# Maximising Potential Through the Pathway: An Interdisciplinary and Mixed-Methods Investigation of Player Development in Irish Male Football

## Liam Sweeney, BSc (Hons), MSc (Hons)

**Supervisors:** Dr Áine MacNamara and Dr Jamie Taylor

## Student Declaration

I hereby certify that this material, which I now submit for assessment on the programme of study leading to the award of PhD is entirely my own work, and that I have exercised reasonable care to ensure that the work is original, and does not to the best of my knowledge breach any law of copyright, and has not been taken from the work of others save and to the extent that such work has been cited and acknowledged within the text of my work.

**Signature of Candidate:**

**Student ID Number**: 20215185

**Date**: 4th May 2023

# Acknowledgements

To my fantastic supervisors, Áine and Jamie, from the bottom of my heart, thank you. You have been more than just supervisors; you have taught, mentored, advised, guided, and provided me with the insight, support, and opportunities to be the best that I can be (and been very, very patient in doing so!!). From the many emails, zoom calls, meetings, phone calls, voice notes, and text messages, you have provided a level of support that goes miles beyond what I could have wished for, and means more to me than I can express. I consider myself privileged to have been mentored by you both, and I will be forever grateful.

To Dan Horan, thank you for making this possible. You have mentored me, both personally and professionally, and you have gone above and beyond to support me. Your guidance and support of my research has been invaluable, and I am eternally grateful. It was a privilege to work with you.

Thank you to the Irish Research Council for funding and promoting this research.

To all my fellow PhD researchers that I have shared the office with; thank you for being part of my journey. Thank you for listening to me, guiding me, and showing an interest in my work. Most importantly, I consider you all friends for life and I thank you for that.

To the Football Association of Ireland and the brilliant coaches and academy managers that I have worked with, thank you for supporting the project and for your help during the data collection processes. A special thank you to Niall Harrison for promoting and facilitating the research throughout the association.

Thank you to all the coaches, parents, guardians, and players that I have worked with throughout the course of this PhD. Without you, this research project would not have been possible. I will be forever grateful for your contributions to my journey.

To my special parents, Patrick and Sonia, I cannot truly articulate how much your love and support has meant to me. Without your constant support, guidance and care, this journey would not have been possible. We have spoken every single day since I started this PhD, and our chats mean the world to me. You have taught me to always give the best account of myself each day and to be ambitious, and with these principles, anything is possible. You are my motivation and I hope you are proud. To my brother Cian, I have learnt so much from you throughout this PhD and you have provided so much advice and guidance (and technological support!!) that has been invaluable. Thank you for always being there for me.

Finally, Angelica; my partner and my best friend. It is impossible to put into words just how much you mean to me. The support that you have given me throughout this journey is the reason that I have reached this stage. I remember celebrating with you in Stockholm when we found out that I was beginning this journey, and you have been there for me every day since, from Hitchin to Tyresö to Craughwell to Clondalkin! Your companionship, advice, love, guidance, humour, intelligence, and empathy through both the good times and the bad have meant everything. Låt framtiden och nästa kapitel av vår resa börja, jag älskar dig!

# Table of Contents

# List of Figures

# List of Tables

**List of Abbreviations**

| Abbreviation | Definition |
| --- | --- |
| ATDE | Athletic Talent Development Environment |
| CGS | Centimetres, Grams, Seconds |
| DMGT | Differentiated Model of Giftedness and Talent |
| DPB | Discrete Performance Banding |
| DDSL | Dublin District Schoolboy League |
| FAI | Football Association of Ireland |
| FAIC | Football Association of Ireland National Academy Coaches |
| FIFA | Federation Internationale de Football Association |
| IRE13 | Football Association of Ireland National Academy Under 13 Cohort |
| IRE15 | Football Association of Ireland Under 15 National team |
| IRE16 | Football Association of Ireland Under 16 National team |
| NGB | National Governing Body |
| NL | National Leagues |
| NLC | National League Coaches |
| PCDEs | Psychological Characteristics of Developing Excellence |
| PJDM | Professional Judgement and Decision Making |
| RAE | Relative Age Effect |
| RTA | Reflexive Thematic Analysis |
| SC | Schoolboy Football Coaches |

| | |
|---|---|
| SD | Standard Deviation |
| SFAI | Schoolboy Football Association of Ireland |
| SMM | Shared Mental Model |
| TD | Talent Development |
| TDE | Talent Development Environment |
| UEFA | The Union of European Football Associations |
| UK | United Kingdom |

# List of Publications

Sweeney, L., Horan, D., & MacNamara, Á. (2021). Premature Professionalisation or Early Engagement? Examining Practise in Football Player Pathways. *Frontiers in Sports and Active Living*, *3*, 660167. https://doi.org/10.3389/fspor.2021.660167

*Contribution:*

    a) Lead on writing of study with collaboration from all authors

Sweeney, L., MacNamara, Á., & Horan, D. (2022). The Irish Football Player Pathway: Examining Stakeholder Coherence Throughout and Across the Player Development System. *Frontiers in Sports and Active Living*, *4*, 834633. https://doi.org/10.3389/fspor.2022.834633

*Contribution:*

    a) Lead on study design, data collection and data analysis

    b) Lead on writing of study with collaboration from all authors

Sweeney, L., Cumming, S. P., MacNamara, Á., & Horan, D. (2022). A tale of two selection biases: The independent effects of relative age and biological maturity on player selection in the Football Association of Ireland's national talent pathway. *International Journal of Sports Science & Coaching*, 174795412211261. https://doi.org/10.1177/17479541221126152

*Contribution:*

    a) Lead on study design, data collection and data analysis

    b) Lead on writing of study with collaboration from all authors

Sweeney, L., Cumming, S., MacNamara, Á., & Horan, D. (2023). The selection advantages associated with advanced biological maturation vary according to playing position in national-level youth soccer. *Biology of Sport*. https://doi.org/10.5114/biolsport.2023.119983

*Contribution:*

    a) Lead on study design, data collection and data analysis

    b) Lead on writing of study with collaboration from all authors


Sweeney, L., Taylor, J., & MacNamara, Á. (2023). Push and Pull Factors: Contextualising Biological Maturation and Relative Age in Talent Development Systems. *Children*, *10*(1), 130. https://doi.org/10.3390/children10010130

*Contribution:*

    a) Lead on writing of study with collaboration from all authors

**Journal Articles Under Review**

Sweeney, L., MacNamara, Á., & Taylor, J. (Under Review). Riding the wave: A prospective exploration of the temporal impact of perceived challenges and psychological safety on national-level youth footballers' development. *Psychology of Sport and Exercise.*

*Contribution:*

a) Lead on study design, data collection and data analysis

b) Lead on writing of study with collaboration from all authors

# Oral Presentations

Sweeney, L.; Taylor, J.; Horan, D.; MacNamara, Á. The effects of relative age and biological maturity on player selection in the Football Association of Ireland National Talent Pathway. Football Association of Ireland National Coaching Conference (2022).

Sweeney, L.; MacNamara, Á. Maximising potential through the pathway: An interdisciplinary and mixed-method investigation of player development in Irish football: Research Update and Practical Recommendations. Football Association of Ireland High Performance coach presentation (2022)

Sweeney, L.; Cumming, S.P.; MacNamara, Á.; Horan, D.  A Tale of Two Selection Biases: The Independent Effects of Relative Age and Biological Maturity on Player Selection in the Football Association of Ireland's National Talent Pathway. Dublin City University Elite Sports Performance Student Conference (2022)

**Abstract**

**PhD Title:** Maximising potential through the pathway: An interdisciplinary and mixed-method investigation of player development in Irish male football.

**Author:** Liam Sweeney

Talent development (TD) is a complex, dynamic, and non-linear process mediated by a range of biopsychosocial variables. However, research in TD has been dominated by retrospective and uni-disciplinary designs and a lack of applied focus. Adopting a biopsychosocial, pragmatic, and interdisciplinary lens, this PhD addressed gaps within the literature by critically examining the Football Association of Ireland's (FAI) male TD system. Chapter three critically considered the research underpinning the early engagement practices of professional football clubs and the extent to which, and how, the pathway can provide the most appropriate starting point for player development. Evidence highlighted the need to consider the biopsychosocial nature of TD and socio-political environmental influences. Reflecting the environment, Chapter four examined the level of coherence across the FAI's TD system. Findings demonstrated a lack of coherence, characterised by conflicting interests, a lack of communication, and poor relationships between stakeholders. Chapter five investigated the extent to which biological maturation and relative age selection biases existed across the national talent pathway. Large selection bias in favour of early maturing players were found, increasing in magnitude with age, with relative age biases smaller in magnitude and stable with age. Chapter six demonstrated that the magnitude of these biases varied significantly by playing position. Chapter seven examined the nature of biological maturation and relative age and their associated challenge dynamics in TD. Findings suggest that these concepts must be considered individually alongside a broader field of biopsychosocial factors that impact challenge dynamics. Chapter eight investigated the temporal impact of perceived challenges and psychological safety in players in the FAI's national TD system. Significant biopsychosocial challenge was a key feature of each player's experience, although the dynamic of challenge effects were highly individual. Findings from this thesis reflect the complex nature of TD, with practical guidelines for practitioners provided throughout.

# Chapter 1: Introduction

The identification and development of talented young players is one primary objective of all professional soccer (herein referred to as football) academies and associations (Cumming, Searle, et al., 2018; Hill et al., 2021). For the purpose of developing footballers for developmental, financial, and competitive gain, professional football clubs recruit thousands of youth players each year into large and well-funded academies, with selection taking place from as young as seven years of age in some contexts (e.g., English Premier League Football Academies) (English Premier League, 2011; Read et al., 2016). Those academy players that are selected typically receive professional coaching, sports science and medical support, gain access to superior training equipment and facilities, and are exposed to high levels of competitive challenge (Hill et al., 2020; Johnson et al., 2017). The provision of these resources and support systems from an early age is proposed to help to ensure that these players experience optimal challenges and opportunities to facilitate development. The factors that influence Talent Development (TD) in football are, however, complex, dynamic, and multifaceted, with a range of biopsychosocial variables having the potential to impact a young player's progression (Abbott et al., 2005; Abbott & Collins, 2004; Collins et al., 2019; Collins & MacNamara, 2019; Webb et al., 2016).

## 1.1 The Biopsychosocial Perspective

The influence of biological (Epstein, 2014; Simonton, 2001), psychological (Collins et al., 2016; Savage et al., 2017, 2022), and social (Henriksen et al., 2010a, 2010b) variables, and their interactions (Bailey et al., 2010; Collins et al., 2019; Collins & MacNamara, 2019; Gagné, 2000, 2004) in the development of talent is well established. In this regard, athlete development is the result of, and is constrained by, the dynamic interaction of physical and mechanical

attributes, psycho-behavioural characteristics, and the sociocultural milieu in which the individual exists (Figure 1.1) (Bailey et al., 2010; Collins & MacNamara, 2019). Thus, investigations and interventions focusing on the complex nature of athlete development must be interdisciplinary (involving different areas of knowledge and study) and reflective of these biopsychosocial elements.

Biological factors constitute the physical or physiological elements that affect and influence development (Bailey et al., 2010). Whilst not an exhaustive list, anthropometric characteristics (Deprez et al., 2015; Gagné, 2000), genetic predispositions to athletic training (Epstein, 2014), aerobic and anaerobic performance characteristics (Faude et al., 2012), hormonal and metabolic adaptations to training (Bailey et al., 2010), and the rate at which one matures biologically (Ostojic et al., 2014) have all been shown to be key biological characteristics that influence development and/or contribute to successful sporting performance. Psychological factors include the individual cognitive, emotional, motivational, and behavioural factors that affect and influence the developmental process (Bailey et al., 2010). Whilst not exhaustive, psychological skills that have been shown to be key in shaping athlete development include one's ability to respond to developmental challenges and setbacks (Taylor & Collins, 2019), the ability to cope under pressure (Taylor & Collins, 2019), the ability to set realistic performance goals (MacNamara et al., 2010a, 2010b), and one's motivation to engage in requisite practice and training (Collins & MacNamara, 2022; Savage et al., 2017, 2022). Social factors constitute the social, cultural, institutional, and environmental factors that shape the norms, values and practices of organisations, groups or individuals within a given context (Bailey et al., 2010; Bjørndal et al., 2017). A number of key social factors have been shown to affect development in sport, including the influence of the athlete's family (Côté, 1999) and coaches (Cushion et al., 2012; Larsen et al., 2013; Smith & Cushion, 2006), as well as the philosophy of the athlete's specific sporting environment (Christensen, 2009;

Larsen et al., 2020), and the extent to which integration between the athletes' various developmental contexts exists (Bjørndal et al., 2017; Bjørndal & Ronglan, 2018; Curran et al., 2021, 2022; Henriksen et al., 2010a, 2010b). A range of broader biopsychosocial factors that are key components in shaping the TD process for athletes are described further in section 2.1 and 2.2 in Chapter 2 and can be visualised in Figure 2.1 in Chapter 2.

Although the importance of a biopsychosocial approach to development is stressed within the literature (Bailey et al., 2010), monodisciplinary (involving a single academic discipline) and unidimensional (adopting a measurement or evaluation that only considers one dimension of a concept) approaches to TD often prevail (Collins et al., 2019). For example, an emphasis on physical and physiological attributes (Baker et al., 2018; Bradley et al., 2019; Hill et al., 2020; Johnson et al., 2017), 'snapshot' talent identification protocols (Abbott et al., 2005; Johnston & Baker, 2020), a focus on short-term success (Curran et al., 2022; Pankhurst et al., 2013), early selection procedures (Güllich, 2014; Read et al., 2016), and a disregard for the broader social milieu (environment) in which athletes develop (Bjørndal et al., 2018; Curran et al., 2022; Ivarsson et al., 2015) continue to be common approaches to TD across sporting contexts. These approaches persist despite the significant evidence countering the efficacy of these approaches (Abbott et al., 2005; Abbott & Collins, 2004; Collins et al., 2019). Furthermore, the multiplicative processes identified by Gagné (2000, 2004), an approach which emphasises the interactive effects of the biopsychosocial elements, are also frequently ignored by both research and practice (cf. Collins et al., 2019). The biopsychosocial nature of TD means that for it to be understood holistically, it cannot be reduced to monodisciplinary approaches (cf. Bailey et al., 2010).

Whilst the different factors that impact upon athlete development (e.g., physiology, developmental psychology) can be profitably analysed as discrete elements that offer value, they cannot be used in isolation to underpin theory, policy or recommendations for good

practice (Bailey et al., 2010). Monodisciplinary approaches to talent identification and development miss the complex, dynamic and non-linear nature of development and are, therefore, inherently inadequate frameworks to support TD (Collins & MacNamara, 2022). Therefore, a biopsychosocial approach to research offers the most effective basis for investigating and manipulating the crucial, but complex, nature of TD (Bailey et al., 2010) and underpins the approaches utilised in the studies outlined within this thesis.
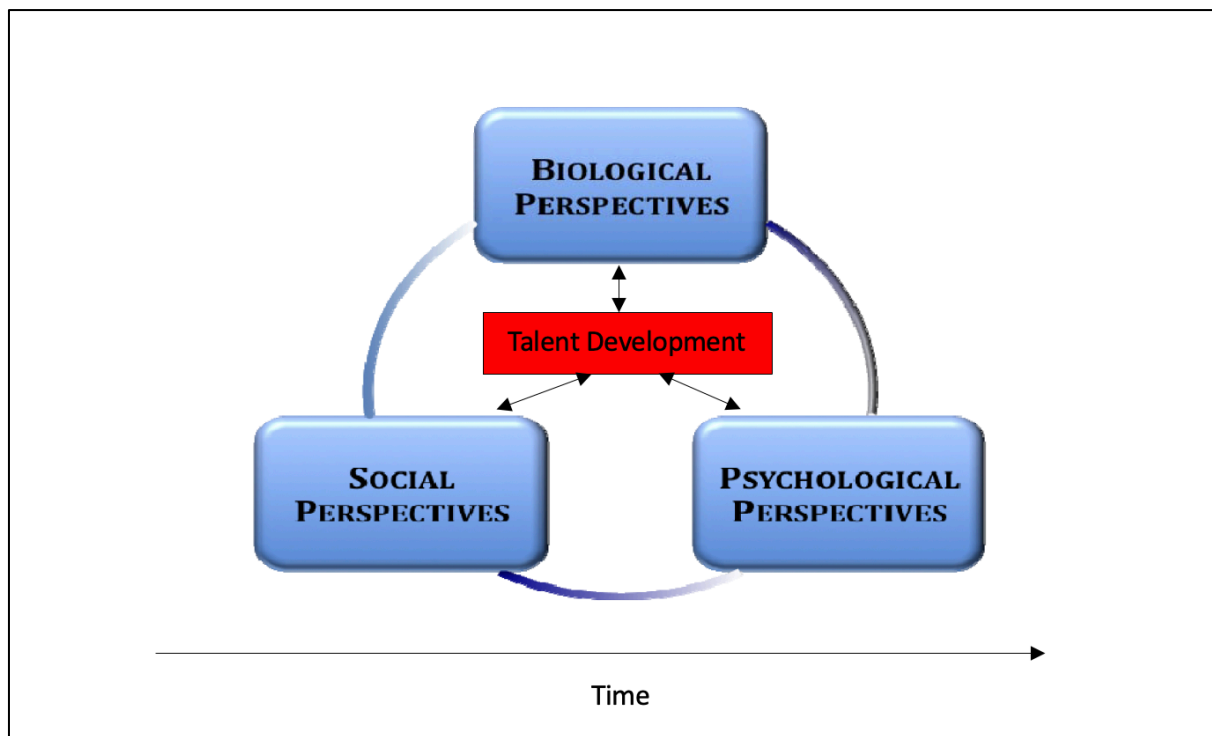


Figure 1.1 Elements of the Biopsychosocial Model of Development (adapted from Bailey et al., 2010).

## 1.2 The Football Association of Ireland (FAI)

The FAI is the National Governing Body (NGB) for football in Ireland. The association's structure is split into three sections: the General Assembly, the Board of Management, and the Committees. The General Assembly is made up of three chambers (The Professional Football Chamber, The Amateur and Youth Chamber, and The National Body Chamber), with each

chamber entitled to nominate one third of the delegates to the General Assembly (Football Association of Ireland Board and Assembly, 2023). The Board of Management comprises 10 members (including the President and Vice President), with further independent chairpersons appointed to two different committees; The Football Committees and the Business Committees (Football Association of Ireland Board and Assembly, 2023). Within the Football Committees, there are individual chairpersons responsible for international and high performance, underage structures, amateur and youth structures, and underage National Leagues (NL), respectively. The underage NL represent academy infrastructures in Ireland and will be outlined in the forthcoming paragraphs. A talent pathway can be defined as 'the programmes that are designed to select and support performers with potential to reach senior level' (Webb et al., 2016, p. 5). As of 2022, the FAI had 1,186 grassroots clubs and 221,500 registered players across the pathway (Football Association of Ireland Strategy, 2022-2025). Thus, the TD system in Irish football is multifaceted and multi-contextual, with multiple stakeholders impacting youth development structures.

### 1.2.1 The Schoolboy Football Association of Ireland (SFAI)

Youth development structures within Irish football begin with the Irish schoolboy leagues, which are governed by the SFAI. The SFAI is an affiliate of the FAI. The SFAI is the governing body for underage youth football up to the under 16 age group (Schoolboy Football Association of Ireland, 2023) and has full jurisdiction over all affiliated leagues and their respective clubs, players and coaches. The SFAI has 30 separate football leagues throughout Ireland, with each schoolboy football league also governed independently by their individual league council. This makes the dynamic of the Irish football landscape particularly complex and cumbersome, with each schoolboy football league operating independently from one another under the jurisdiction

of the SFAI, and the SFAI operating independently from the NGB, the FAI. SFAI structures will be explored in greater detail in Chapter 4.

