend injured? and what was the injury? *Time where you did not take part in football related activity due to injury.*					
Coach-led practice *Organised group practice supervised by coaches/adults e.g., practice with team.*					
On average how many hours/sessions per week did you spend in coach led practice?					
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Individual Practice *Practice alone (e.g., turning with the ball; shooting into open goal)*					
On average how many hours/sessions per week did you spend in individual practice?					
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Peer-led play *Play games with rules supervised by your friends/peers (e.g., game of football with friends)*					
On average how many hours/sessions per week did you spend in play?					
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How *motivating* did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very

Other Sports

The final section is deigned to understand any 'other' sporting activities you have engaged outside of football.

What sports did you engage in during school physical education lessons?
Please tick all sports which you engaged in during school. There is space to add sports.

Athletics		**Golf**		**Rugby/Gaelic**		**Tennis**	
Badminton		**Gymnastics**		**Running/X-country**		**Volleyball**	
Baseball/Softball		**Handball**		**Swimming**		**Water polo**	
Basketball		**Hockey**		**Skiing/ Snowboarding**		**Weights/X-training**	
Boxing/Kick boxing		**Judo/Karate**		**Yoga/Pilates**		**Other**	
Cricket		**Lacrosse**		**Table tennis**		**Other**	

What sports did you engage in <u>outside</u> of physical education lessons?
These are sports that you engage in outside of your football team and physical education lessons. We are also interested to know what level (e.g., national) you played at.

Please turn over to the next page.

Sport 1

Sport					
What was the highest level you competed (e.g., recreational; national)?					
On average how months per year did you spend in this sport?					
Coach-led practice *Organised group practice supervised by coaches/adults e.g., practice with team.*					
On average how many hours/sessions per week did you spend in coach led practice?					
How *enjoyable* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
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On average how many hours/sessions per week did you spend in individual practice?					
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Where did this play take place? *This could be AstroTurf, 5 v 5 (e.g. ages) or playing fields etc.*					
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Sport 2

Sport					
What was the highest level you competed (e.g., recreational; national)?					
On average how months per year did you spend in this sport?					
Coach-led practice *Organised group practice supervised by coaches/adults e.g., practice with team.*					
On average how many hours/sessions per week did you spend in coach led practice?					
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How *motivating* did you find matches? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very

Sport 3

Sport					
What was the highest level you competed (e.g., recreational; national)?					
On average how months per year did you spend in this sport?					
Coach-led practice *Organised group practice supervised by coaches/adults e.g., practice with team.*					
On average how many hours/sessions per week did you spend in coach led practice?					
How *enjoyable* did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
How *physically* challenging did you find practice? *Please circle a value between 1 and 5.*	1 Not at all	2	3	4	5 Very
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Appendix D: Interview Guide (Chapter Five)

Practice Activities and Coach Behaviours - Standardised Interview/Feedback Session Guide

Follow-up interviews to be conducted post data collection and analysis, lasting approx. 30-60 minutes. Coaches will receive feedback on their coaching behaviours and activities (individual and group). Interviews will gain insight into why coaches do what they do regarding session structure and exhibited coach behaviours.

Interviews will start with general questions on planning and overall thoughts on the research findings on a group level. Coaches will then be presented with and questioned on their individual data, using video feedback for context. Finally, coaches will be asked general questions relating to talent development issues within female soccer.

[Overall findings to be presented to coaches during a group feedback session]

[Interview data to be collected during recorded individual feedback sessions]

[Profile information (experience, gender, qualifications etc.) will have been collected via an online survey]

Introduction:

- Firstly, thank you for participating in the overall research project and for taking the time to talk to me today.
- As you know I am currently studying at Liverpool John Moores University investigating factors influencing talent development in female youth football.
- Over the last few months I have been recording your coaching sessions and analysing how you structure these sessions and your behaviours and verbalisations during these sessions.
- I want to highlight that I am not here to tell you how to coach and what may be right or wrong about your coaching, instead this is an opportunity to understand your coaching more, and learn what you do and why (more like a CPD opportunity).
- Just a reminder that your name will be removed/replaced with a pseudonym and your comments will remain anonymous.

Interview Schedule
Coach Activities - Planning
1. Can you talk me through how you typically plan your coaching sessions? *How long do you spend planning your coaching sessions?* *How do you decide what activities to include within the session?* *What considerations do you have to make when planning your coaching sessions?* 2. Do your plans ever change during the session? If so, what are the reasons for this?
Coach Activities - Structure
3. Could you describe your working relationship with the other coach you work with?

When both of you are present, how do you structure the sessions? Who decides how to structure sessions?

4. Before I show you your individual findings, how would you describe the structure of your coaching sessions?
   What proportion of the session do you think you spend in Drill-based/Games-based/Transition?

[PRESENT INDIVIDUAL ACTIVITY FINDINGS TO COACH]

5. Are you surprised by these findings? Why/Why not?
   Would you change your coaching sessions based on these findings?

6. These findings show a higher proportion of time is spent in games-based activities compared to drill-based practice. What do you think are the reasons for this finding?