**1.2.2 The Player Development Plan**

In 2015, the FAI introduced the Player Development Plan as a result of a significant shift in how the TD system for young players in Ireland was structured, and included modifications to coaching structures, playing formats, and underage competitions, with a shift in focus towards long-term player development. Between 2015-2019, a primary component of the plan, the under 17, 15, and 13 (changed to under 14 in 2020) NL, respectively, were introduced to enhance the development of players in Ireland. The introduction of the underage NL required senior (professional) League of Ireland clubs to create affiliated academy squads from the under 13 to under 19 age cohorts, like the academy system seen in professional clubs elsewhere throughout Europe. Before the introduction of the underage NL, no academy system in Ireland existed, and as aforementioned, schoolboy football clubs were responsible for the development of young Irish players. Prior to the introduction of the NL, large schoolboy clubs in the Dublin District Schoolboy League (DDSL: the largest of the 30 schoolboy football leagues in Ireland) dominated schoolboy competitions and, due to the number of players from this select number of schoolboy clubs signing for professional clubs in the United Kingdom (UK), were considered by many to be the best clubs for high potential players from across Ireland to play for. This led to players from different parts of Ireland travelling large distances to play in the DDSL. The NL were introduced by the FAI to provide a consistently higher quality of youth coaching and competition nationwide so that high potential players in every county in Ireland had the opportunity to avail of coaching and playing environments that were perceived by the FAI to be better suited to their needs. As a result, each year, around 400 players at the under 14 age group who are perceived to be of the highest potential at the time of selection transition

from schoolboy football to the underage NL, leaving a remaining 13,500 players in schoolboy football structures each year at this age group (Football Association of Ireland, 2023). This decision was a radical intervention in player development in Ireland and caused significant debate among the SFAI and many of its member clubs, who perceived that their control over player development in Ireland had been unrightfully removed.

Separate to the underage NL, the FAI have also created the Emerging Talent Programme to assist in the development of players nationwide. The Emerging Talent Programme provides a structured programme of development at league (30 schoolboy leagues), regional (10 regions) and national (National Academy) level. Although the Emerging Talent Programme selects players from schoolboy football clubs, these programmes are under direct control of the FAI, not the SFAI. The Emerging Talent Programme is explained and explored in further detail in Chapters 4, 5, 6 and 8. The FAI's player pathway, from the Emerging Talent Programme through to the underage and senior NL (League of Ireland) is depicted in Figure 1.2. These pathway structures are described in further detail in section 4.2.1 in Chapter 4.
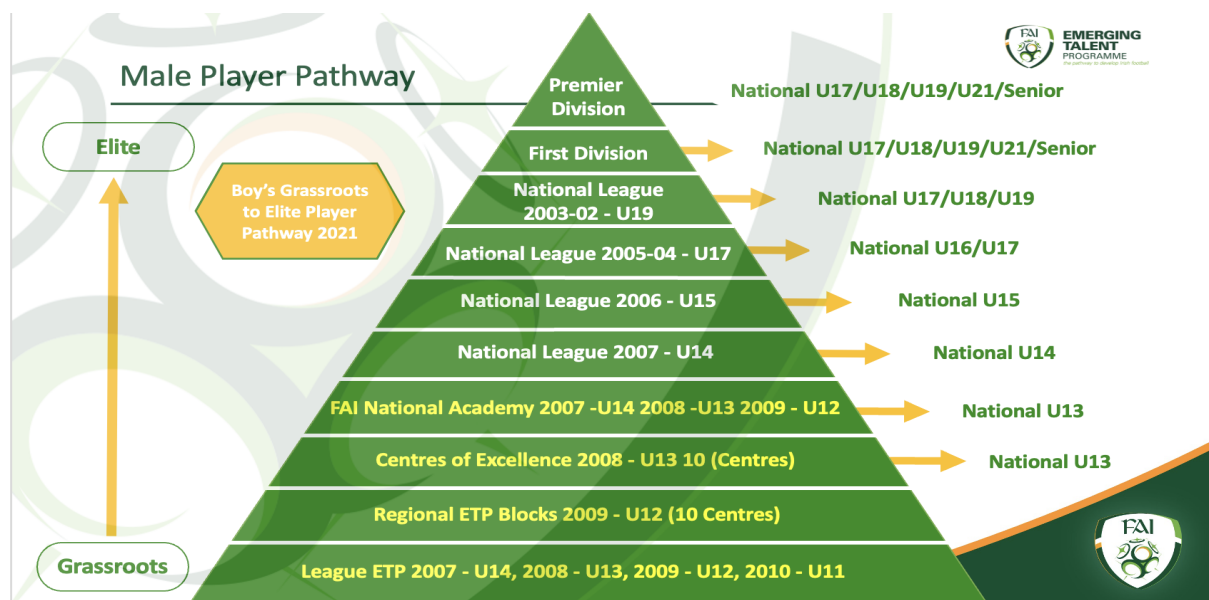


Figure 1.2. The FAI Male Player Pathway (2021/2022).

### 1.2.3 The Impact of Brexit on the FAI Player Pathway

In the decade preceding Brexit (2011-2020), out of all the 200 Federation Internationale de Football Association (or International Federation of Association Football in English; FIFA) member associations, Ireland had the most players aged under 18 transferred to professional clubs abroad, most consistently to UK-based clubs (FIFA, 2021). It was in these UK-based academies where the highest potential Irish players continued their development after leaving Ireland. However, once the UK formally left the EU during Brexit, the exemption that allows European clubs to sign European players aged under 18 no longer applied to UK-based clubs, making Irish clubs primarily responsible for developing players up to 18 years of age. At the outset of this PhD, Ireland's senior international men's team was ranked 51$^{st}$ out of 210 nations, compared to a ranking of 28$^{th}$ only 10 years prior (FIFA: Republic of Ireland, 2021). From the start of the 2021/22 season, there were 22 Irish players registered with an English Premier League first team (The Irish Times, 2021) with no capped Irish players registered with a first team in any other top-five ranked European domestic football league (La Liga, Serie A, Ligue 1, Bundesliga (the Union of European Football Associations (UEFA) (2021)). The Irish men's senior national team has failed to qualify for a FIFA World Cup finals since 2002, and a UEFA European Championship finals since 2016. Following Brexit, Irish football was now presented with one of its biggest challenges: to consistently develop senior players capable of competing against its international counterparts.

## 1.3 Examining the FAI's Talent Development Environment (TDE)

Although there is some evidence underpinning the rationale for the changes in player development policies implemented by the FAI (e.g., increased contact hours, access to qualified coaches, increased levels of competitive challenge  (Collins & MacNamara, 2012;

Ford et al., 2009; Ford & Williams, 2012; Haugaasen et al., 2014; Roca et al., 2012; Sieghartsleitner et al., 2018; Zibung & Conzelmann, 2013)), to date, there is no empirical data to evidence both the short and long-term impact of these modifications on player development in Ireland and the perceptions and understanding of key stakeholders about the experience. Whilst similarities in TDEs can exist at their core, TDEs are highly individualised and culturally specific (Henriksen et al., 2010a, 2010b). Examining the talent pathway within Irish football is especially important given the overarching and systematic influence culture has on the development of talent (Martindale et al., 2007).

Reflecting these points, it is essential to consider the complexity of the environment in which young Irish players develop and the multiple stakeholders that they interact with (cf. Bjørndal et al., 2018; Bjørndal & Ronglan, 2019; Henriksen et al., 2010a, 2010b). Much of the research on TDEs to date has focussed on single or linear pathways (e.g., single club or academy) (cf. Curran et al., 2022), but it is important to understand how the FAI, as the NGB for football in Ireland, systematically supports the development of young Irish players in a coherent manner (Martindale et al., 2005, 2007). Whilst investigations into the development environments of a single club or context (e.g., Henriksen et al., 2010a, 2010b) can be insightful and informative, they do not accurately reflect a TDE of a national Football Association and the multiple (and complex) teams, clubs, affiliates, and stakeholders within it (section 1.2).

As such, this PhD research programme examined how the design of the FAI's TD system impacts across multiple stakeholders, including coaches, parents, and management, as well as the young Irish players themselves. These evidence-informed outcomes are required to support the FAI in the refinement of the TD pathway for Irish football, ensuring that it provides optimal opportunities and experiences to develop high performing players across Ireland.

## 1.4 Methodological Progressions for Talent Development Research

As outlined in the preceding sections, TD is a dynamic, non-linear, and multidimensional process (Abbott et al., 2005; Abbott & Collins, 2004), with a range of biopsychosocial variables impacting a young player's progression (Bailey et al., 2010; Collins et al., 2019; Collins & MacNamara, 2019). Thus, TD systems must be cognisant of these factors (Collins & MacNamara, 2022) and holistic in nature (Webb et al., 2016), providing athletes with a coherent pathway experience (Martindale et al., 2005, 2007). Holistic TD acknowledges that the developmental process for an individual in sport is influenced by a complex and dynamic interaction of biopsychosocial factors, rather than simply based on a single aspect or component (Bailey et al., 2010). However, evidence in football academies indicates that the identification and selection of many young players may often be based upon a linear, static and uni-dimensional conceptualisation of talent (e.g., Bergkamp et al., 2019), which, in turn, can lead to deselection of many children (Abbott & Collins, 2002). For example, evidence exists to demonstrate the preferential selection of those who are advanced in biological maturation (e.g., Hill et al., 2020; Johnson et al., 2017) or those who are relatively older (e.g., Lovell et al., 2015) at the point of selection. These factors will be discussed in further detail in Chapter 2 and investigated in an Irish context in Chapters 5-7. In essence, those who perform well at the point of identification are often selected based upon the factors thought to underpin senior performance (Collins et al., 2019) without due consideration to the dynamic nature of the pathway and the non-stable nature of these factors (Abbott & Collins, 2004). It is also important to note that talent identification and selection is a complex and multifaceted process, influenced by a host of socio-political and systemic factors (e.g., resource allocation, outcome measures of the pathway). These outcomes will be analysed in further detail in Chapter 3.

Substantial evidence exists to demonstrate the lack of relationship between success at the youth level and successful performance at the senior level in football (Güllich, 2014;

Herrebrøden & Bjørndal, 2022; Schroepf & Lames, 2018). Despite a number of authors emphasising the non-linear nature of development and the importance of the biopsychosocial elements (e.g., Abbott et al., 2005; Abbott & Collins, 2004; Bailey et al., 2010; Collins et al., 2019; Collins & MacNamara, 2019), considerable research within TD, and within football specifically, still tends to look at the developmental process through a uni-disciplinary lens, identifying single variables related to development (e.g., physical attributes (le Gall et al., 2010), accumulated practice and training volumes (Güllich, 2019; Güllich et al., 2017), month of birth (Andrew et al., 2022)), without considering the effect that may have on, or be affected by, other influences on the development process (cf. Curran, 2023). A focus on isolated performance indicators as predictors of senior performance is a typical limitation of TD research within youth football specifically (cf. Bergkamp et al., 2019). In this regard, it is also important to recognise the inconsistency and the large variations in the way in which 'elite' athletes are defined across TD research (Swann et al., 2015).

Notwithstanding the uni-disciplinary focus, research in TD has been dominated by retrospective designs and a lack of applied focus (Collins et al., 2019). In order to advance the state of play in research and practice, Collins et al. (2019) have called for the need for translational and pragmatic research with an interdisciplinary approach to offer a rich but practically meaningful and context-specific picture of athlete development. Moreover, several scholars have suggested that to fully understand development within a specific sporting context, such as the TDE of a Football Association, a mixed-methods and multi-layered analysis of macro, meso, and micro stages of the pathway is required (Collins & MacNamara, 2019; Curran et al., 2022; Henriksen et al., 2010a, 2010b).

Building upon these points, the aim of this thesis was to employ a biopsychosocial lens to explore the mechanisms and principles underpinning TD in the FAI's male player pathway

using a series of prospective, longitudinal, multi-method, and contextually situated studies that examine young Irish players' experiences, skills, supports and challenges.

## 1.5 My Context and Positioning

Throughout this PhD, I was embedded within the FAI, working closely with various coaches, head of academies, players, directors, and management staff. As part of this role, I would visit various grassroots (schoolboy) clubs and academies nationwide, delivering workshops and presentations around my PhD research to upskill and educate coaches and practitioners based upon the emerging evidence from my PhD. In addition, I would regularly deliver on coach education/training events and national coaching conferences, which included presentations to coaches on their UEFA A and UEFA Pro licence. As part of this embedded role, I would attend underage international and national training camps, and high-performance coach meetings, working closely with staff and providing support in areas related to my PhD. As such, I gained valuable insights into the practical realities of coaches and practitioners within the FAI and the issues that they were facing. Significantly, these insights provided me with an understanding of the pathway experiences of young Irish players. As a result of this role, I had direct experiences in, and knowledge of, the issues that I was investigating, which subsequently supported the design of the studies undertaken, the research questions asked, the methods subsequently employed to answer them, and my interpretations of the findings.

I was interested in exploring TD in football in Ireland, to provide evidence informed knowledge to refine, and ultimately, improve player development processes within the FAI. Of significant relevance to this thesis, however, I found it concerning that such drastic changes had been made to the FAI's TD system, with no tangible evidence to underpin the rationale for these changes, and no subsequent data to evidence either the short or long-term impact of these changes since implementation. I was particularly motivated to be the first researcher to

holistically explore the TD system of the FAI and to have the opportunity to produce impactful and meaningful research that could be used to make informed decisions that led to systemic change. I am proud of the research outputs from my PhD, and I believe them to be a significant contribution to both research and practice.

## 1.6 Philosophical Positioning

In considering the methodology and findings of the thesis, it is important to acknowledge my personal philosophical positioning. One's philosophical position is a system of generalised views of the world which form beliefs that guide one's actions (Moon & Blackman, 2014). Therefore, how a researcher may choose their methodology demonstrates a commitment to a version of the world and how the researcher can come to know about that world. Ontology refers to questions about the nature of reality within the human world that a researcher can acquire knowledge about (Creswell, 1994; Moon & Blackman, 2014). Epistemology refers to the acquisition of knowledge (i.e., the theories of knowledge), the source of legitimate knowledge, and one's possession of that knowledge (Childers & Hentzi, 1995; Moon & Blackman, 2014).

Pragmatism is a philosophy of knowledge construction that emphasises practical solutions to applied research questions and the consequences of inquiry. James (1907) described how pragmatism was not a philosophical position for 'solving names' or answering questions about an absolute truth, but rather, presented an approach which sought to provide practical solutions to problems experienced by people and society. In this regard, the practical and respective consequences of inquiry are proposed to be amongst the primary concerns for the pragmatic researcher (James, 1907). In line with this, Dewey (1931, 1938) proposed that inquiry is an investigation to understand some unknown part of reality and to create knowledge to understand that gap in understanding; a creation of knowledge to generate a practical change

or improvement in that context. Indeed, Dewey (1938) stated that 'any problem of scientific inquiry that does not grow out of actual social conditions is factitious' (p. 499). Thus, pragmatic inquiry is concerned with understanding the relationship between our actions and their consequences, helping one to gain more control over their actions (Dewey, 1931, 1938). In this regard, Peirce suggested that the consequences and outcomes of inquiry should be viewed as guiding principles (Peirce, 1905) and that the meaning of a concept is the matter of practical effects of acting in accordance with it (Houser & Kloesel, 1992; Peirce, 1903). However, Peirce 'would want an argument about why that is the whole of our interest in the concept of the truth predicate. He would take another step and argue that when we assert that p (and hence, assert that p is true), part of what we are doing is asserting that it stands up to reasons now and betting that it would continue to do so, although we of course might be mistaken about that' (Misak, 2016, p. 30).

In later forms of pragmatism, often labelled 'Neo-Pragmatism', Rorty (1990) argued that knowledge cannot be an accurate representation of the truth and that there is no single reality. Instead, different types of knowledge are viewed as tools or information to help us within our given context (Rorty, 1990). From this perspective, value is placed upon the method and theory that is most useful to us in our given context, and not those that reveal underlying truths about the nature of reality. This thesis will draw more from the pragmatic tradition of early pragmatists, rather than the Neo-Pragmatists, drawing on the notion of the importance of taking seriously 'what is tangible and practical' (Bacon, 2012, p. 2).

Pragmatist philosophy holds that human actions can never be separated from past experiences and from the beliefs that have originated from those experiences. Therefore, researchers take action based upon the possible consequences of their action, and they use the results of their actions to predict the consequences of similar actions in the future (Kaushik & Walsh, 2019). In this regard, pragmatist epistemology does not view knowledge as reality, but

something that is constructed with a purpose to better manage one's existence (Rorty, 1980). The pragmatist maintains, therefore, that humans are themselves capable of shaping their experience through their social actions and intelligence, and worldviews can be both individually unique and socially shared (Kaushik & Walsh, 2019). Rorty (1982) suggested that all inquiry begins with and is guided by previous discourse that researchers inherit from predecessors.

James (1907) argued that truth is of coherence with the ideal limit of scientific inquiry. However, pragmatism does not maintain that all knowledge is truth; instead, knowledge is fallible (James, 1907). Truth cannot be determined once and for all; by acting on our beliefs and observing the consequences we can know whether our theory worked, but this is a pragmatic test that could yield contrary results in other contexts (Cherryholmes, 1992). As such, scientific research can inform action, but these outcomes are not incontestable (Cherryholmes, 1992). Pragmatic researchers recognise that anything in principle could be overturned; one's hypothesis might turn out to get contrary evidence, thus, there can never be certainty because it is always possible that science will develop (Kaushik & Walsh, 2019). In this respect, science is a process of rational belief revision, but upon encountering new information, a pragmatist's beliefs may change (Cherryholmes, 1992). Dewey (1969) suggested that the conclusions of prior knowledge are instruments of new inquiries, not the norms which determine their validity. Building on this, Bacon (2012) described how 'pragmatists remind us of the way in which our practices contain error and injustices, and draw upon those practices in order to offer re-descriptions with a view to making our lives and our world richer and freer' (p. 201).

Ontologically and epistemologically, therefore, pragmatism is not committed to any single system of philosophy or reality (Weaver, 2018). Reality is actively generated as individuals experience the world (James, 1907; Kaushik & Walsh, 2019) and is, therefore, ever

changing based upon human experience and orientated towards solving practical problems (Weaver, 2018). Truth is what works at the time of inquiry and is not based on dualism between reality independent of the mind and within the mind (Weaver, 2018). Positivists adopt objective epistemological and ontological views that assume the existence of a real or true reality that can be measured and understood with the application of scientific methods, devoid of any human interference or subjective bias (Moon & Blackman, 2014). This objective reality is proposed to be generalisable across time and contexts, with findings being absolute, irrespective of the socio-cultural or historical context in which they were concluded (Lincoln & Guba, 2000). In contrast, constructivists embrace a subjective view of knowledge that is individualised and context-dependent, with subjective views about reality constructed through interactions within the socio-cultural climate of the individual context (Lincoln & Guba, 2000). Thus, positivists generally believe that only tightly controlled, directly observable empirical data provide legitimate knowledge and typically opt for experimental designs within contrived settings using quantitative representations of data (Giacobbi et al., 2005). In contrast, constructivists disavow objective claims about reality and embrace time and context dependent explanations about knowledge that are influenced by the individual context (Giacobbi et al., 2005).

Whilst positivism and constructivism are two dichotomous epistemological views, pragmatism rejects the idea that knowledge is objective and universal or that knowledge is entirely subjective, and argues that a continuum exists between objective and subjective realities (Figure 1.3), with the viewpoint adopted dependent upon the contextual nature of inquiry and the specific research question (Giacobbi et al., 2005). In adopting this stance, the pragmatic researcher is able to select the research design and methodology that are most appropriate to address their research question (Kaushik & Walsh, 2019). In essence, pragmatists believe that the problems under study and the specific research questions employed

to answer them are more important than the underlying philosophical assumptions of the method (cf. Giacobbi et al., 2005). When seeking knowledge, the accuracy of this knowledge is not the only concern for the pragmatist, instead, the impact of this knowledge is the central concern, with consideration to what the knowledge will do and who it will help (Bacon, 2012). In essence, pragmatists consider the practical concerns with human existence, the research questions being asked, and the consequences of inquiry to be more important than whether objective or subjective truths are more appropriate (James, 1907; Giacobbi et al., 2005), with the ultimate aim being to produce plausible information adequate to the needs of practice (Rescher, 2014; Talisse & Aikin, 2008). Therefore, research findings are evaluated based upon their practical consequences in the specific context under investigation (James, 1907; Talisse & Aikin, 2008). However, true ideas to the pragmatic researcher are those that we can assimilate, validate, corroborate, and verify, and false ideas are those that we cannot (James, 1907). 'Meaning' is tied to experiment (Bacon, 2012). Thus, knowledge is understood to be useful so long as it is practical within the context of inquiry *and* scientifically grounded.
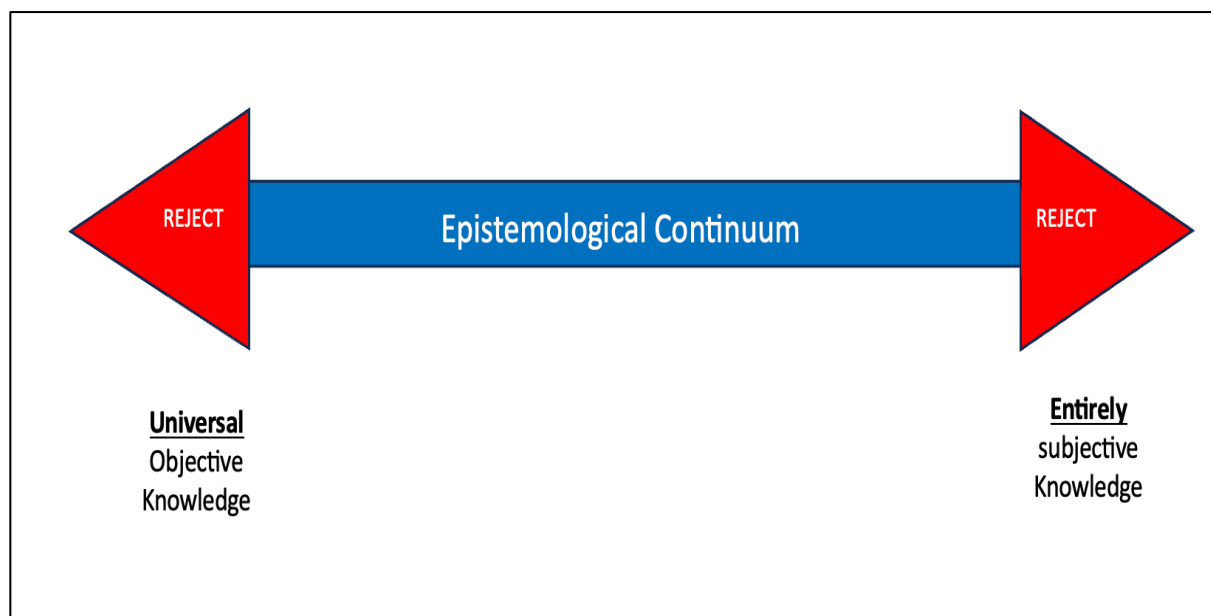


Figure 1.3 The Epistemological Continuum of the Pragmatic Research Philosophy.

As a researcher aiming to generate practically meaningful information for the TD processes in Irish football, the research conducted throughout this PhD was underpinned by a pragmatic research philosophy (Giacobbi et al., 2005). A pragmatic approach to research allowed for the generation of knowledge that is practically useful for the young players within Irish football, as well as the individual practitioners and stakeholders that support them (Badley, 2003). Because of the epistemological continuum as noted above (Figure 1.3), my pragmatic approach to this PhD required the utilisation of both qualitative and quantitative investigations, prospective and longitudinal designs, and the study of multiple stakeholders, with the methods deployed deemed the most appropriate for the specific context under investigation and the specific research questions for each respective study. In this regard, and reflective of the epistemological continuum in Figure 1.3, I identified a series of meaningful research questions that needed to be asked to make a practical difference in the Irish football context, with the methodological approach selected for each research study deemed most appropriate to answer that specific research question.

The research study outlined in Chapter four sought to examine the extent of stakeholder coherence across the Irish football system, with a focus on identifying perceptions, experiences, and beliefs across the sample. As such, this required a qualitative and interpretative methodological approach, analysed using Reflexive Thematic Analysis (RTA) to identify patterns of meaning across the dataset.

The research study outlined in Chapter 5 sought to examine the extent to which biological maturity and relative age selection biases existed in national-level players in the FAI's national TD system. As such, this required a more positivistic approach, with a focus on examining the proportional distribution of players according to biological maturity status and relative age, with data analysed using a series of quantitative statistical approaches. Similarly, building upon the findings of Chapter 5, Chapter 6 sought to identify the extent to which these

biological maturity selection biases varied according to playing position, which required the use of quantitative statistical analysis to examine between-group differences.

The research study outlined in Chapter 8 sought to explore the temporal impact of perceived challenges and psychological safety in the development of national-level players over the course of their first season in the FAI's national TD system. As the research focus was placed upon examining temporal experiences, this required a methodological approach that leant more toward the constructivist research tradition, with an analytical focus on subjective meaning and experiences. In sum, this PhD sought to generate meaningful knowledge to inform best practice for player development in Irish football through a mixed-methods approach.

This research approach was supported and guided by my experiences in, and understanding of, the Irish football landscape, the player pathway, and my familiarity with the topics being researched, as outlined in section 1.5. Thus, my positioning as a practitioner familiar with the sport and context under investigation facilitated novel and innovative insights and formed the platform for a detailed inquiry (Bryant, 2009). The subsequent research outputs can be used to assist the FAI in the refinement of their TD processes in an evidence-informed, coherent, and holistic manner, to ultimately ensure that high potential players across Ireland are provided with the appropriate experiences and opportunities to fulfil their potential.

## 1.7 Aims and Objectives of the Thesis

The overarching aim of this thesis was to employ a biopsychosocial lens to explore the mechanisms and principles underpinning TD in the FAI's male player pathway. The aims and objectives of each chapter are summarised as follows:

**Research Aim:**

Critically evaluate the literature underpinning the early engagement practices of professional football clubs and the extent to which, and how, the pathway can provide the most appropriate starting point for player development **(Chapter 3).**

**Objectives:**

a) Synthesise the literature pertaining to early specialisation and diversification within a youth football context.

b) Evaluate the appropriateness of the early engagement practices of professional football clubs.

**Research Aim:**

Examine the extent to which horizontal and vertical stakeholder coherence exists across the FAI's player pathway and examine key stakeholders' perceptions of and alignment to academic TD principles **(Chapter 4).**

**Objectives:**

a) Conduct a series of semi-structured interviews with key stakeholders throughout and across the FAI player pathway.

b) Analyse qualitative data to identify the extent to which the player pathway is vertically and horizontally coherent.

c) Analyse qualitative data to understand key stakeholders' perceptions and understanding of key TD principles identified by the extant literature.

d) Identify and understand the areas of the player pathway that require attention/intervention by the FAI.

**Research Aim:**

Examine the associations between biological maturation status and relative age and the extent to which their relative selection biases exist across competitive age groups in an analysis of players within the FAI's national TD system **(Chapter 5).**

**Objectives:**

a) Analyse quantitative data to establish the extent to which biological maturation status and relative age respectively and independently influence the selection of Irish players (U13-16) into the national TD system.

b) Analyse quantitative data to identify the associations between biological maturation status and relative age.

c) Identify and understand how these factors influence talent identification and selection within Irish football.

**Research Aim:**

Examine the extent to which the selection biases associated with biological maturation status vary according to playing position in an analysis of players within the FAI's national TD system **(Chapter 6).**

**Objectives:**

a) Use quantitative data to identify in which positions the physical, physiological, and functional advantages associated with advanced biological maturation are most influential in the talent selection processes of national-level Irish U13-16 players.

b) Use the quantitative data to better inform practitioners of the variable and contextual influence of biological maturation status on talent identification and selection.

**Research Aim:**

Critically review the interventions presented by the extant literature to influence the challenge dynamics associated with biological maturation and relative age **(Chapter 7).**

**Objectives:**

a) Summarise the various strategies that have been suggested by the extant literature to counter the effects of biological maturation and relative age in TD systems.

b) Summarise the role and influence of challenge dynamics in the development of talent.

c) Provide practical recommendations for TD systems in the management of relative age and biological maturation, and the broader challenge dynamics inherent in development.

**Research Aim:**

Explore the temporal impact of perceived challenges and psychological safety on the development of youth football players upon their entrance into, and first season in, the FAI's national TD system **(Chapter 8).**

**Objectives:**

a) Analyse qualitative data through monthly semi-structured interviews to identify the temporal impact of perceived challenge and psychological safety.

b) Identify areas of the pathway that require refinement and intervention.

## 1.8 Programme of Work

Chapter 2 critically reviews the literature in the areas of talent conceptualisation, identification and development, and the principles of effective TDEs. This chapter also provides an overview of the talent pathway, including early sports engagement practices and the role of challenge experience in the development of sporting talent. This literature review summarises, synthesises, and discusses the literature, providing a comprehensive overview of the research landscape to date.

The first area of study presented in Chapter 3 sought to extend the knowledge base around talent pathways in football by critically evaluating the literature underpinning the early engagement practices of professional football clubs and the extent to which, and how, the pathway can provide the most appropriate starting point for player development. This involved desktop research into the landscape of the available literature within this context, which was subsequently published as a critical review. Reflecting the pragmatic research philosophy outlined in section 1.6 of this thesis, the remaining studies within each chapter sought to provide practically meaningful and evidence-informed knowledge that could be applied to support the refinement and improvement of TD processes within the FAI.

Upon review, findings from Chapter 3 highlighted the need for coherence throughout the TD system in order to optimise the developmental experiences of young players across the pathway. Building upon these recommendations, the study outlined in Chapter 4 presents a published examination into the levels of horizontal and vertical stakeholder coherence throughout the FAI's player pathway. This investigation utilised a series of semi-structured, one-to-one interviews with parents, coaches, and management from the grassroots to national level, analysed using RTA. Results from this investigation highlighted the lack of coherence across the pathway, characterised by a lack of communication and coordination between

stakeholders, as well as differing, and often conflicting, perceptions of the pathway and its long-term aims. This study was novel in that it allowed me to gain an understanding of the pathway from a broad range of stakeholder perspectives, and ultimately, allowed me to identify key areas that needed intervention and refinement, most notably related to systemic coherence.

Stakeholders interviewed in Chapter 4 expressed concerns over the extent to which they believed biological maturation was influencing selection dynamics throughout Irish youth football. As such, building upon the platform set by Chapters 3 and 4, Chapter 5 sought to examine the extent to which biological maturation and relative age influenced selection dynamics in the FAI's national TD system. Additionally, this chapter investigated the associations between both factors (i.e., to what extent these factors are related and/or how these factors vary in magnitude). This investigation utilised a series of quantitative t-tests and correlations, with findings revealing significant selection biases in favour of those advanced in biological maturation; a bias that increased in magnitude with chronological age. Relative age biases were also present, but much smaller in magnitude and remaining relatively stable with chronological age. The study presented in Chapter 6 builds on the findings outlined in Chapter 5 by quantitatively examining how these biological maturation selection biases varied according to playing position. Maturation biases were found to exist in most playing positions, but not all, and the magnitude of this bias was highly position dependent. Biological maturation selection biases were found to be most prominent in the positions most frequently involved in goal scoring situations (i.e., central attacking and defending positions). Both Chapters 5 and 6 present a first in the published literature, by highlighting the independent roles of biological maturity and relative age in the selection of national-level youth footballers.

Given the impact of relative age and biological maturation on the selection of young Irish players identified in Chapters 4-6, Chapter 7 builds on these findings and presents the first published critical review of the literature that proposes to negate the various selection and

challenge dynamics associated with biological maturation and relative age. Following this review, practical recommendations were provided for TD systems in the management of these factors and the associated challenge dynamics in TD. Within these practical recommendations, TD systems were encouraged to adopt a more holistic approach by conceptualising biological maturation and relative age within a broader spectrum of challenge dynamics and considering how other, less-measurable factors also impact player development.

Reflecting these points, the study outlined in Chapter 8 provided a first in the literature by prospectively exploring the temporal impact of perceived challenges and psychological safety on the development of youth football players over the course of their first season in the FAI's national TD system. Building on the findings outlined in Chapter 7, exposure to significant biopsychosocial challenge during the season was a key feature of each player's experience, although the dynamic of challenge effects were highly individual, with the evoked emotional disturbance, the psycho-behavioural skillset deployed, and the temporal nature of the challenge a highly individualised matter. The engagement of players across multiple community environments was, however, complicated by the lack of coherence across the pathway and the lack of a central controller, as suggested in Chapter 4. A lack of psychological safety was an omnipresent feature of each player's experience, predominately driven by the regular selection and deselection processes inherent to the national system. Adding to the data presented in Chapters 3 and 4, findings highlighted the lack of coherence across the FAI's player pathway and the need for well-developed coordination mechanisms and communication between pathway stages.

Chapter 9 summarises the findings of this thesis. This Chapter discusses the contributions of this thesis to the literature, followed by the provision of practical recommendations for the FAI resulting from the knowledge developed from each respective

chapter, as well as recommendations for future research within this domain. This chapter concludes with the strengths and limitations of this thesis.

## 1.9 Delimitations

Given that the focus of this research was to produce practically meaningful knowledge to enhance the TD processes within Irish football, Chapters 4, 5, 6 and 8 incorporate research studies that focussed solely on the Irish football player pathway, gathering data and insight into the young players involved and their sociocultural milieu. Whilst these research outputs produced evidence-informed knowledge that can be applied to TD systems, they may be delimited to the Irish football context and may not apply to non-Irish contexts or alternative sporting pathways. An additional limitation of this PhD research was that it focused on the Irish player pathway for male players only and, therefore, lacks gender diversity (cf. Curran et al., 2019). Transferability is the appropriateness and applicability of research conducted elsewhere applied to another setting (i.e., whether the original implications could be applied in the new setting and whether they would be as effective in the new setting as they were in the original setting) (Burchett et al., 2013). It is up to the reader to consider the transferability of these findings to their specific sporting and cultural context. Indeed, the findings and their respective implications may apply outside of the Irish football context to the wider benefit of other NGBs, clubs, coaches, parents, practitioners, and athletes.

However, given the recent strategic restructures in Irish football's underage development processes (as outlined in section 1.2.2), it was crucial from both an organisational and practical perspective to explore the TD system of the FAI. This was the first research of its kind to adopt a biopsychosocial lens to comprehensively analyse the FAI's TD system and its impact across multiple stakeholders. Given the pragmatic approach employed and the applied

nature of the research conducted, these research outputs can be utilised to guide decisions on

future player and coach development policies within Irish football.

# Chapter 2: Literature Review

## 2.1 Conceptualising Talent

Talent is a complex concept and to date, the research literature has lacked a clear theoretical framework (Baker, 2022). Generally, talent in sport is associated with a young athlete's potential for success at a future level of competition (Baker et al., 2019). However, a shared definition of talent is lacking, and historically, research has found itself in an unnecessary dichotomous nature vs nurture debate (Baker & Wattie, 2018; Davids & Baker, 2007). The poles of this debate being the extent to which exceptional performance is the result of biological or genetically constrained factors (i.e., nature) or the result of experience and learning (i.e., nurture) (Baker, 2022; Baker & Wattie, 2018; Davids & Baker, 2007).

In the Differentiated Model of Giftedness and Talent (DMGT) (Figure 2.1), Gagné (2000) suggested that talent was something that was *developed from* natural abilities, defining it as 'the superior mastery of systematically developed abilities (or skills) and knowledge in at least one field of human activity to a degree that places a person at least among the top 10% of age peers who are (or have been) active in that field' (p. 67). Others have stated that 'becoming exceptionally competent in certain fields depends on the presence or absence of inborn attributes variously labelled "talent" or "gifts", or less often, "natural aptitudes"' (Howe et al., 1998, p. 399). Reflecting inconsistencies in terminology (cf. Dohme et al., 2017), other authors have defined talent as 'the quality (or qualities) identified at an earlier time that promotes (or predicts) exceptionality at a future time' (Cobley et al., 2012, p. 3), 'a special ability that allows someone to reach excellence in some activity in a given domain' (Issurin, 2017, p. 1994), 'any innate capacity that enables an individual to display exceptionally high performance in a domain that requires special skills and training' (Simonton, 1999, p. 436), or 'an enhanced and functional relationship developed between a performer and a specific performance

28

environment' (Davids et al., 2017, p. 193). As evidenced in these examples, there are considerable variations in the definitions of talent, ranging from a focus on innate abilities to the outcomes of environment couplings or training and experience (cf. Johnston et al., 2018). Resultantly, across research and practice, there has been a high degree of variability in the factors found to discriminate between talented and less talented individuals (Johnston et al., 2018), as well as a high degree of variability in the techniques, purpose, protocols, and processes used to identify and select young athletes across contexts (Johnston & Baker, 2020).

Howe et al. (1998) devised a criterion to explore the validity of innate talent. The authors suggested that a) talent is, at least partly, genetically transmitted, b) talent will have some advanced indications and those with training can predict those with a greater likelihood of success, c) these early indicators of talent provide a basis for predicting who is likely to excel, d) only a minority are talented, and e) talent is relatively domain specific. In a re-evaluation of these criteria, Baker & Wattie (2018) determined that while these criteria may be reasonable from a conceptual perspective (excluding the fifth criteria: that talent is relatively domain specific), they have limited utility because of a lack of valid and reliable measures for practitioners and researchers. Indeed, innate talent alone is not sufficient to explain exceptional human performance (Collins & MacNamara, 2022; Gagné, 2000).

Simonton's (1999) Emergenic and Epigenetic Model of Talent and its Development suggests that talented performance results from the interaction of genetic factors and a conducive practice environment, rather than simply on the basis of either nature-related or nurture-related factors. Gagné's (2000) DMGT proposes a clear distinction between giftedness and talent. 'Giftedness' is the possession and use of untrained and spontaneously expressed natural abilities (called aptitudes or gifts) in at least one ability that places an individual among the top 10% of age peers. Contrastingly, 'talent' is the superior mastery of systematically developed abilities (or skills) and knowledge in at least one field of human activity to a degree

that places an individual within the top 10% of age peers who are or have been active in that field.
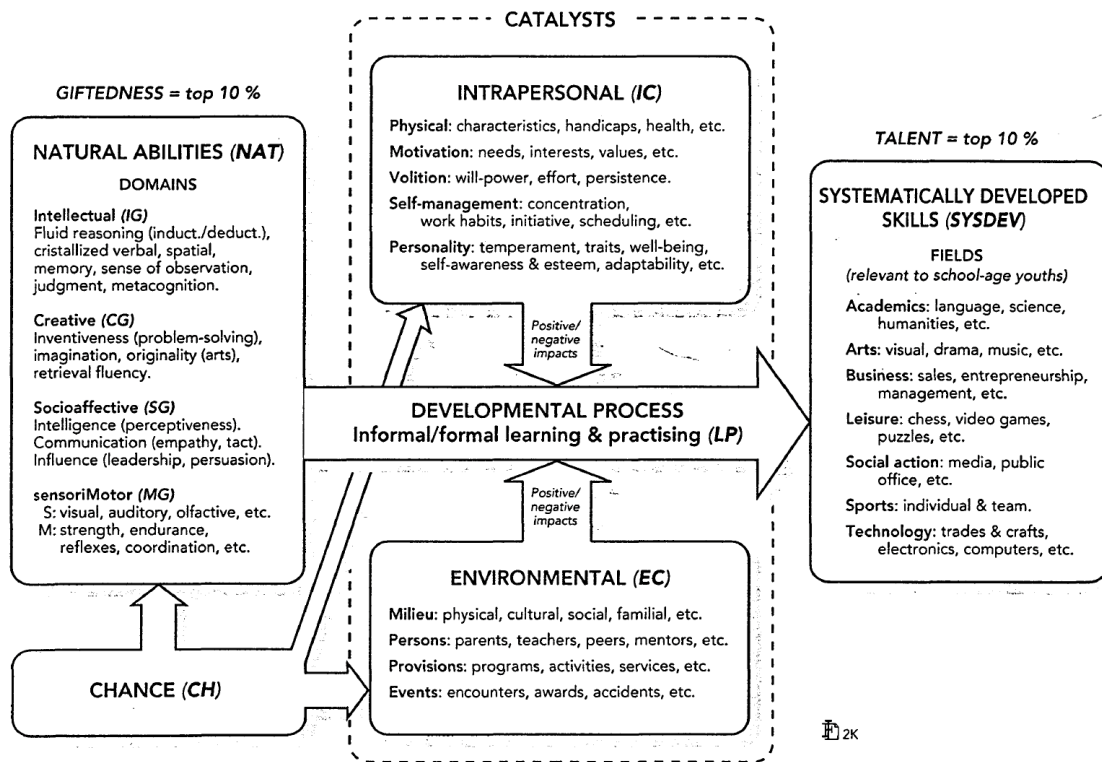


Figure 2.1. Gagné (2000) Differentiated Model of Giftedness and Talent.