7. [These questions may change according to individual coach findings]
   In your sessions, time spent in [games-based activities/drill-based activities/transition] was [higher/lower] than the overall academy average. What do you think are the reasons for this?

Coach Behaviours – Observation Findings

8. Of these behaviours [display behaviours], which ones do you think are the most frequently observed during your practice sessions?

9. How aware are you of your own behaviours and verbalisations during your practice sessions?

[PRESENT INDIVIDUAL BEHAVIOUR FINDINGS TO COACH]

10. Are you surprised by these findings? Why/Why not?
    Would you change your coaching behaviours based on these findings?

Coach Behaviours - Stimulated Recall

[SHOW EXAMPLES OF SPECIFIC BEHAVIOURS USED BY COACH DURING SESSIONS – STIMULATED RECALL]

11. Approx. 5-10 questions specific to certain behaviours – for example:
    Silence was the most frequent behaviour for all coaches/yourself, why do you think this is the case? (is silence used intentionally?)
    The praise to scold ratio is approximately 12:1, what do you think is the reason for this? What impact do you think this has on players?
    When questioning players, you used divergent (explain) questioning twice as much as convergent (explain) questioning? What is the reason for this?
    Describe your use of questioning behaviours. What impact do you think this has on player development?

General Talent Development Issues

Gender-specific Coaching

12. What are the most important considerations when coaching talented female youth players?

13. What coaching behaviours do you think female players best respond to during training sessions?

14. Do you have experience coaching male youth players?
    If yes, what are the key similarities or differences between coaching male players compared to female players?

Age-specific Coaching

15. Do you actively change or adapt your coaching activities/behaviours depending on the age group you are coaching?
    If yes, how does this change/what do you change?
    If no, why not?

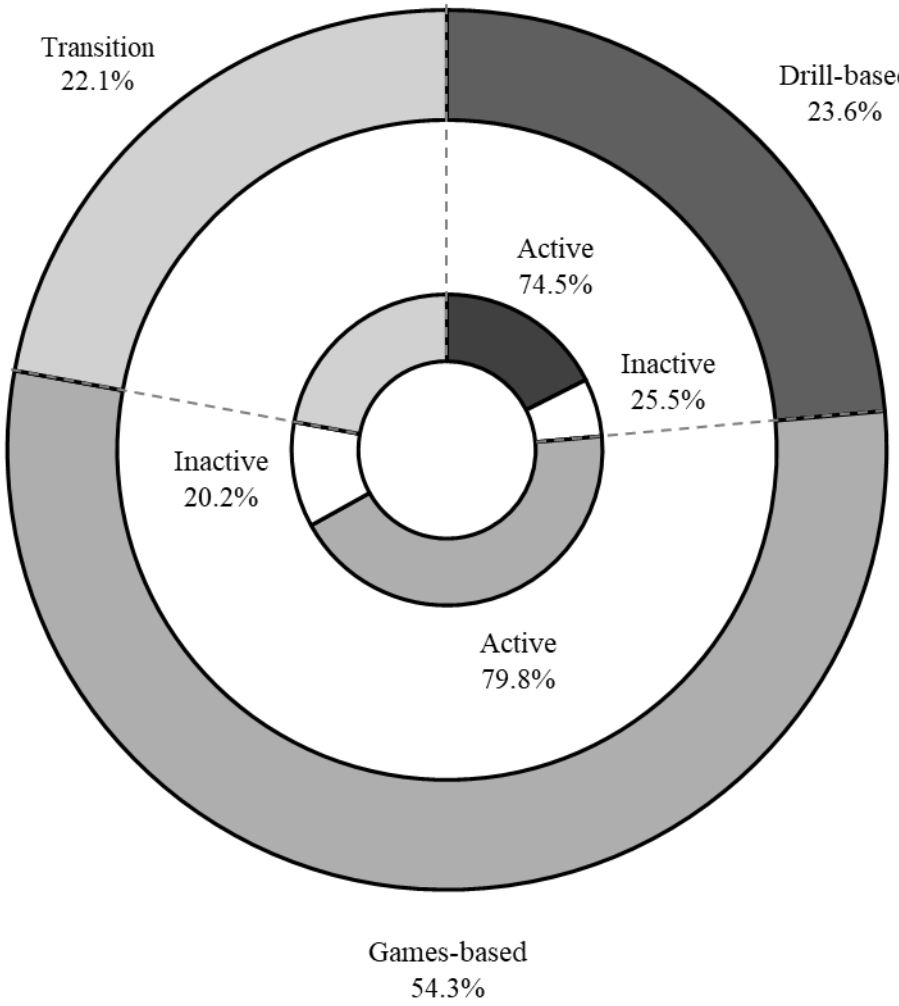
Coach Gender

16. How do you think players respond to a male coach compared to a female coach during practice sessions?

Self-improvement

17. Do you do anything to improve your coaching?
    If yes, please describe this process. What methods do you use? How much time do you dedicate to this process?
    If no, are there any barriers you face that may prevent this process?