Gagné (2000) proposed that one cannot be talented without first being gifted. Moreover, Gagné (2000) suggested that it is possible for exceptional natural abilities to remain as gifts and not be translated into talent, as witnessed through examples of those perceived to be gifted during childhood who failed to transition to the elite level of senior performance (e.g., Collins et al., 2016; Taylor et al., 2022a; Taylor & Collins, 2019). For example, if an individual has exceptional natural gifts, they must still have the motivation to engage in requisite practice and training to fulfil their potential (Collins & MacNamara, 2022). As another example, and reflective of the biopsychosocial nature of development discussed in Chapter 1, if an individual is gifted, they must still develop, possess, refine, and deploy the psycho-behavioural skills

required to cope with and learn from the inevitable challenges that they will face along the pathway, as well as receive the appropriate support and input from the various stakeholders and systems in their pathway to manage those challenge experiences (Collins et al., 2016; MacNamara et al., 2010a, 2010b; Savage et al., 2017, 2022; Taylor et al., 2022a, 2022b; Taylor & Collins, 2019, 2020). On the other hand, elite athletes may also be able to compensate for a lower level of giftedness in some components (e.g., a physical component) with superior strengths in other components (e.g., a psychological component) (Collins & MacNamara, 2012; MacNamara et al., 2010b; Vaeyens et al., 2008). In essence, there is no single profile that typifies success and different types of performers can translate their gifts into talents and achieve elite performance by exploiting their strengths and compensating for their weaknesses (Abbott et al., 2005). Thus, excellence in sport is not idiosyncratic to a specific set of skills or attributes, but can be achieved through unique combinations of skills, attitudes and behaviours (Baker et al., 2019; Bjørndal & Ronglan, 2019; Collins & MacNamara, 2022; Vaeyens et al., 2008).

In line with this argument, Abbott et al. (2005) have called for the need to conceptualise talent as a multidimensional construct and to acknowledge that many of the key performance determinants in sport can be developed with appropriate training opportunities. Reflecting this proposition, talent is now recognised as a biopsychosocial concept, with TD seen as a complex, dynamic, and typically non-linear process (Abbott et al., 2005; Collins & MacNamara, 2019). In sum, talent is an individual, multi-dimensional, emergenic (i.e., result of diverse multiplicative processes), dynamic (i.e., its expression evolves over time due to interactions with the environment), and symbiotic (i.e., subject to environmental constraints/influences) concept that cannot be aggregated to a single score, is comprised from different combinations of different abilities, and emerges across unpredictable time courses (Baker et al., 2019; Baker & Wattie, 2018; Bjørndal et al., 2018; Collins & MacNamara, 2022; Gulbin et al., 2013).

## 2.2 Developing Talent in a Sporting Pathway

As outlined in Chapter 1, one primary aim of any talent pathway in sport is to develop athletes with the ability to perform at the highest level (Collins et al., 2019). In line with Figure 2.1, Gagné (2000) proposed that TD is influenced by an interactive dynamic of biopsychosocial factors. In the DMGT, the rate of TD is influenced by three significant catalysts: chance factors, intrapersonal catalysts, and environmental catalysts. Intrapersonal catalysts are subdivided into physical (e.g., genetic predisposition, health status) and psychological (e.g., psychological skills; concentration, self-awareness, persistence) factors under the partial influence of genetic endowment. Environmental (or social) catalysts manifest its significant impact in many ways, both at the macroscopic level (e.g., geographic, demographic, sociological) and microscopic context (e.g., size of family, relationships with siblings, parenting style, socioeconomic status). On the other hand, chance is spontaneously associated with the environment; for example, the chance of being born in a particular location or into a particular family or the chance of suffering a major accident or injury. The influence of chance can also manifest itself in both the gifts and intrapersonal components of the model through the randomness inherent in the transmission of genetic endowment (Gagné, 2000) (Figure 2.1).

Building from the work of Gagné (2000), Collins & MacNamara (2022) have conceptualised the process of developing talent in a sporting pathway as a series of inputs and outputs. Giftedness, the high levels of natural abilities and aptitudes, is the input into the TD system. Contrastingly, talent, the systematically developed abilities or competencies, is the output of the TD system (Figure 2.2). The DGMT describes the coaching process that transforms gifts or natural ability (the input) into expert performance or talent (the output) via learning and practice (Collins & MacNamara, 2022; Gagné, 2000). As outlined by Collins & MacNamara (2022), when a young performer enters the talent pathway, they have the potential

to transform their gifts into talent. However, talent itself develops over time in response to appropriate coaching and an appropriate development environment, alongside the complex interplay of biopsychosocial factors (e.g., Figure 2.1) that may facilitate or impede development.
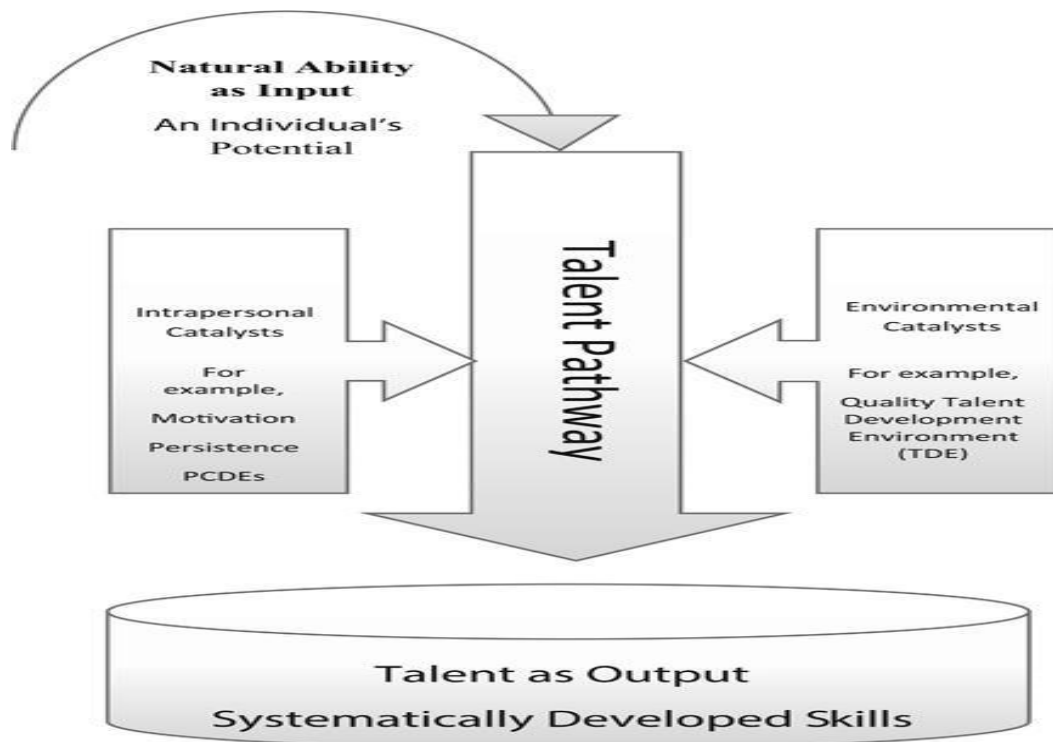


Figure 2.2. Inputs and outputs in TD systems (Collins & MacNamara, 2022).

With increasing intention on the need to provide the optimal environment for athlete development, many sporting systems have focussed on the identification and selection of talent during the early phases of youth development (Baker et al., 2018). As stated in Chapter 1, talent identification and selection in professional football can take place from as young as seven years of age (English Premier League, 2011; Read et al., 2016). However, athletes follow individualised, unpredictable, and typically non-linear developmental trajectories (Abbott et al., 2005) that may not always reflect the structures provided by academy settings. It is for this reason that the efficacy of early selection has consistently been questioned in the literature (Abbott et al., 2005). In addition, with obvious differences between contexts, it appears that

the factors that predict early selection are orthogonal to those predicting later high performance (Barth et al., 2022).

Reflecting this non-linearity, and the issue of conflating conversion rates with the quality of the development environment, most youth footballers selected into the system at early stages of the pathway do not transition to the elite senior level (Güllich, 2014; Güllich et al., 2023; Herrebrøden & Bjørndal, 2022; Schroepf & Lames, 2018). This is reflective of the limited 'spots' available at the highest levels of the sport and the pyramid design that is typical of TD pathways (Curran, 2023). Güllich (2014) examined the talent identification and development programmes within German national and academy level football over a twelve-year period with a total of 1059 under 10 to under 19 youth players analysed, identifying an average annual turnover rate of 24.5% at the academy level and 41% at the national level, with only 7% of players identified at the under 10 age group remaining within the system at the under 19 age group. Crucially, the chances of remaining within the pathway three years after selection was less than 50% (Güllich, 2014). Similarly, Herrebrøden & Bjørndal (2022) explored the link between youth international experience at the U17, U19 and U21 levels and subsequent elite experience (international appearances at the senior level, and senior appearances at club Champions League and/or Europa League level) in 1482 footballers across Sweden, Denmark, Norway, Germany, Belgium, and Portugal. Whilst participation at the U21 level was an indicator of senior success in football, U17 participation was either an insignificant or negative predictor of subsequent participation in international football. Players at the U17 level were also less likely to gain experience at U19 and U21 levels compared to those players with no U17 experience (Herrebrøden & Bjørndal, 2022). Schroepf & Lames (2018) examined the career patterns of 636 national team footballers born between 1987-1994 who represented Germany at any stage from U16 through to the senior international team, identifying a total

dropout rate of 73.5% from the U16-U21 squads, with most players' (38%) national youth team careers lasting only one year (Schroepf & Lames, 2018).

Reflecting these points, Abbott et al. (2005) propose an approach to talent identification and development that reflects both performance dispositions and the capacity of an individual to develop in the long-term. Due to the range of dynamic subcomponents of talent, the identification and development processes that an athlete experiences are suggested to share an important reciprocal relationship (Abbott et al., 2005). This proposition has been reiterated by Collins and MacNamara (2022) who propose a switch in focus from identifying talent to the need to pay due consideration to performance in the future and the process of development required to achieve expertise. In essence, it is suggested that talent identification and development are considered as combined processes that emphasise direction and development (Abbott et al., 2005; Collins & MacNamara, 2022). Whilst the development and subsequent success of a talented young athlete is influenced by coaching and a variety of innate, psychological and behavioural factors, the successful progression of a young athlete is also largely dependent upon their specific TDE, with many key environmental factors having the potential to exert a positive or negative influence on the process of development (Baker et al., 2018; Bjørndal et al., 2016; Bjørndal et al., 2018; Bjørndal & Ronglan, 2019; Gagné, 2000; Henriksen et al., 2010a, 2010b; Henriksen & Stambulova, 2017; Martindale et al., 2007).

## 2.3 Talent Development Theories: Early Specialisation and Sporting Diversification

The process of development within sport has been suggested to be influenced by either early specialisation (Ericsson et al., 1993) or a pattern of sampling and sporting diversification (Côté & Vierimaa, 2014). Ericsson et al. (1993) proposed a theory termed Deliberate Practice to explain the acquisition of expert performance. Deliberate practice is a highly structured,

domain-specific, goal-orientated, effortful activity undertaken regularly with the explicit goal of improving performance (Ericsson et al., 1993). Deliberate practice is not inherently enjoyable but is suggested to be instrumental in improving performance (Ericsson et al., 1993). It is proposed that differences between experts and non-experts in sport can be explained by the differences in the amount of purposeful high-quality domain-specific deliberate practice accumulated (cf. Andersen et al., 2015). The popular interpretation is that 10,000 hours of deliberate practice extended over a duration of more than ten years is the necessary requisite to acquire expert level performance in a given domain (cf. Gladwell, 2009). The underlying literature underpinning this theory (cf. Ericsson et al., 1993) is drawn from across a range of domains including sport, music, mathematics, ballet, linguistics, and art. Indeed, Ericsson et al. (1993, p. 389) suggested that 'the higher the level of attained elite performance, the earlier the age of first exposure as well as the age of starting deliberate practice'. Drawing on the work of Anders Ericsson, many scholars have advocated for the benefits of early specialisation in the development of athletic talent (e.g., Sieghartsleitner et al., 2018; Zibung & Conzelmann, 2013). Though often inconsistently defined, Jayanthi et al. (2013) defined early specialisation as 'year-round intensive training in a single sport at the exclusion of all other sports'. Early specialisation is viewed as a necessary means to an end when the main emphasis is to accumulate the high amounts of purposeful high-quality domain-specific practice (e.g., Ericsson et al., 1993) to excel in sport (cf. Andersen et al., 2015).

Contrasting to the theory of early specialisation, Côté and colleagues have proposed the Developmental Model of Sport Participation (DMSP) as a different participatory model to build the foundations for elite level senior performance (Côté, 1999; Côté et al., 2007, 2009; Côté & Fraser-Thomas, 2007; Côté & Hay, 2002; Côté & Vierimaa, 2014). Côté (1999) suggested that there are three distinct stages of development specific to sport: 1) the sampling years (age 6-12 years), 2) the specialising years (age 13-15 years), and 3) the investment years

(age 16+ years). Contrasting to deliberate practice, deliberate play activities in sport are those designed to maximise inherent enjoyment and are regulated by flexible rules adapted from standardised rules and are set up and monitored by the children/adults involved in the activity (Côté et al., 2007; Côté & Fraser-Thomas, 2007; Côté & Hay, 2002). The DMSP suggests that high amounts of deliberate play and diverse sporting exposure during the sampling years (until age 13) builds a solid foundation of intrinsic motivation through involvement in activities that are enjoyable and promote intrinsic regulation (Côté and Vierimaa, 2014). Moreover, the DMSP suggests that high amounts of deliberate play during the sampling years establishes a range of motor and cognitive experiences that children can ultimately bring to their principal sport of interest (Côté and Vierimaa, 2014). Through sampling various sports and engaging in deliberate play, the sampling years are considered essential building blocks for self-regulated involvement in elite sport during adolescence and adulthood (Côté et al., 2009).

According to the DMSP, once children reach the age of 13, they then can either specialise in their chosen sport or continue in sport at a recreational level (Côté & Vierimaa, 2014). For elite senior performance, it is suggested that when children reach the specialising years at age 13, they engage in fewer activities during this 'transition phase' (including deliberate play and practice), and then when they reach the investment years at age 16, they commit to only one activity and engage predominantly in deliberate practice (Côté et al., 2007). By age 16, following the DMSP, it is proposed that children have then developed the physical, cognitive, social, emotional, and motor skills needed to invest their effort into highly specialised training in one sport and have avoided the proposed risks of injury, burnout, and overtraining associated with early specialisation (Côté & Vierimaa, 2014).

The literature underpinning the DMSP framework (e.g., Côté, 1999; Côté and Vierimaa, 2014) is predominantly based upon North American high school children. Indeed, the three stages of sports participation described by Côté (1999) that underpin the DMSP were

based upon research with four Canadian families in the sports of rowing and tennis. Moreover, recent reviews and revisions of the model have been framed predominantly within a North American sporting context (e.g., Côté et al., 2007; Côté and Fraser-Thomas, 2007; Côté and Vierimaa, 2014). Subsequent research in support of Côté's (1999) stages of development specific to sport have, again, been framed predominantly within a North American context (e.g., Baker et al., 2005; Soberlak & Cote, 2003). As such, the specific ages and stages of the model are unlikely to directly apply to the European context given the cultural differences in TD systems across nations (Martindale et al., 2007) and the differences in developmental provision between North American and European contexts, even within the same sport (e.g., Holt, 2002). The DMSP will be explored further in Chapter 3.

Crucially, in both the theory of early specialisation and the DMSP, learning and development are suggested to be linear and predictable (Andersen et al., 2015). As Simonton's (1999) Emergenic and Epigenetic Model suggests, talent is a multifaceted quality and reflects the relative contribution of physical, physiological, sociological, cognitive, and dispositional traits that may facilitate (or impede) the acquisition of expertise, with each quality emerging at different rates for different individuals. As outlined in Chapter 1, it is for this reason that athletes can be best thought of as developing along an individualised, unpredictable, and non-linear developmental trajectory (Abbott et al., 2005). Consequently, both the DMSP and the theory of early specialisation are limited in that they do not account for the individualised and non-linear nature of development and the range of biopsychosocial factors that have the potential to facilitate or impede development (Baker et al., 2019; Baker & Wattie, 2018; Collins & MacNamara, 2022; Gagné, 2000).

Notwithstanding these limitations, many scholars have suggested that, at different stages and related to biological maturation and the ability to cope with practice schedules, young athletes need varied and individualised types, volumes and intensities of sporting

practice and engagement (Pankhurst & Collins, 2013). As Baker et al. (2021) suggest, engagement in youth sport, and TD in general, are far more complex and more research is required within the specialisation and diversification debate before appropriate recommendations can be provided across youth sport domains or specific sports. In this regard, Baker et al. (2021) argue that there is a lack of clarity regarding the specific mechanisms driving any positive or negative effects of early specialisation, as well as a lack of critical inquiry into key stakeholder influences on, and viewpoints of, early specialisation and diversification. The literature pertaining to the early specialisation and diversification debate specific to a football context will be synthesised and critically discussed in further detail in Chapter 3.

## 2.4 Talent Development Environments

Moving beyond descriptive accounts of practice and play, as outlined in Chapter 1, there is a growing appreciation that athlete development is not the responsibility of a single individual within the environment, but rather that it is the collective responsibility of the environment itself (Bjørndal & Ronglan, 2018). As discussed in section 1.2 of Chapter 1, the TD milieu in Irish football is particularly complex, with multiple stakeholders impacting the development of the athlete both within and across environments. To date, however, there has been no investigation into the complexity of the TDE in which young Irish players develop and the multiple stakeholders that they interact with. These outcomes will be addressed in Chapter 4.

Whilst there are many different stakeholders that inhabit the TDE (e.g., scouts, academy managers, teachers, peers) (Bjørndal et al., 2017; Bjørndal & Ronglan, 2018), the NGB, coaches, and parents represent three key stakeholders within the TD process (Pankhurst & Collins, 2013). Parents' role in TD has been highlighted regularly within research (Côté, 1999; Gould et al., 2002, 2006; Wolfenden & Holt, 2005). Parents can adopt a role of leadership

during their child's earlier years of development, shifting to a more of a supportive role as the athlete approaches and transitions through adolescence (Côté, 1999). Parents often provide emotional support as their child experiences the psychological stress and challenges of high-level competition (Côté, 1999), which is vital given the non-linear and challenging nature of the 'rocky road' to the top (Collins & MacNamara, 2012). Alongside parents, there is a plethora of research attesting to the central role of coaches in supporting TD in youth sport (Abraham & Collins, 2011; Henriksen et al., 2010a, 2010b; Wolfenden & Holt, 2005) and within youth football specifically (Cushion et al., 2012; Larsen et al., 2013; O'Connor et al., 2018; Smith & Cushion, 2006). Within football, coaches have significant influence and control over player development and the sociocultural dynamics of the learning environment (Cushion et al., 2012). The actions of the coaches can impact the behaviour, cognition, and affective responses of players, and have a marked influence on young players' overall development (Cushion et al., 2012). Crucially, coaches are often the individuals responsible for identifying talent, although their role in this talent identification process is influenced by their experiences in a specific coaching culture (Christensen, 2009; Lund & Söderström, 2017). The NGB, as the 'system controller' has responsibility for the policies and systems in the sport, including the coach education system (Pankhurst & Collins, 2013). However, in comparison to the other two stakeholders, the role of the NGB in talent identification and development has attracted relatively less research attention. Parents, coaches, and members of the NGB (the FAI) form the platform of stakeholders examined in Chapter 4.

### 2.4.1 Holistic Athlete Development

Effective TDEs 'aid the development of those who have been identified as talented' (Martindale et al., 2007, p. 202). Those TDEs in sport that are suggested to be the most successful are those that manage to continually produce top-level athletes on the basis of their

junior athletes and provide them (their junior athletes) with the resources for coping with future transitions (Larsen et al., 2013). Henriksen & Stambulova (2017, p. 272) define the TD process in sport as 'the progressive mutual accommodation that takes place between an aspiring athlete and a composite and dynamic sporting and non-sporting environment that supports the development of the personal, psycho-social and sport-specific skills required for the pursuit of an elite athletic career'.

Young athletes will simultaneously engage with various sporting (e.g., school, grassroots clubs, academies, national representative squads) and non-sporting (e.g., school) environments and stakeholders (e.g., parents, coaches, peers) throughout their time in the talent pathway (e.g., Curran et al., 2022). Given both the complexity and variation in the environments that young athletes inhabit, Henriksen et al. (2010a, 2010b) emphasise the importance of a cohesive TDE with the relationship between stakeholders at its core. Henriksen et al. (2010a; 2010b) introduced a holistic ecological approach to the study of TDEs, placing a focus on the environment in which the athletes develop rather than solely on the athletes themselves, encapsulating the young athlete's social relations both inside and outside of their sporting context (cf. Henriksen et al., 2010a, 2010b). In this regard, Henriksen et al. (2010a, p. 213) proposed the 'Athletic Talent Development Environment' (ATDE), which is defined as 'a young athlete's social relations both inside and outside of the world of sport - social relations which have a sports club or team as their core but also include the larger context in which the club or team is embedded'. In essence, the ATDE is viewed as the totality of the athlete's ecosystem, both inside and outside of sport. Henriksen et al. (2010a, 2010b) proposed the ATDE model (Figure 2.3) and the Environmental Success Factors (ESF) model (Figure 2.4) to

describe the structures and factors that contribute to successful development environments for

young athletes.
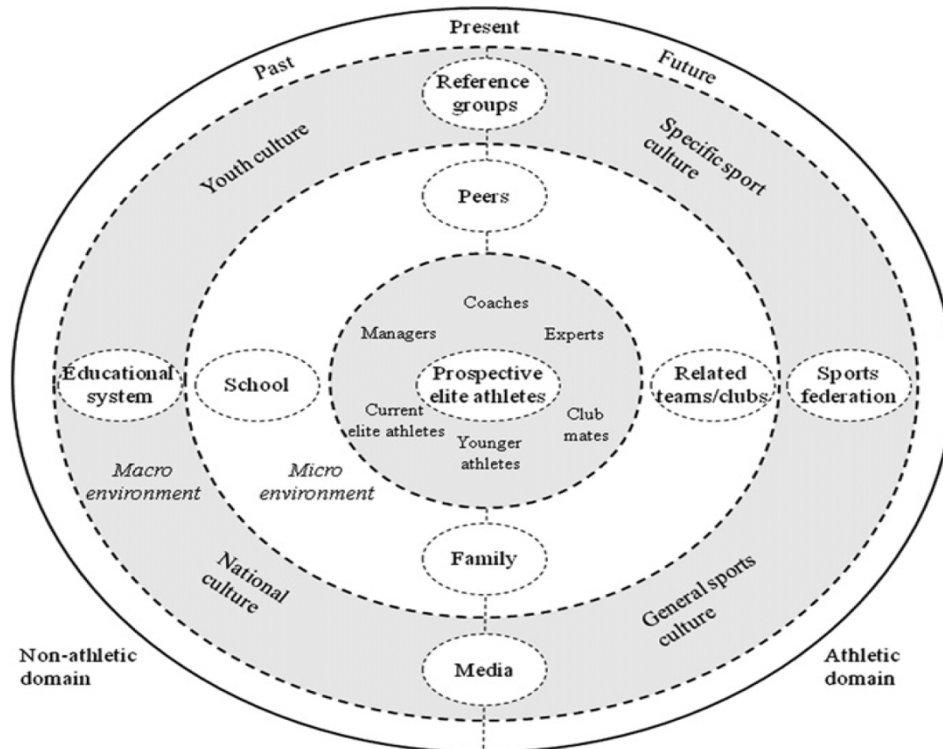


Figure 2.3. The ATDE working model (Henriksen et al., 2010a).
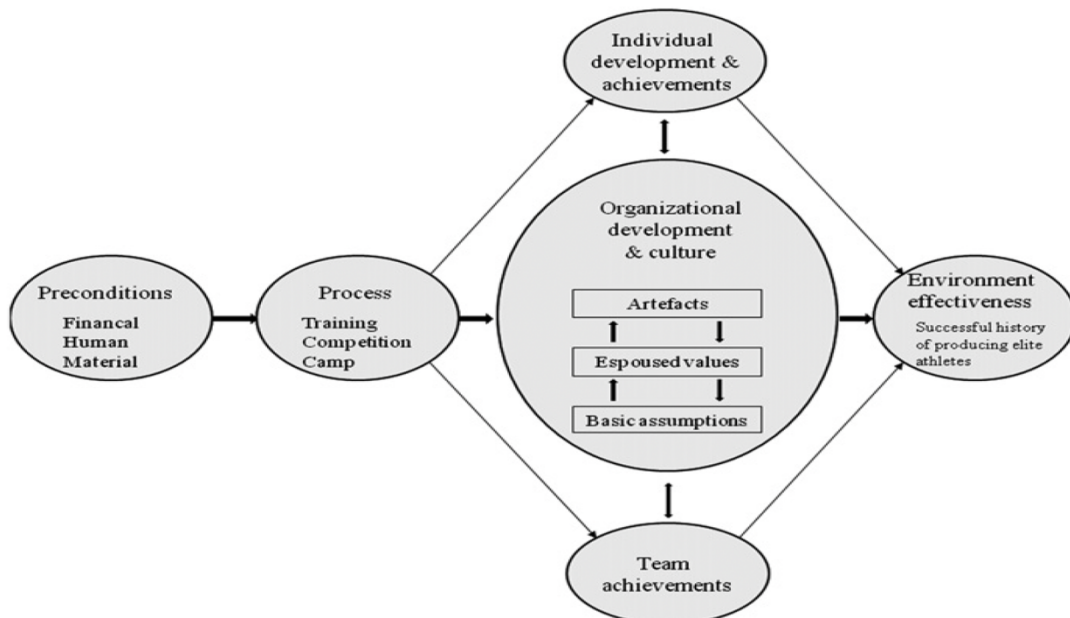


Figure 2.4. The ESF working model (Henriksen et al., 2010b).

**2.4.2 Characteristics of Effective Talent Development Environments**

In their analysis of successful ATDEs in the Danish sailing and the Swedish track and field context, Henriksen et al. (2010a, 2010b) identified a strong organisational culture, characterised by values of open co-operation, individual responsibility, and a focus on the performance process to underpin core elements of success. Moreover, successful development environments were characterised as hierarchical but open and sharing in all systems of sport related and non-sport related communication, whilst limiting parental involvement and encouraging athletes to be autonomous (Henriksen et al., 2010a, 2010b). A focus on long-term athlete development represented a primary component of a successful TDE in these contexts (Henriksen et al., 2010a, 2010b). From a coaching perspective, coaches encourage athletes to experience fluctuations in challenge levels, emphasise the importance of developing psycho-behavioural skills (e.g., responsibility, drive for excellence, social skills), and evaluate athlete effort and attitude over skill level and results (Henriksen et al., 2010a, 2010b). The holistic ecological approach outlined three common characteristics that exist within successful development environments within these contexts: 1) a sense of belonging, 2) psychological well-being, and 3) a strong degree of cohesion and connection within the sporting organisations wider context (Henriksen et al., 2010a, 2010b).

Martindale and colleagues (Martindale et al., 2005, 2007) provided a detailed framework for the key features of effective TDEs across sporting organisations in the UK. Martindale et al. (2005, p. 354) defined the TDE as 'all aspects of the coaching situation' that impact on the athlete's development. Whilst Henriksen et al. (2010a; 2010b) employed a holistic ecological approach to their study of TD, one that focussed on the broader environmental context, Martindale et al. (2007) focused exclusively on the sporting domain and the coaching context. Based on interviews with 16 TD coaches across 13 different sports, Martindale and colleagues (Martindale et al., 2007) identified that (1) developing long-term

aims and methods, (2) providing wide-ranging coherent messages and support, (3) emphasising appropriate development, not early success, (4) providing individualised and ongoing development, and (5) providing integrated, holistic, and systematic development as characteristics of effective TDEs. Whilst the research of Henriksen et al. (2010a; 2010b) suggests a holistic ecological approach in understanding the intricacies of successful TDEs in a specific sporting/club context, the work of Martindale and colleagues (2007) adopts a broader approach, identifying key features of effective TDEs across contexts. Although the work of Henriksen et al. (2010a; 2010b) and Martindale et al. (2005; 2007) bear some slight differences, one consistent feature of effectiveness across contexts is the importance of a coherent pathway. A coherent pathway experience has also been suggested as vital in maximising athlete progression to the elite senior level in other contexts (Bjørndal & Ronglan, 2019; Curran et al., 2021; Webb et al., 2016). The extent to which coherence exists between stakeholders in an Irish football context is explored in Chapter 4.

### 2.4.3 Coherence as a Key Feature of Effective Sporting Talent Development Environments

The TDEs of team sports are complex (Curran et al., 2022; Bjørndal & Ronglan, 2018; Bjørndal et al., 2017). As outlined in Chapter 1, the NGBs of such systems (e.g., the FAI) present multiple contexts (e.g., school, club, regional, national) that operate simultaneously on the talent pathway (Curran et al., 2021; 2022; Bjørndal & Ronglan, 2018; Bjørndal et al., 2017). The extent to which there is alignment in perceptions, understanding, and behaviours across each stakeholder within such contexts is a crucial element of TD (Webb et al., 2016). As Pankhurst & Collins (2013) highlight, the success of a young athlete depends upon each key stakeholder deploying their specific skills, having commonality in their knowledge of TD, and

having an understanding of the talent identification and development process itself, in addition to the existence of quality relationships between each of these key stakeholders.

Coherence is a situation where the different elements of an athlete's experience hold logical connection and are mutually reinforcing (Taylor & Collins, 2020). Stakeholder coherence can be seen horizontally across a level of performance, where athletes experience complimentary coaching and adaptive support based upon changing demands, and coherence can also be seen vertically, where multiple stages of the pathway build chronologically from previous involvement toward long-term needs (Taylor & Collins, 2021). A lack of coherence between stakeholders can impact a young athlete's success as a result of mixed messages, confused agendas and a lack of clear direction and directives (Pankhurst & Collins, 2013). The role of coherence in TD will be discussed further in section 2.4.4.

To generate coherence for the athlete, it has been suggested that there is a need for integration within and outside of talent systems (Taylor & Collins, 2020). Integration refers to the extent to which a variety of different inputs to the athlete are systematically combined (Taylor & Collins, 2021). Horizontal integration of different processes would see stakeholders across a stage working with the athlete in an agreed fashion to optimise their experience, and vertical integration would see the coordination of working practices through the different stages of an organisation or pathway (Taylor & Collins, 2021). In this regard, coherent talent pathways are characterised by logical, intentional, progressive, and consistently applied coaching methods that are complementary (rather than identical), adaptive (rather than resistant) to changing demands and challenges, and specifically designed and combined in an age and stage appropriate manner (Webb et al., 2016). Thus, all work within the training environment will align with the systems objectives for each developmental stage and will lock into what has come at the preceding stage of the pathway and what is to come at the next stage (cf. Webb et al., 2016). In essence, coherence is at the centre of an efficient development environment, and

45

a cohesive philosophy between stakeholders, characterised by clearly defined core values, expectations, and behavioural standards, represents optimal developmental conditions for young athletes (Mills et al., 2014a, 2014b).

### 2.4.4 The Ramifications of an Incoherent Pathway Experience

Curran et al. (2021, 2022) examined the TDE of an amateur national hockey organisation where young female athletes compete on multiple teams, contending with various coaches and contexts (e.g., school, club, national representative squads), much like the FAI's player pathway outlined in section 1.2 of Chapter 1. A lack of coherence was observed across the pathway, characterised by poor levels of communication between coaches across developmental contexts, a misalignment in expectations between stakeholders and the international age groups, a lack of an integrated systematic approach, and a perceived lack of attention to the holistic development of players (Curran et al., 2021). Moreover, there appeared to be a lack of direction and support from the NGB, and pathway staff members and players had different perceptions regarding the performance goals and outcome measures of the pathway stages (Curran et al., 2022). A lack of pathway coherence has also been observed in a rugby league context in England, whereby clubs have difficulty coordinating and working effectively with the key stakeholders in player development due to the number of different individuals that populate the overall TD milieu (Taylor & Collins, 2022b).

In an investigation into the TDEs of football academies in Sweden, high-quality environments were characterised by well-established relationships between key stakeholders, whereas in low-quality environments, academy players experienced deficiencies in their support network with a lack of established relationships between stakeholders, including between coaches and parents (Ivarsson et al., 2015). In a similar investigation framed within a UK context, Mills et al. (2014a) qualitatively examined the factors perceived by ten expert

coaches from ten professional football academies to underpin optimal TDEs specific to football. The findings highlighted the need for an integrated approach to TD that establishes a strong link between players, parents, and club staff. However, a lack of organisational proximity and communication between youth and professional environments has been observed in many football clubs across Europe, hindering youth players' progression into professional football (Relvas et al., 2010). Likewise, several recent investigations into the talent systems of football academies in the UK have identified a lack of coherence and integration across the pathway, characterised by low levels of communication and misalignment in expectations and processes between coaches and parents (Clarke & Harwood, 2014; Harwood et al., 2010). In such instances, players may experience incoherent, and potentially directly contradictory, messaging between environments (Taylor et al., 2022b). Indeed, a misalignment in behaviours and messaging between coaches and parents to the athlete has been shown to be a significant factor inhibiting athlete progression from the youth to senior level (Taylor & Collins, 2019).

Building on these findings, Sæther et al. (2022) investigated the experiences of Norwegian youth football players undertaking dual careers as student-athletes from either sports friendly schools or elite sports schools. Students enrolled in sports friendly schools were affiliated with a second or third division senior club, but no formal affiliation existed between the players' club and school, meaning players had different coaches across different environments. Students enrolled in the elite sports programmes were affiliated with a professional first division club, with an established collaboration between players' club and school, meaning players had the same coach across environments. The close integration of the school and club settings in the elite sports programmes enabled coaches and student-athletes to plan and manage their overall workload and development more easily. In contrast, those student-athletes enrolled in the sports friendly programmes without such integration

experienced more concerns related to workload coordination and were at an increased risk of overuse injury (but were also given more responsibility to plan and coordinate their own workloads and school pressures which had positive effects on independence and self-determination). Similarly, Bjørndal et al. (2017) identified that youth athletes competing in the Norwegian handball talent pathway experienced a lack of coherence between the multiple environments in which they were involved (i.e., club, school and national level). This lack of coherence was characterised by workload mismanagement, misalignment in athlete expectations and a lack of planning which led to losses in athlete motivation, excessive physical workloads, underperformance, and an increased risk of injury. The lack of coherence between policies and practices across athlete's different environments can hinder coaches' ability to facilitate TD. In some cases, posing a threat to overall well-being through insufficient recovery, injury or burnout (Bjørndal & Ronglan, 2018).

However, relating back to the limitations in TD research outlined in Chapter 1, much of the research pertaining to coherence in TD has revolved around the environment and culture surrounding a single club, age group or professional academy (cf. Curran et al., 2021). Although insightful, such research does not provide the full picture of athlete development across a complex national organisation, such as the FAI (see Chapter 1, section 1.2), where players compete across multiple environments under the influence of a multitude of different stakeholders (cf. Curran et al., 2021). As discussed at the start of section 2.4, TD is not the responsibility of a single person or club within an environment, but more the collective responsibility of the sporting organisation itself, where stakeholders at all levels communicate, share knowledge and work together towards long-term athlete development (Bjørndal & Ronglan, 2018; Curran et al., 2021). In this regard, Curran et al. (2021) have called for the need for further and richer qualitative research into the effectiveness and efficiency of TDEs on a broader scale, accounting for the multiple and complex environments athletes inhabit across a

national organisation. These outcomes will be addressed in an Irish football context in Chapter 4. Of the limited research that has examined coherence across a national organisation (e.g., Bjørndal et al., 2017; Bjørndal & Ronglan, 2018; Curran et al., 2021, 2022), these investigations have been delimited to alternative sporting pathways (i.e., handball, hockey) and do not reflect the structures and processes of a professional Football Association (see Chapter 1, section 1.2).

## 2.5 Access to the Talent Development Environment

Whilst TD is a complex, dynamic and non-linear process (e.g., Abbott et al., 2005; Abbott & Collins, 2004), the evidence presented in section 2.4 suggests that a coherent pathway experience appears to be one key systemic element that can help to support this process (Bjørndal et al., 2018; Bjørndal & Gjesdal, 2020; Curran et al., 2021, 2022; Martindale et al., 2005, 2007). As discussed in Chapter 1, there is significant and increasing pressure for Football Associations to select and develop athletes to the senior elite standard (cf. MacNamara, 2022). Establishing a coherent pathway experience for young players, therefore, should be a strategic priority of each national association (Curran et al., 2021, 2022).

As outlined in section 2.2, however, most youth footballers selected into formalised talent pathways do not transition to the elite senior level (e.g., Güllich, 2014; Herrebrøden & Bjørndal, 2022; Schroepf & Lames, 2018). Of significant and ongoing debate in the TD literature, therefore, is the timing of and access to selection, along with the way in which athletes are developed. Indeed, concerns have been raised about the influence of the football academy experience on young players and the challenges posed by early selection and deselection decisions (Mitchell et al., 2020; Relvas et al., 2010). Whilst early selection may present an opportunity to shape athlete development over time (e.g., Hendry & Hodges, 2018), Erikstad et al. (2021) argued that early (de)selection processes may reduce individual

opportunities for long-term engagement and personal development. Two factors that have been examined in depth by the extant literature as influencing selection dynamics in this regard are biological maturation and relative age (e.g., Cobley et al., 2009; Hill et al., 2020; Johnson et al., 2017; Lovell et al., 2015; McCarthy et al., 2022; Towlson et al., 2022).

## 2.5.1 The Relative Age Effect (RAE)

Relative age represents chronological age relative to the individual birthdate and competition cut-off dates (Hill et al., 2020). The RAE is a selection bias in favour of those born earlier in the selection year, whereby those born toward the start of the selection year (i.e., 1st January), who are chronologically older than those born toward the end of the selection year (i.e., 31st December), are disproportionately overrepresented within talent systems. Typically, relative age is expressed via birth quartiles, with individuals born in the first three months of the selection year classified as quartile one, and individuals born in the last three months of the selection year classified as quartile four (Kelly et al., 2021; Lovell et al., 2015).