Appendix E: Supplementary data (Chapter Five)



Mean percentage of coach-led practice sessions spent within each activity state (outer ring) and spent active (i.e., ball-rolling) or inactive (i.e., session frozen; group huddle) within each activity type (inner ring).

Behaviours employed by coaches within practice sessions (total behaviours, rate per minute (RPM), duration of behaviours per session, and percentage of behaviours per session).

Behaviour	Total				RPM				Duration Per Session (s) ± SD	% Per Session
	Drill-based	Games-based	Transition	All	Drill-based	Games-based	Transition	All		
Pre-instruction	240	241	470	951	[a] 0.41	[b] 0.22	[a,b] 0.96	0.45	298 ± 180	8.1
Concurrent Instruction	1,501	3,371	50	4,922	[a] 2.49	[b] 3.12	[a,b] 0.11	2.39	340 ± 177	9.5
Post-instruction	116	368	146	630	0.21	0.32	0.25	0.31	134 ± 106	3.7
Instruction (Total)	1,857	3,980	666	6,503	3.11	3.65	1.32	3.14	772 ± 109	21.2
Convergent Questioning	90	213	264	567	[a] 0.15	[b] 0.20	[a,b] 0.50	0.28	42 ± 37	1.2
Divergent Questioning	118	424	231	773	0.22	0.37	0.45	0.39	73 ± 74	2.0
Questioning (Total)	208	637	495	1,340	0.37	0.57	0.95	0.67	115 ± 22	3.2
Positive Feedback	155	658	34	847	[a] 0.26	[b] 0.65	[a,b] 0.06	0.43	67 ± 37	2.1
Negative Feedback	106	174	18	298	0.18	0.17	0.03	0.15	36 ± 28	1.0
Corrective Feedback	137	254	14	405	0.20	[b] 0.24	[b] 0.03	0.21	99 ± 79	3.0

Knowledge of Results	18	123	11	152	0.04	0.12	0.02	0.07	13 ± 17	0.4
Knowledge of Perform.	21	77	27	125	0.04	0.07	0.05	0.06	41 ± 41	1.2
Praise	981	1,527	115	2,623	[a] 1.76	[b] 1.47	[a,b] 0.22	1.25	102 ± 54	2.9
Scold	86	223	39	348	[c] 0.13	[c] 0.22	0.08	0.17	23 ± 14	0.7
Positive Reinforcement	50	151	94	295	0.09	0.14	0.17	0.14	14 ± 12	0.4
Negative Reinforcement	1	10	19	30	0.00	0.01	0.03	0.01	5 ± 17	0.1
Feedback (Total)	1,555	3,197	371	5,123	2.71	3.09	0.68	2.49	400 ± 37	11.7
Positive Modelling	106	54	28	188	[a] 0.15	0.04	[a] 0.06	0.08	48 ± 62	1.3
Negative Modelling	24	16	6	46	0.04	0.01	0.01	0.02	9 ± 11	0.2
Player Participation	41	45	27	113	0.07	0.03	0.05	0.05	45 ± 56	1.1
Demonstration (Total)	171	115	61	347	0.26	0.09	0.13	0.15	102 ± 22	2.6
Management	226	399	669	1,294	[a] 0.39	[b] 0.35	[a,b] 1.31	0.59	188 ± 93	5.3
Colleague Interaction	107	226	158	491	0.23	0.19	0.28	0.22	163 ± 156	4.4
Organisation (Total)	333	625	827	1,785	0.63	0.53	1.59	0.81	351 ± 18	9.6
Silence – On-task	789	3,013	128	3,930	[a,c] 1.62	[b,c] 2.75	[a,b] 0.28	1.90	1,102 ± 642	29.3

Silence – Off-task	175	105	437	717	[c] 0.38	[b,c] 0.09	[b] 0.80	0.32	336 ± 250	9.0
Colleague Intervention	37	48	65	150	0.07	0.04	0.14	0.07	103 ± 173	2.6
Silence (Total)	1,001	3,166	630	4,797	2.07	2.89	1.22	1.80	1,541 ± 523	40.8
Hustle	491	564	112	1,167	0.85	0.60	0.24	0.58	59 ± 48	1.7
Humour	110	226	150	486	0.22	[b] 0.24	[b] 0.34	0.26	53 ± 40	1.7
Uncodable	519	880	647	2,046	[a] 0.88	[b] 0.81	[a,b] 1.29	0.97	261 ± 214	7.6
Other (Total)	1,120	1,670	909	3,699	1.95	1.65	1.87	1.80	373 ± 118	10.9

Note:

[a] *significant difference between drill-based activities and transition*

[b] *significant difference between games-based activities and transition*

[c] *significant difference between drill-based and games-based activities*