As outlined in Chapter 1, evidence across TD contexts indicates that the traditional identification and selection of young athletes is often based upon a linear and static conceptualisation of talent (e.g., Bergkamp et al., 2019), which, resultantly, leads to the over selection of those with early advantages (Abbott & Collins, 2002). The prevalence of these early advantages is illustrated at the population level with a significant proportion of academy populations slanted towards those youth athletes born in the first two quartiles of the year at the expense of those born in the third and fourth quartiles (e.g., Brustio et al., 2018; González-Víllora et al., 2015; Hill et al., 2020; Johnson et al., 2017; Lewis et al., 2015; Lovell et al., 2015; Till et al., 2009).

In an investigation of 1212 players aged eight to eighteen years from 17 professional football academies, Lovell et al. (2015) identified that players born in the first quartile

constituted 49% of all players selected, with players born in quartile four comprising just 9%. These findings are similar to that of Hill et al. (2020) who investigated the RAE within an English Premier League academy over an eight-year period and identified that of the 202 under nine to under sixteen players selected, 55% were born in quartile one, with just 13% born in quartile four. Till et al. (2009) identified that the RAE existed in English rugby league talent pathways, with 47% of regional and 56% of national-level players born in the first quartile. In an investigation of Welsh rugby union talent pathways, players born in the first half of the year accounted for 72% and 80% of total squads at the regional and national levels (Lewis et al., 2015). The disproportionate over selection of athletes/players born in the first two quartiles of the selection year appears consistent across other youth sports and contexts (e.g., Bjørndal, Luteberget, et al., 2018; Brustio et al., 2018; de la Rubia et al., 2021; González-Víllora et al., 2015; Parr et al., 2020a; Rubia et al., 2020).

Till et al. (2009) and Lewis et al. (2015) suggest that the magnitude of the RAE increases with increasing levels of competition, and is thus, more prominent at regional and national levels than at the club and grassroots levels. Evidence from English rugby union suggests that the RAE is present across all underage grades from U7-U18 (Kelly et al., 2021). In some contexts, the RAE appears to remain relatively stable with chronological age (Hill et al., 2020; Johnson et al., 2017), whereas in others (e.g., Bjørndal, Luteberget, et al., 2018; Rubia et al., 2020), it appears to dissipate at the senior level. The magnitude of the RAE also differs across genders and national contexts (de la Rubia et al., 2021). Relative age selection biases in sporting talent pathways can exist in children from as young as six years of age (cf. Towlson et al., 2022).

The literature has proposed that the multitude of attributes causing the RAE are primarily related to age, experience, and developmental differences (e.g., game knowledge and understanding, decision making, neuromuscular development, cognition, behavioural and

psychological development, social development) that are present from early childhood (Hill et al., 2020; Parr et al., 2020a). It is often incorrectly assumed that athletes born early in the selection year benefit from advanced maturation, but this is not necessarily the case, and as such, relative age and biological maturation and their associated biases should be recognised as independent constructs (Bolckmans et al., 2022; Hill et al., 2020; Johnson et al., 2017; Parr et al., 2020a; Towlson et al., 2022). The literature underpinning the mechanisms of the RAE and a review of developmental interventions proposed to manage the associated selection and development dynamics in talent systems will be presented in Chapter 7.

## 2.5.2 Biological Maturation

Biological maturation is another factor associated with early advantage and selection for young athletes (Bradley et al., 2019; Cumming, Brown, et al., 2018; Cumming, Searle, et al., 2018; Hill et al., 2020; Johnson et al., 2017). Biological maturation is the process of progression toward the mature adult state and can be defined in terms of status, timing and tempo (Bradley et al., 2019; Cumming et al., 2017). Maturation status describes the state/stage of maturation that the individual has attained at the time of observation (i.e., pre-pubertal, pubertal, post-pubertal); whereas timing refers to the chronological age at which specific maturation events (e.g., peak height velocity, menarche) occur (Cumming et al., 2017). Tempo refers to the rate at which maturation progresses (Malina et al., 2015). Biological maturation is governed predominantly by a combination of genetic and, to a lesser extent, environmental and behavioural factors (i.e., chronic malnutrition, disease, climate) (Beunen et al., 2006). Human tissues, organs, and organ systems mature; however, this occurs independent of chronological age (Beunen et al., 2006). Thus, youth of the same chronological age can vary substantially in their status, timing, and tempo of maturation (Cumming et al., 2017). For instance, from late childhood, same age peers have been shown to vary by as much as five-to-six years in skeletal

age and somatic maturity, both of which are established indexes of maturation status in youth (Borms, 1986; Gundersen et al., 2022; Johnson, 2015). Thus, a child with a chronological age of 12 could have a skeletal/somatic age anywhere between 9 and 15 years. This is of particular concern to practitioners since individual differences in growth and maturation are central to the identification and development of talented youth athletes (Bradley et al., 2019).

Early maturation elicits numerous physiological, physical, and functional advantages that transfer directly into performance environments (Brown et al., 2017; Buchheit & Mendez-Villanueva, 2014; Gundersen et al., 2022; Hill et al., 2020; Johnson et al., 2017). Early maturing youth generally benefit from increased lean muscle mass, the ability to reach faster peak running speeds, greater running endurance, and increased muscular strength and power relative to their later maturing peers (Brown et al., 2017; Buchheit & Mendez-Villanueva, 2014; Gundersen et al., 2022; Malina et al., 2004; Meylan et al., 2010; Radnor et al., 2021). In youth football contexts, there are concerns that early maturing players may rely on these physical and functional advantages to the neglect of their psychological and/or technical and tactical development (Cumming, Brown, et al., 2018; Cumming, Searle, et al., 2018). While the former may lead to short-term performance advantages, the latter have been highlighted to be central to long-term development (Collins et al., 2019). Early maturation also generally confers greater body stature and mass (Brown et al., 2017; Buchheit & Mendez-Villanueva, 2014). Within chronological age groups, variations in male body mass (~50%), stature (~17%), fat free mass (~21%) and predicted adult height (~10-15%) are not uncommon (Hannon et al., 2020; Salter et al., 2021). As advanced maturation status is associated with increased levels of testosterone (Hibberd et al., 2014) and maturation of the anaerobic system, early maturing athletes also have a greater capacity to adapt to training stimuli (i.e., hypertrophy, anaerobic adaptation), further augmenting their physical and functional advantages. These physical, physiological, and functional advantages provide early maturing athletes with early advantages

over their later maturing peers and increases the likelihood of selection in contexts where these attributes are desirable (e.g., football academies). From the onset of puberty, biological maturation seems to have a stronger influence on selection than relative age in such contexts (Hill et al., 2020; Johnson et al., 2017; Towlson et al., 2022).

Individual differences in biological maturation have been shown to directly (i.e., physiological adaptations) and indirectly (e.g., evaluations and reactions of others to physiological change) influence athlete selection into talent pathways, although most of the literature on biological maturation in respect to talent identification and development has tended to be specific to youth football (e.g., Bradley et al., 2019; Cumming, Brown, et al., 2018; Cumming, Searle, et al., 2018; Hill et al., 2020; Johnson et al., 2017). In an examination of 202 players aged from under 9 to under 16 in one English Premier League academy, Hill et al. (2020) identified a selection bias in favour of early maturing players that emerged from the under 12 cohort and increased linearly with age. Crucially, the authors identified that no players in the under 15 and 16 cohorts were late maturing. The proportion of early maturing players within the system peaked at the under 16 age group, whereby 54% of all players were early maturing. Similarly, Cumming, Searle, et al. (2018) highlighted that a selection bias in favour of early maturing youth players existed in four separate English professional football academies that increased in trend with age. Moreover, Johnson et al. (2017) demonstrated that as players age, they are selected for elite football academies from a biased sample of early maturing boys and those advanced in maturation are up to 20 times more likely to be retained within the academy system. The underrepresentation of late maturing youth within football academies is consistent across the literature (Cumming, Brown, et al., 2018; Cumming, Searle, et al., 2018; Hill et al., 2020; Johnson et al., 2017; Ruf et al., 2021; Zuber et al., 2016). These maturation biases in a youth football context generally seem to emerge at around 11-12 years

of age, coinciding with the onset of puberty, and increase in magnitude with chronological age and the level of competition (Hill et al., 2020; Johnson et al., 2017).

Late maturing youth are, therefore, more likely to be overlooked or excluded from talent pathways, thus denying them access to the specialist coaching, training resources, and high levels of competitive challenge and competition that are typically associated with the academy system (Bradley et al., 2019). Although there is some evidence to suggest that late maturing athletes are proportionally more likely to progress to the adult level than early maturing athletes if retained in the system (Ostojic et al., 2014), late maturing athletes are likely to remain underrepresented at the adult level in absolute terms due to a smaller initial representation within the academy system. The literature underpinning the influence of biological maturity on selection and development, followed by a critical review of the developmental interventions proposed to manage the associated selection and development dynamics in talent systems will be presented in Chapter 7.

Given the proposed physiological advantage conferred by early biological maturation, TD practitioners and stakeholders have expressed concerns over the extent to which biological maturation influences selection and development in talent systems (Taylor & Collins, 2021). In addition, early maturation may confer enhanced self-efficacy and social status, alongside physical and functional performance advantages. Yet, if these advantages dissipate later, there may be maladaptive consequences for early maturing athletes when exposed to higher challenge levels at later stages of the pathway (Taylor & Collins, 2019). Contrastingly, if later maturing athletes lack the ability to cope with chronically low levels of early success, the likelihood of those athletes dropping out of the system is increased (Taylor & Collins, 2020). Importantly, maturation-related advantages are context-dependent; for example, in sports where prepubescent attributes are desirable for successful performance, such as some

gymnastic events, delayed maturation may be advantageous for early performance and selection (Malina et al., 2015).

Like the RAE, the influence of biological maturation on talent identification and development is a complex and multifaceted phenomenon. However, while both the RAE and biological maturation may exist and operate independently, it is important to note that they are both strongly associated with talent identification and development. Those players that are both relatively younger and late maturing likely face a double disadvantage and are the least likely to be selected, although evidence to support this proposition is currently lacking. The influence of biological maturity and the RAE on the selection of Irish players across the national TD system, and their associations, will be explored in Chapter 5 and 6.

Whilst acknowledging that the tracking of maturation is an essential feature of a talent system, it is also important to acknowledge that due to resource limitations, coincided with the invasive nature of other predictive equations, non-invasive predictive equations to determine maturity status are commonly utilised (i.e., percentage of predicted adult height (Khamis & Roche, 1994, 1995) or predicted maturity offset (Mirwald et al., 2002)). Due to the non-invasive and predictive nature of these equations, these methods are associated with a degree of error (e.g., Kozieł & Malina, 2018; Malina et al., 2004, 2007; Mirwald et al., 2002). In some instances, this may lead to athletes' maturation status being categorised incorrectly. The validity of these methods and the limitations of their use in applied practice will be reviewed and discussed in Chapters 5, 6, 7 and 9.

## 2.6 The Role of Challenge in the Development of Talent

### 2.6.1 The Challenge Experience

Biological maturation and relative age are two factors that have been suggested by the extant literature to influence challenge dynamics for athletes (Cumming, Brown, et al., 2018; Cumming, Searle, et al., 2018; Hill et al., 2020; Johnson et al., 2017; Mann & van Ginneken, 2017). In a TD context, a challenge is a memorable experience that is perceived by a performer to have the potential of disrupting development and/or performance in sport (Collins et al., 2019). Challenge dynamics are, therefore, the complex biopsychosocial factors that influence an individual's experience of and interaction with challenge (Nash & Taylor, 2021). The challenge dynamics associated with biological maturation and relative age will be explored in in Chapter 7.

Whilst some challenge experiences can be detrimental to long-term development (Collins et al., 2016; Taylor & Collins, 2019), depending upon the nature and source of the challenge (Taylor et al., 2022b), there are also potential benefits to experiencing and overcoming a degree of challenge throughout development (Collins & MacNamara, 2012; Savage et al., 2017, 2022; Taylor et al., 2022b). In this regard, a significant feature of proposed benefit appears to be the relationship between the challenge dynamics offered by exposure to selective TD environments and the concurrent development of psycho-behavioural skills to learn from and cope with these experiences (Collins & MacNamara, 2012, 2022; MacNamara et al., 2010a, 2010b; Savage et al., 2017, 2022; Taylor et al., 2022a, 2022b; Taylor & Collins, 2019, 2020, 2021). Importantly, it is not the provision of higher challenge, but the type of challenge faced and how the individual athlete responds to that challenge that is a determinant of success (Collins et al., 2016; McCarthy et al., 2022; Taylor et al., 2022b). Rather than directly causing psychological growth, challenge acts to test, prove and encourage previously developed psycho-behavioural skills (McCarthy et al., 2022; Savage et al., 2017). In essence,

it has been suggested that reflection subsequent to challenging experience is the mechanism through which development is generated or catalysed (Taylor & Collins, 2021).

Crucially, athletes must also have the ability and willingness to deploy these psycho-behavioural skills once developed, along with the confidence to keep trying if they do not work at the first attempt (Collins & MacNamara, 2022). Whilst acknowledging the points made in section 1.4 regarding the inconsistency in which elite senior athletes are defined (cf. Swann et al., 2015), literature suggests that the most successful senior athletes are characterised by adaptive reactions to challenges throughout development, both proactively and in reaction to challenges experienced (Collins et al., 2016). In this sense, those athletes that are better able to cope with and learn from the inevitable highs and lows of development are better able to orient their focus in a manner that can help them continue to progress (McCarthy et al., 2022). Reflecting the individualised nature of TD, it is important to note that not every challenge is created equal; athletes experience similar events differently and some challenge experiences are more likely to elicit an adaptive response than others (Taylor et al., 2022b). Moreover, it is not solely the experience of challenge that promotes development; rather, it is the various inputs and influences of stakeholders and systems around the athlete, as well as how the individual athlete conceptualises what they are experiencing, that are key determinants (Taylor et al., 2022b).

### 2.6.2 The Nature of the Challenge Experience

Given the points outlined in the preceding section, it is important to consider the nature of the challenge experience. Collins et al. (2016) retrospectively examined the factors associated with challenge experiences that discriminated between 54 high (more than 50 international caps for team sport athletes/at least five world/Olympic medals for individual athletes), medium (playing at the same league level with less than 5 international caps/no more than one medal at

world/Olympic level) and low (had achieved high levels at the youth level including age group representative honours but had then competed at the second national league level/no senior medals at world level) achievers across sports including football, rugby, athletics, rowing, curling, shooting, skiing, karate, judo and boxing. Firstly, whilst the quantity of challenges experienced throughout development did not differentiate between groups, high performers arrived at challenging experience with a positive and proactive coping and 'learn from it' approach, whilst lower achievers seemed entirely reactive to challenge. In respect to the nature of the challenge, the learning and development associated with high level performers seemed to be associated with sporting challenge; most commonly through injury or deselection at crucial times (Collins et al., 2016).

Moving beyond descriptive accounts of challenge, Savage et al. (2017) explored the impactful challenges in the development of twenty senior international performers from a variety of different sports including archery, football, hockey, and athletics. Similar to the findings of Collins et al. (2016), the most impactful challenges experienced were primarily sport-related (e.g., injury, non-selection, underperformance, settling into a new team) and were associated with an immediately negative but ultimately positive impact. These challenge experiences were negotiated using psycho-behavioural skills that were brought to, rather than generated by, the challenge (Savage et al., 2017).

Given that the deployment of psycho-behavioural skills is a crucial component of negotiating and learning from challenge experience (e.g., Savage et al., 2022), talent systems should provide young athletes with the experiences and individualised support to develop the psycho-behavioural skills required to cope with and learn from the inevitable challenges that they will face along the pathway (Collins & MacNamara, 2012, 2022). Indeed, high potential young athletes have partially attributed their inability to fulfil their potential to their lack of,

59

and inability to deploy, appropriate psycho-behavioural skills during challenging experiences (e.g., Taylor et al., 2022b; Taylor & Collins, 2019).

MacNamara et al. (2010a, 2010b) proposed that aspiring athletes must possess and systematically develop a specific set of skills termed the Psychological Characteristics of Developing Excellence (PCDEs; commitment to excellence, coping with pressure, effective imagery, distraction and focus control, social skills, quality practice, goal setting, realistic performance evaluation, self-awareness, planning and self-organisation, actively seeking social support) if they are to fulfil their potential in sport. These psycho-behavioural skills or PCDEs are clear and observable behaviours, including attitudes, emotions and the commitment developing athletes require in order to reach their potential (Collins and MacNamara, 2022; MacNamara et al., 2010a; 2010b). The development of these PCDEs allows aspiring athletes to optimise development opportunities (e.g., first time appearances at a new level of competition, significant wins and losses) and adapt to challenges (e.g., injury, selection and deselection, demands of increased practice) encountered along the pathway to excellence (MacNamara et al., 2010a, 2010b). PCDEs have been shown both prospectively and retrospectively to be crucial in helping successful youth and senior athletes to progress to, and stay at, their respective performance levels (e.g., Barraclough et al., 2022; Collins & Macnamara, 2017; Kelly et al., 2023; Savage et al., 2022). Moreover, PCDEs have been shown to be effective in driving progress in both performance and participation within the same development environment (cf. Collins & MacNamara, 2017). These PCDEs can be proactively developed through a teach-test-refine-repeat approach, offering young athletes a toolbox with which they have practiced and are confident in using to counter a variety of challenges (MacNamara et al., 2010a, 2010b). Indeed, other and more appropriate skills may be appropriate for specific contexts (Collins et al., 2019).

Whilst the development and deployment of a range of psycho-behavioural skills are an important part of negotiating the challenge experience (Collins & MacNamara, 2022; MacNamara et al., 2010b, 2010a; Williams & MacNamara, 2022), they are just one part of the developing athletes toolkit, and there are a range of factors that influence the nature of, and response to, challenge experience. Recent evidence suggests that the perception of the source of the challenge is just as important for impact as the experience of challenge itself (Taylor et al., 2022a, 2022b). In essence, the challenge experienced by the athlete needs to be seen as coherent and appropriate. In this regard, the individual athlete must be presented with an appropriate level of challenge, one in which they are adequately prepared for, and one that is realistic and appropriate to the needs of the athlete (Taylor et al., 2022b). In the absence of these factors, the challenge is unlikely to be appropriate and is likely to be perceived as incoherent by the athlete. Reflecting on the concepts of integration outlined in 2.4.3, appropriate integration of support can promote an adaptive response to challenge, and a lack of integrated practice and consequent incoherence can add an inappropriate challenge and prevent athletes from making the most of the appropriate challenges that they may face (Taylor et al., 2022b). In this sense, for an athlete to respond adaptively, they need to be able to contextualise their experience, reflect on what happened, apply a psycho-behavioural skillset, and then act in a manner that enhances future performance (Taylor et al., 2022b).

### 2.6.3 Limitations in Current Research

Reflecting general limitations in TD research (cf. Collins et al., 2019), however, research on the role of challenge in the development of high-level sports performers has been dominated by retrospective designs (e.g., Collins et al., 2016; Savage et al., 2017, 2022; Taylor et al., 2022b) and there has been a lack of longitudinal and prospective investigations of the experiences of young athletes selected at early stages of the pathway and the challenges that

they face over time. For example, Collins et al. (2016) retrospectively interviewed current elite athletes or those that had retired within the previous three years to understand the role of challenge in their development. The 'super champs' interviewed in that study had an average career span of 22.5 years at the time of investigation. Similarly, Savage et al. (2017; 2021) retrospectively interviewed currently high-performing elite athletes with an average age of 23-26 years to understand the role of challenge in their development. Taylor et al. (2022b) explored the role of challenge in successful and unsuccessful Rugby players, retrospectively interviewing players with an average age of 22-23 years at the time of investigation.

In addition to these limitations, there has been a lack of inquiry into the challenge experiences specific to football academy players. Of the limited literature that has been specific to football, Swainston et al. (2020) explored the challenge dynamics experienced from the perspectives of youth footballers experiencing the youth-to-senior transition in a professional football club. The pressure experienced waiting for a professional contract decision, and then difficulties associated with the adaptation to senior football including increased physical and mental demands, the pressure to win, a lack of first team opportunities, and social dynamic concerns were reported. Notably, players relied heavily on personal support networks during challenging periods as limited social support was provided by their clubs.

Sothern & O'Gorman (2021) explored the experiences of youth players within a UK professional football academy, with players experiencing a variety of sporting (e.g., being forced to mask/play through injury in fear of losing their position in the academy, fear of judgement from coaches, negative performance feedback from parents, anxiousness over deselection) and non-sporting (e.g., forced to sacrifice their social lives, the underdevelopment of companionships and meaningful friendships) challenges within the academy. In a similar investigation, Hem et al. (2022) retrospectively investigated the challenges experienced by young players recruited into English Premier League academies, with players again reporting

difficulties in managing the pressure of having to perform and prove themselves consistently, the increased tempo and intensity of training and competition, the high level of internal competition between players, and the fear of getting criticised by coaches. Similar investigations framed within football academy contexts have also demonstrated senior transitions, uncertainty over psychological and physical capabilities, underperformance, making mistakes, family stressors, high levels of competition, managing academic stress, and deselection as significant challenges for youth football players (Blakelock et al., 2016; Morris et al., 2015, 2016, 2017; Papastaikoudis et al., 2023; Reeves et al., 2018).

These investigations have contributed to our understanding of the challenges experienced by young academy players, but with cross sectional designs (e.g., entrance into an academy, transition point, before/after selection/deselection procedures, pre-season) and thus, offer limited perspective on the temporal nature of the challenge experience. A prospective exploration of the experiences of young players in the early years of their talent pathway can help to inform the approaches taken by coaches to better utilise challenge and support mechanisms (cf. Williams & MacNamara, 2022). The temporal nature of the challenge experience in the development of young Irish players selected into the TD system will be explored in Chapter 8.


### 2.6.4 Psychological Safety

Psychological Safety is a concept with a long history in the organisational literature (Edmondson, 1999), but has recently begun to gain popularity in the sporting domain (e.g., Jowett et al., 2023; Taylor et al., 2022a). Despite this growth in both applied (e.g., Taylor et al., 2022a) and research (e.g., Jowett et al., 2023) interest, psychological safety lacks a consensus definition in the sporting domain (cf. Taylor et al., 2022a). The lack of consensus definition makes psychological safety difficult to directly measure or quantify. Psychological

safety has been conceptualised as an individual perception where one is protected from, or unlikely to be at risk of, psychological harm in sport (including fear, threat, and insecurity) with shared perceptions of comfort (Vella et al., 2022). Alternatively, other research has utilised the established Edmondson (2019) definition used in organisational research, which refers to the dual effect of a shared belief that people can speak up without interpersonal risk and that making mistakes will not lead to punitive consequences (e.g., Jowett et al., 2023). Most recently, Edmondson (2019) described psychological safety in team settings as a climate in which people are comfortable expressing and being themselves, they can share concerns or make mistakes without fear of embarrassment or retribution, and they are confident to speak up or ask questions without being humiliated, ignored, or blamed.

A consequence of any of these definitions is the doubt that psychological safety is an appropriately transferable concept in the high-performance sport context. To this point, the only empirical investigation in high performance sport was that of Taylor et al. (2022a) in an examination of the extent to which matched groups of international and released professional rugby union players perceived psychological safety to be an adaptive feature of their development. Taylor et al. (2022a) held to a consistent conceptualisation of psychological safety as that originally outlined by Edmondson (1999); referring to the dual effect of a shared belief that people can speak up without interpersonal risk and that making mistakes will not lead to punitive consequences. Across both groups of players, a lack of psychological safety was a constant factor in their professional careers, predominantly driven by the judgement conferred by selection and deselection decisions, but also by peer comparison and intra-group competition. Additionally, the extent to which athletes individually perceived their circumstances to be 'safe' appeared to impact them differentially. However, the ability to cope with and develop in a psychologically unsafe environment appeared critical to the progress and adaptive responses of the successful players. Those players who perceived their developmental

experience to be very safe expressed that such environmental circumstances did not adequately prepare them for the demands of the high-performance milieu. Yet, the pressure conferred by a lack of safety was significantly fatiguing and long-term exposure left players feeling exhausted (cf. Taylor et al., 2022a).

In the context of this thesis, it is worth noting that this data was specifically grounded in the elite adult male rugby union context. Thus, there is a need to investigate these concepts in the TD context to understand how the dynamics of selection impact individuals. Specifically, to this point, there is no evidence that has specifically investigated psychological safety amongst younger participants who have been explicitly identified as being members of TD systems (Taylor et al., 2022a). Indeed, Taylor et al. (2022a) have suggested that there is a need for more research to further understand the conceptual and practical significance of psychological safety in sport. Jowett et al. (2023) have called for the need for longitudinal research specific to the sporting context to address these aims. Using the original and established definition of psychological safety (cf. Edmondson, 1999), the research study in Chapter eight sought to prospectively explore the temporal impact of psychological safety on the development of young Irish players during their first season in the FAI's national TD system.

# Chapter 3: Premature Professionalisation or Early Engagement? Examining Practice in Football Player Pathways.

## 3.1 Introduction

As discussed in Chapter 1, the development of talent in football is a multi-million-euro business and, across nations, significant financial resources are invested in identifying and developing talented young players. For example, some football academies in the UK are now adopting an approach whereby players as young as six are required to attend multiple weekly training sessions, with formal club registration beginning at nine years of age (English Premier League, 2011; Read et al., 2016). This has led to suggestions of "premature professionalization" of youth sport to the detriment of the young players involved. Of the 265 million people that regularly play football, only 0.04% play in a professional league (Haugaasen & Jordet, 2012) and even the best performing young players are unlikely to maintain progression and become elite senior players (Güllich, 2014). As outlined in Chapter 1 and 2, the complexity of talent identification in sport is compounded by the methods used to select young players into professional academies. Typically, young players are identified and then selected based on subjective analysis by coaches on the factors thought to underpin senior performance (e.g., physical, biological or performance determinants (Williams & Reilly, 2000)) without due consideration to the non-linear and dynamic nature of the pathway and the non-stable nature of these factors (Abbott & Collins, 2004). Indeed, the importance of a biopsychosocial approach

to TD has been stressed in Chapter 1 and 2 (e.g., Bailey et al., 2010) and, in this regard, football clubs must consider their role in the biopsychosocial development of players.

Reflecting the first aim of this thesis outlined in section 1.7 of Chapter 1, the purpose of this review was to critically consider the early engagement practices in football and the extent to which, and how, the football pathway can provide players with the most appropriate starting point for their development. Referring to section 1.9, this review is framed within the socio-political context of the Irish-UK football landscape and is specific to male football.

## 3.2 The Socio-Political Realities of Modern Football

In addition to the complexity of predicting talent at a young age, and reflective of the biopsychosocial approach described throughout Chapter 2, the cultural and societal influences within football must be addressed to account for the complex system that young players experience, and the cultural milieu generated by the sport, context, and even gender. Scouts and coaches base their selection on the extent to which a young player possesses the skills and ability to compete in a specific cultural context or philosophy (Sarmento et al., 2018). For example, the Ajax football academy has been characterised by a focus on ball possession with emphasis placed upon a player's technical and tactical skill in all playing positions, as well as their physical capacity to continually move to create space and receive the ball (Larsen et al., 2020). In the Danish underage national context, coaches place less emphasis on technical-tactical skills or physical capacities and greater emphasis on the potential of a player to learn and improve (Christensen, 2009). In some football academy contexts (e.g., Bergkamp et al., 2022; Jokuschies et al., 2017) physiological and motor skills are of high importance for youth coaches, whereas in others (e.g., Larkin & O'Connor, 2017), they are not. These cultural and philosophical contexts are influenced by the short and/or long-term goals of the individual club and the preferences of the coaches (Christensen, 2009; Larsen et al., 2020).

The competitive landscape in football also makes talent identification and selection a strategic and tactical decision (Relvas et al., 2010) and there are certainly systemic drivers that force clubs to select young players. As outlined in Chapter 1, in the previous decade, schoolboy football clubs in Ireland had the most young players sold to professional football clubs abroad in world football (FIFA, 2021). Reflecting these substantial profits and the cost of buying senior players in the competitive marketplace, it makes sense that newly formed professional academies in Ireland under the re-structured player pathway (section 1.2) recruit large numbers of players into their academies from a young age. For example, the player may turn into the next superstar, and for a relatively small outlay, the club will benefit both on (performance) and off (financially) the pitch. Reflecting football's competitive nature, identifying potentially talented players and selecting them at a relatively young age means that they are not available to another rival club. Given the finite coaching resources, money, facilities, and exposure to competition available to all clubs, decisions of who and when to select and deselect on the pathway are inevitable.

However, the socio-political landscape of modern-day football is evolving, and clubs must be systematic, careful, and deliberate in designing player development policies. Understandably, there is growing concern about the influence of academy experiences on young players, especially on those released at various, and often early, points on the pathway (Mitchell et al., 2020; Relvas et al., 2010). Significant academic (Brown & Potrac, 2009) and anecdotal (Calvin, 2017) attention has been paid to the deselection experiences of young footballers, with feelings of anxiety, fear, humiliation, and depression experienced by some young players following deselection. Indeed, some professional football academies have been accused of viewing young players as commodities and performing bodies that are disposed of once it is deemed that they do not have the necessary qualities and attributes to succeed at the senior level (Brown & Potrac, 2009). Against this basis, there have been calls to reconsider the

pathway experience of aspiring footballers and to consider the impact of selection and deselection issues within these environments. As described in Chapter 2, there is a growing literature base that emphasises the influences of biopsychosocial factors on TD with recommendations to delay talent identification (i.e., the age of identification) until later in the pathway, to widening TD opportunities, and exposing young athletes to a range of diverse activities across youth sport (Erikstad et al., 2021; Till & Baker, 2020). As discussed in Chapter 2, it may also be that the distinction between early selection and early specialisation in football academies is less understood, and in reality, the context is more complex than the 'diversification is good, specialisation is bad' argument that is often cited (cf. Baker et al., 2021).

## 3.3 Early Specialisation or Early Focus?

Although early sport specialisation has become a popular research area, a universally agreed definition does not currently exist (Jayanthi et al., 2020; Mosher et al., 2020). Initially, Jayanthi et al. (2013) defined early specialisation as 'year-round intensive training in a single sport at the exclusion of all other sports'. Jayanthi et al. (2015) later introduced an early specialisation scale, whereby an athlete could be deemed low, medium, or highly specialised based upon three criteria. The authors proposed that the degree of specialisation was influenced by whether the athlete a) participated in year-round intensive training (more than eight months per annum), b) selected one main sport, and c) quit all other sports to focus on their main sport. Reflecting inconsistencies in terminology throughout the TD literature (cf. Dohme et al., 2017) a lack of clarity remained, and, in this case, the scale was subsequently questioned because it failed to include all elements that affect an early specialisation pathway, such as training volume and intensity, the type of sport (i.e., individual or team-sport), or the child's autonomy in training (Jayanthi et al., 2020).

Despite the lack of a consensus statement on what constitutes early specialisation (Mosher et al., 2020), and perhaps in response to the structure of competitive youth sport, many researchers and practitioners propose early diversification rather than specialisation as the most appropriate foundation for sporting success (i.e., Bridge & Toms, 2013; DiFiori et al., 2014; LaPrade et al., 2016; Myer et al., 2015, 2016; Read et al., 2016; Wilhelm et al., 2017). The International Olympic Committee published a statement (see Bergeron et al. (2015)) citing generalised concerns associated with youth athletic TD, including an increased risk of overtraining, burnout and injury. The committee recommended an early diversity of athletic exposure between and within sports, despite acknowledging the need for more definitive evidence. Although there is significant research attesting to the benefits of a diversified early engagement in sport (i.e., Côté & Vierimaa, 2014; DiFiori et al., 2014; Jayanthi et al., 2013), much of the suggestions on early specialisation have been guided by research that is retrospective in design and lacking specificity to football (i.e., Fraser-Thomas et al., 2008; Güllich & Emrich, 2006; Law et al., 2007; Moesch et al., 2011; Wall & Côté, 2007). Jayanthi et al. (2020) suggest that the latter point is important, as sport-specific guidelines are needed before strategies for optimal youth participation, injury prevention, and long-term health and performance can be prescribed.

However, developing an evidence-based and sport-specific early specialisation definition is unlikely given the multitude of biopsychosocial influences that impact youth sport participation and performance (Bailey et al., 2010). Firstly, guidelines on early specialisation are likely to differ depending upon the outcome studied (e.g., injury, performance, participation, psychological outcomes, social outcomes) (Jayanthi et al., 2020). Irrespective of these outcomes, it would be difficult to conduct research to produce an 'evidence-informed' definition of early specialisation (cf. Jayanthi et al., 2020) that accounts for all of the biopsychosocial influences that impact upon these outcomes (e.g., child's autonomy in training,

the social milieu, type of sport, training intensity, practice hours in organised sport vs. free play hours, stage of maturation, quality of coaching, psychological impact of different training activities, environmental conditions, culture).

Some research has attempted to address the risks associated with youth participation in high-level football. A systematic review by Jones et al. (2019) concluded that high-level youth players have a high probability of sustaining a time-loss injury and, consequently, lose large portions of their seasonal development. However, no research within the review included a matched comparator group of diversified sports players tracked prospectively to compare training, match, and overall injury incidence rates. In contrast, research by Frome et al. (2019) explored the relationship between specialisation and injury incidence in 2099 academy footballers aged 7-17 using retrospective survey data of lifetime injury incidence, severity and location, as well as sporting participation (i.e., type) and volume. Results suggested that, after accounting for age and weekly training volume, specialised youth footballers were ~20% less likely to experience a previous sports-related injury than non-specialised athletes (Frome et al., 2019). Again, study limitations must be acknowledged; namely that the study was retrospective in design and all data was self-reported by parents/guardians. The paucity and low quality of research to date in this regard was highlighted in a recent systematic review examining the relationship between youth sports specialisation and musculoskeletal injury (Fabricant et al., 2016). When the inclusion criteria (i.e., participants aged 18 years or younger at the time of study, peer-reviewed, published, and original research examining the link between specialisation and injury incidence) and the exclusion criteria (i.e., published papers not written in the English language, studies containing participants recruited from clinical settings) for the systematic review were applied, only three appropriate studies were included, two of which were retrospective and one of which was a case-control study. The authors concluded that the evidence on the relationship between early specialisation and musculoskeletal injury is scarce,

mainly retrospective, and inconclusive (Fabricant et al., 2016). The authors called for the need for more comparative and prospective research to clarify the relationship between youth sports specialisation and musculoskeletal injury (Fabricant et al., 2016).

Although junior success does not necessarily lead to senior success in football (Collins et al., 2016; Taylor & Collins, 2019), there is evidence that early and prolonged engagement in sport-specific activities is necessary for senior performance (Ford et al., 2009; Ford & Williams, 2012; Haugaasen et al., 2014; Roca et al., 2012; Sieghartsleitner et al., 2018; Zibung & Conzelmann, 2013). For example, hours spent in football-specific team practice at an early age is associated with expert levels of achievement in English (Ford et al., 2009; Ford & Williams, 2012; Roca et al., 2012), Swiss (Sieghartsleitner et al., 2018; Zibung & Conzelmann, 2013), and Norwegian (Haugaasen et al., 2014) footballers. Although early diversification can be a pathway to elite performance (Coutinho et al., 2016), a diversified early experience has not been shown to be a significant influence on the attainment of expertise in football (Ford et al., 2009; Ford & Williams, 2012; Ward et al., 2007). In fact, the hours accumulated in football-specific play and practice during childhood and youth is a strong predictor for perceptual-cognitive expertise in football (Roca et al., 2012). Methodological limitations (i.e., retrospective study designs, limited to specific cultural contexts) in this research must be acknowledged, and there is a need for longitudinal and prospective research that examines the microstructure of the different football activities that support development to better inform the design of early experiences in the football pathway (Coutinho et al., 2016; Davids et al., 2017). However, given the socio-political nature of modern-day professional football, and the systemic drivers influencing academy practices mentioned in section 3.2 of this chapter, it is very unlikely that such a prospective, longitudinal, and comparative experimental design could provide meaningful insight into the specialisation versus diversification debate.

## 3.4 Optimising Early Engagement in a Specialised Pathway

Whilst there is a lack of evidence to identify the appropriate time for young athletes to prioritise their chosen sport in an attempt to fulfil their potential (Baker et al., 2021), retrospective research of 159 former Swiss youth national footballers suggests that large quantities of football-specific learning activities from early childhood is required to achieve high later footballing performance levels (Zibung & Conzelmann, 2013). Similarly, in an investigation into the developmental histories of academy and professional footballers in the UK, those players that transitioned to become senior professionals gained early entry into a professional academy, engaged in high volumes of football-specific practice and play activities, and although not specialising exclusively in football as children, they devoted most of their sporting activity to it (Hendry & Hodges, 2018). Indeed, research in other similar contexts suggests that time spent engaging in football-specific activity from an early age is positively associated with senior performance (Ford et al., 2009; Ford & Williams, 2012; Roca et al., 2012; Sieghartsleitner et al., 2018; Haugaasen et al., 2014). An analysis of 328 elite footballers from seven different nations spanning across Europe, Africa, and North and South America identified that elite players started their participation in a football academy at 11 to 12 years of age (Ford et al., 2012). As outlined in section 1.2.2 of Chapter 1, selection into the academies of professional football clubs in an Irish context begins at age 13, with engagement in formal FAI TD programmes beginning at age 10.

As this investment begins and players are selected into more formalised programmes, support must be provided to manage the diverse sporting commitments of the young players. Football academies typically require players to commit to 2-4 days of training/match-play per week during their childhood and adolescent years (Mitchell et al., 2020; Richardson et al., 2004). However, outside of these training/competition days in the academy programme, players could be encouraged to engage in a range of different activities. For some, this might

allow the opportunity to participate in a different sport or activity; for others, it might provide them with the opportunity to play football in a different setting, such as in school or recreationally to meet their psychosocial needs (Bailey et al., 2010). If managed appropriately, there would appear to be ample time to engage in age, stage, and developmentally appropriate activities in addition to the structured academy programme. Of course, as intensity and physical demands increase, training loads should be monitored to maximise athletic development and minimise the risk of overtraining and injury, especially during rapid growth periods (Jones et al., 2019; Materne et al., 2021; Wrigley et al., 2012).

A key aim of the TD process is to provide youth athletes with a suitable learning environment to accelerate or realise their potential (Till & Baker, 2020). Güllich et al. (2017) and Güllich (2019) reported that higher amounts of football-specific free play and structured practice in other sports during childhood, rather than larger quantities of coach-led football practice, differentiated German players at the highest professional standard. However, both studies' findings are restricted by methodological limitations, including retrospective recall bias, cultural limitations, and neither study recorded the 'quality' of practice and free play. Contrastingly, a plethora of research (with similar retrospective recall bias limitations) exists to suggest that large amounts of football-specific practice and unstructured free play during childhood contributes to the development of expert football-specific performance (Ford et al., 2009, 2012; Sieghartsleitner et al., 2018; Zibung & Conzelmann, 2013). Therefore, this suggests that a developmental pathway should be structured to provide large amounts of football-specific learning activities, but delivered in a broad, diverse, and developmentally appropriate format (Sieghartsleitner et al., 2018). This may include, as examples, coach-led and peer-led practices, peer-led and self-led unstructured free-play, and skill development.

## 3.5 The Dynamic and Non-Linear Pathway Experience

Notwithstanding the points raised throughout this chapter, it is also crucial to recognise how changes in broader society and talent pathways influence the developmental activities of young players. Research exploring the developmental histories of elite and non-elite athletes (e.g., (Baker et al., 2003; Côté, et al., 2005; Gulbin et al., 2010), as well as more observational descriptions of free-play, diversification and development (as evidenced in the development of elite Brazilian footballers; Ford et al., 2012), is purported to offer clues to best practice, generating 'evidence-based' practices which can be adopted and applied. In football, for example, this may be the provision of structures and experiences that allow high potential players to experience sufficient football practice *and* developmentally appropriate activities *and* unstructured free play within their developmental pathway. Although, as a result of social changes in western societies, children are not engaging in the same volume of outdoor free-play than previous generations (Solomon-Moore et al., 2018). However, in sports like football where there is less evidence of the discriminatory power of broader activity (Haugaasen et al., 2014), early selection into an academy setting may not have negative consequences so long as high potential players are engaged in a broad programme of activities (e.g., peer-led free play, coach-led practice and competition, varied team sizes and match durations, modified pitch sizes and training environments); a focus on early engagement rather than early specialisation. It is also important to appreciate the biopsychosocial nature of TD (Bailey et al., 2010) and that 'optimal solutions' in this regard will go beyond the quality of play and practice or the age at which specialisation takes place alone, and instead, will be contextualised based upon the interaction of the biopsychosocial elements as described throughout Chapter 1 and 2 (cf. Collins et al., 2019). The onus is on sport organisations to critically evaluate the worth and validity of a particular approach (e.g., diversification, specialisation, or early engagement) to provide the most appropriate development experiences in particular contexts.

The TD process is non-linear (Collins & MacNamara, 2012) and the complex transition, and low conversion rates, from youth to professional football (Güllich, 2014; Larsen et al., 2014) could be cited as an argument against early selection. As discussed in Chapter 2, players should be able to transition in and out of the pathway across multiple time points as they progress, although the reality appears to be more complex, and the number of athletes reaching elite levels is constrained by the numbers of professional players a system can maintain. Simply, deselection from football academies is inevitable for the vast majority of players, and if poorly managed, it can have negative emotional and psychological impacts on young players over the long term (Brown & Potrac, 2009). As an example, literature has reported former youth athletes questioning their identity and the role of sport in their lives following deselection (Mitchell et al., 2021; Neely et al., 2018). Released football academy players have also reported receiving no support for their well-being from their clubs following deselection (McGlinchey et al., 2022). Football clubs have a moral and ethical responsibility to focus on the welfare of all players under their care, whether they are selected to progress further or deselected. Whilst there are no recommendations as to what constitutes an 'appropriate' length of aftercare following deselection, Crystal Palace Football Club were the first professional club to publicly announce their three-year aftercare programme for released academy players aged 18-23 to help players find new clubs, educational opportunities, or employment following their release from the academy (Crystal Palace Football Club, 2022). This presents a progressive step forward for supporting players post deselection (cf. McGlinchey et al., 2022).

Yet, it is also important to highlight that evidence considering longer term outcomes for young players also points to a more positive picture (Rongen et al., 2020). For example, players from one English Premier League academy have consistently reported experiencing good health-related quality of life in terms of physical well-being, psychological well-being, parent and peer relationships, self-autonomy, and in their school environment (Rongan et al.,

2020). Williams & MacNamara (2020) also found that high-potential young athletes who were deselected reported that the experience of the talent pathway provided the foundations for future success in other sports, careers, or education opportunities. Talent systems can provide an environment that develops valuable constructs, (e.g., professionalism and positive performance behaviours), psycho-behavioural skills (e.g., social awareness and effective communication), and personal responsibility (e.g., self-motivation and personal drive/desire) which can crossover to alternative domains outside of sport and prove advantageous (Williams & MacNamara, 2020). Similarly, Neely et al. (2018) identified that deselection from the talent pathway can be accompanied by subsequent personal growth experiences. The authors noted that, despite not progressing, deselected athletes experienced an enhanced sense of personal strength, developed closer social relationships, and recognised new and alternative opportunities. Therefore, it is possible that if structured appropriately, players can have many positive experiences during their time in football academies leading to the development of multiple skills and behaviours that are transferable to many other parts of their lives (Williams & MacNamara, 2020).

## 3.6 Conclusion

It is unlikely that football clubs throughout Europe will cease to select players at a young age, and in fact, the research suggests that early specialisation issues may be less influential in sports like football which requires higher skill and variability than in athletics, for example (Paul et al., 2016). Given the evidence presented in this chapter, early selection into an academy setting may not have detrimental consequences, so long as high potential players are engaged in a broad range of quality sporting experiences. Specifically, the focus should be on the quality of the experience offered to high potential young players to support their development both on and off the pitch (Williams & MacNamara, 2020). Despite the non-linear nature of TD, there

is also a lack of research investigating those who do not make it to the highest level, perhaps leading to survivorship bias within the literature (Taylor & Collins, 2019). The need for more research is evident, and issues of biological, neurological, and social readiness have rarely been considered (Baker et al., 2021). We must consider the viewpoints of the coaches, and critically, the high potential young athletes themselves regarding developmental strategies, since their voices have been largely absent from the discussion to date (Baker et al., 2021). Chapter 8 will seek to address these limitations.

# Chapter 4: The Irish Football Player Pathway: Examining Stakeholder Coherence Throughout and Across the Player Development System.

## 4.1 Introduction

Chapter 3 addressed a notable gap in the literature by critically evaluating the research underpinning the early engagement practices of professional football clubs and by providing suggestions on how the football pathway can provide the most appropriate starting point for player development. As discussed in Chapter 2, this pathway experience for young players appears to be enhanced when the key stakeholders across their pathway have similar perceptions of the key elements of talent identification and development, and therefore, similar behaviours and support systems (Curran et al., 2021, 2022; Martindale et al., 2005, 2007; Mills et al., 2014a; Pankhurst et al., 2013; Pankhurst & Collins, 2013; Taylor & Collins, 2021; Webb et al., 2016). As described in section 2.4.3, coherence can be seen horizontally, where stakeholders across a pathway stage (e.g., parents, coaches) work with players in an agreed fashion to optimise their experience, and stakeholder coherence can also be seen vertically, where multiple stages of the pathway (e.g., local grassroots club, professional academy, youth international team) are coordinated and build chronologically from previous involvement toward long-term needs (Taylor & Collins, 2021).

However, the evidence from the extant literature in football pathways has suggested that such coherence often does not exist in applied practice (Clarke & Harwood, 2014; Harwood et al., 2010; Ivarsson et al., 2015; Mills et al., 2014b; Relvas et al., 2010). Indeed, the TD process is complex, dynamic, and non-linear with a range of variables influencing the development of the athlete (e.g., Abbott et al., 2005; Abbott & Collins, 2004), but a coherent pathway appears to be one key systemic element that can help to support this process (Bjørndal et al., 2018; Curran et al., 2021; Martindale et al., 2005, 2007). As discussed in Chapter 2, it is, therefore, a key strategic priority of any Football Association to establish a coherent pathway for young players.

As discussed in Chapter 2, the TD milieu is complex, with multiple stakeholders impacting the development of the athlete both within and across environments (e.g., local clubs, regional talent squads, national representative squads, schools) (Bjørndal & Ronglan, 2018). Whilst there are many different stakeholders that inhabit these environments (e.g., scouts, academy managers, teachers, peers) (Bjørndal et al., 2017; Bjørndal & Ronglan, 2018), the NGB, coaches, and parents represent three key stakeholders within this TD process (Pankhurst & Collins, 2013), with each having different roles and supporting the development of the athlete in different ways. These differing support structures were discussed in section 2.4. Yet, whilst the knowledge, skills, and abilities of each stakeholder are unique and specific to the individual athlete, there is a need for consistency and clarity in messages and support between the stakeholders if the potential of a player is to be realised (Martindale et al., 2005; Pankhurst et al., 2013). In most talent identification and development systems, stakeholder understanding of the fundamentals of the key constructs of any process is presumed to exist, although research thus far does not appear to support this presumption (Curran et al., 2022; Pankhurst et al., 2013).

As outlined in Chapter 1, however, there is a lack of empirical evidence about how coherence can be realised in regard to the methods, structures, and opportunities that young athletes are afforded as they progress within a complex talent pathway. As a result, there have been calls for further research to provide clarity in this area (cf. Pankhurst et al., 2013; Pankhurst & Collins, 2013; Webb et al., 2016). Indeed, there is a growing research base that has sought to examine TDEs in a youth football context (i.e., Aalberg & Sæther, 2016; Flatgård et al., 2020; Larsen et al., 2013, 2020). However, despite providing valuable additions to the TD literature, these investigations have predominantly focused on a single football club or age group. Furthermore, and reflecting the importance of contextual research (cf. Chapter 1), no research has been conducted in this regard in an Irish context. Whilst similarities in TDEs can exist at their core, development environments are highly individualised and culturally specific (Henriksen et al., 2010a, 2010b; Mills et al., 2014a).

Given the importance of a vertically and horizontally coherent pathway as addressed in Chapter 1 and 2, and in line with the second aim of this thesis outlined in section 1.7, this study aimed to examine the extent of horizontal and vertical coherence across the Irish football pathway and to explore the key stakeholder perceptions of, and alignment to, TD principles. The key TD principles explored in this study were those consistently identified in the extant literature: importance of experiencing appropriate and individualised levels of challenge (e.g., Collins & MacNamara, 2012, 2022; Taylor & Collins, 2019), establishing long-term aims and methods in TD systems (Martindale et al., 2007), emphasising long-term development over short-term success (Martindale et al., 2007), providing wide ranging and coherent messaging and support for athletes (Martindale et al., 2007), and establishing coherence and integration within and across talent systems (Henriksen et al., 2010a, 2010b; Taylor & Collins, 2021; Webb et al., 2016). Given the lack of previous research investigating how the introduction of the new Irish football academy system impacts each stakeholder (Chapter 1, section 1.2), the

nature of this research was considered timely. As Mills et al. (2014a, p. 138) note, "[our] knowledge of athletic development environments is far from complete, particularly where elite youth soccer is concerned". To bridge this gap, qualitative interviews were conducted with parents and coaches from across the pathway, as well as with members of the FAI as the NGB. This was the first research of its kind to critically analyse the extent of stakeholder coherence across the Irish football player pathway, and consequently, this research was considered necessary to optimise future player development and coach development policies within the FAI.

## 4.2 Methodology

### 4.2.1 The Context

As described in section 1.2 in Chapter 1, the FAI is the NGB for football in Ireland, and between 2015-2019, introduced significant changes to how the pathway for young players was structured under the Player Development Plan. Referring to section 1.2.2 in Chapter 1, a primary component of this plan was the introduction of the underage NL, which, for the first time, required professional League of Ireland clubs to create affiliated academy squads from the under 14 to under 19 age cohorts, like the academy system seen in professional clubs elsewhere throughout Europe. This decision was a radical intervention in player development in Ireland and caused significant unrest among the SFAI and many of its member clubs. At the time of this investigation, there were 25 underage NL clubs, with an approximate total of 400 players operating at each age group. As outlined in section 1.2.1 of Chapter 1, the SFAI, an affiliate of the FAI, had been the governing body for underage youth football up to the under 16 age groups in Ireland since 1934, with full jurisdiction over all affiliated leagues and their respective clubs, players, and coaches. The age groups under the jurisdiction of the SFAI range

from the under 7 (can vary across leagues and clubs) to under 16 age groups. Although an affiliate of the FAI, the SFAI governs and operates independently to the FAI.

As outlined in section 1.2, the FAI have also implemented the Emerging Talent Programme to assist in the development of players nationwide, which consists of development structures (e.g., coaching, assessment, training, competition) at league (30 SFAI schoolboy leagues), regional (10 regions) and national (1 National Academy) level. The Emerging Talent Programme at the league level caters for players at the under 11-14 age groups, caters for players at the regional/centre of excellence level for players at the under 12-13 age groups, and for players at the national level at the under 13 and 14 age groups. As stated in section 1.2 in Chapter 1, the Emerging Talent Programme selects players from schoolboy football clubs, although these programmes are under direct control of the FAI, not the SFAI.

**4.2.2 Research Philosophy**

Given my philosophical positioning outlined in Section 1.6 of Chapter 1, this study was grounded by a pragmatic research philosophy (Giacobbi et al., 2005). Pragmatism maintains that researchers are not passive observers, and as such, it was important that I had experience working within the talent pathway in the context under investigation (Chapter 1, section 1.5). My positioning as a practitioner familiar with this context facilitated novel and innovative insights (Bryant, 2009) and formed the platform for a detailed enquiry, allowing for the combination of my applied experience with relevant literature to generate practically meaningful information. Reflecting my pragmatic approach and the aim of this research, a qualitative methodological approach in the form of one-to-one interviews was deemed most appropriate to facilitate an in-depth investigation of the perceptions and experiences of the pathway from the perspectives of each stakeholder.

### 4.2.3 Participants

31 participants were purposefully recruited based on their current involvement in the Irish football pathway. Participants were subdivided into separate samples of parents [P] ($n = 9$) aged between 44 and 53 years (M = 49.4 years; SD = 3.0 years), Schoolboy football club coaches [SC] ($n = 8$) aged between 33 and 58 years (M = 43.4 years; SD = 7.3 years), NL academy coaches [NLC] ($n = 10$) aged between 23 and 53 years (M = 35.8 years, SD = 9.3 years), and coaching/coordinating personnel from the FAI underage national coaching system [FAIC] ($n = 4$) aged between 30 and 65 years (M = 42.3 years; SD = 16.5). The participant recruitment process will be outlined in the forthcoming paragraph.

Following ethical approval by the Dublin City University Research Ethics Committee, the League of Ireland (underage NL) academy manager was asked to shortlist NL coaches based upon the following criteria: a) currently coaching in the underage NL with at least one year's experience in their current role; b) geographically distributed with a maximum of one coach per club; and c) coaching across the age groups investigated (U14-17) with a minimum of two coaches per age group. The FAI National Coaching Coordinator was asked to shortlist national level coaches based upon the following criteria: a) currently coaching at the national level with at least one year's experience in the current role; b) geographically distributed with one coach per region; and c) coaching across the age groups investigated. The League of Ireland academy manager and the FAI National Coaching Coordinator, respectively, were asked to contact the potential coaches and provide them with information about this investigation and to ask for their consent to be contacted by me. Those coaches from both cohorts who agreed to be contacted informed the FAI National Coaching Coordinator and the League of Ireland academy manager, respectively, who subsequently informed me and provided me with the contact details of the individual coaches. I subsequently contacted coaches from both cohorts who had agreed. This contact took the form of emails, and telephone where necessary, in which

participants were informed of the purpose of the investigation and assured of confidentiality. All participants were provided with a participant information document before providing informed consent.

After participation, NL coaches were then asked to contact all parents within their respective age groups to provide them with the participant information leaflet outlining the study, which contained my contact details. Those parents that were interested in taking part were asked to contact me to inform me of their interest in participating. Following this initial contact, parents were provided with further information related to the study via email, and by telephone where necessary, and were assured of confidentiality. After agreeing to participate, all parents provided informed consent.

After participation, NL coaches were also asked to nominate one coach currently coaching at a schoolboy football club within their region to take part in this study. NL coaches were asked to nominate a schoolboy football coach based upon the following criteria: a) currently coaching at a schoolboy football club with at least one year's experience in their current role; b) located within their geographical region; and c) coaching across the age groups investigated (U14-17). After nomination, NL coaches were asked to contact this coach and provide them with information about this investigation and to ask for their consent to be contacted by myself. All schoolboy coaches who were contacted agreed to be contacted and were subsequently informed further about the study by email or telephone where necessary and assured of confidentiality. All schoolboy coaches were provided with a participant information document before providing informed consent.

Thus, all participants were recruited from an evenly distributed geographical sample which provided a nationally representative spread of participants across the country. Moreover, the spread of coaches provided a representation of all levels of Irish underage football, from schoolboy level through to the national level, with each coach deriving from a different club.

Given the introduction of the new underage NL and academy infrastructure in Irish football under the FAI's Player Development Plan in 2015, each participant's engagement in the pathway under the current system ranged from 1-5 years at the time of data collection.

**4.2.4 Data Collection**

To maintain relevance to the research questions, a semi-structured interview guide with open-ended questions and relevant follow-up prompts was reflexively adhered to. The interview guide was underpinned by relevant literature and my knowledge and experiences of Irish football and TDEs. This interview guide is available in Appendix C. Questions revolved around various experiences and perceptions of the Irish football pathway (e.g., What is your understanding of the FAI player pathway? What are the objectives of the underage National Leagues? What are the coaches from the National League clubs looking for in players during talent identification?), with probes and prompts used to clarify and expand on specific points (e.g., Are these the right things in your opinion? How does that influence what you do in your role?). The interview guide was tested and refined through pilot work with three Irish football coaches aged between 38 and 55 years (M = 44.3 years; SD = 9.3), all of which were qualified at a minimum of the UEFA A coaching Licence, with between 4 and 25 years of coaching experience (M = 9.3 years; SD = 10.5 years).

Interviews were conducted between each participant and me. Interviews were conducted electronically via video interviews using the Zoom video software (Zoom Video Communications, San Jose, California, USA) to ensure adherence to the national government's Covid-19 pandemic safety regulations at the time of data collection. In instances where face-to-face interviews are unfeasible, Zoom electronic video interviews are recommended as an alternative method to gather rich data, whilst facilitating an appropriate participant experience (Gray et al., 2020). Interviews were conducted with each participant in a quiet (online) location,

and a pre-briefing allowed participants to reflect upon the themes to be discussed and provided an opportunity for further questions. Excluding an initial briefing and warm-up questions, interviews lasted between 43 and 81 minutes (M = 60 minutes; SD = 10 minutes) and were video and audio recorded for subsequent transcription and analysis. I manually transcribed the interviews, with transcription documents then re-checked against audio recordings to confirm transcription accuracy.

### 4.2.5 Data Analysis

RTA (Braun & Clarke, 2019, 2021, 2022) was conducted to analyse the content of the interviews. The process of RTA involves a 'researcher's reflective and thoughtful engagement with their data and their reflective and thoughtful engagement with the analytic process' (Braun & Clarke, 2019, p. 594). Given the nature of RTA (cf. Braun & Clarke, 2019, 2021), interviews were conducted with flexibility and fluidity to resemble the flow of a real-world conversation, with considerable scope to be spontaneously responsive to the participants' unfolding accounts. Such an approach allowed me to gain an in-depth exploration of each participant's story, rather than a uniformly structured account. This flexible and fluid approach to interviewing was considered appropriate for extracting each participant's perceptions, beliefs, and experiences of the Irish football pathway.

Data was analysed using Braun & Clarke's (2019, 2021) six-phased approach to RTA. As a first phase in analysis, data was manually and orthographically transcribed to Microsoft Word (Windows Microsoft, Washington, USA). This was followed by the reading and re-reading of transcripts, taking of familiarisation notes, and the annotation of manuscripts to ensure familiarity with the data. In phase two, systematic open coding of data took place. This process was undertaken to produce short, succinct but descriptive and informative data that may be relevant to the research investigation (e.g., "National League clubs just want to make

money", "The purpose of the National Leagues is to produce players to play for Ireland").

Indeed, given the reflexive nature of RTA, with regular review of the manuscripts and dataset, codes were continually revised and updated. Using an inductive 'bottom-up' approach, data was open-coded with a focus on deriving semantic and latent codes and themes strongly linked to the data itself. However, deductive analysis was also employed to ensure that open coding produced themes relevant to the research question.

Once relevant data items were coded, initial themes were generated according to the shared meaning across codes (e.g., multiple codes that shared a similar underlying concept were generated into an initial theme). At this phase, distinctive themes were generated from the codes (e.g., 'lack of facilities', 'lack of finance'). Some of the themes generated at this stage were contradictory (e.g., 'The quality of coaching at the schoolboy level is poor', 'Coaching at the schoolboy level and National League level is the same'). Upon review, these initial themes (e.g., 'Lack of facilities', 'Lack of finance') were developed and structured into a framework of sub-themes (e.g., 'lack of appropriate resources in the National Leagues') and themes ('Systematic barriers to player development'). As a method of furthering the trustworthiness of the analysis conducted, at this phase, the primary supervisor audited the reflexive analytical process by sense-checking analysis and challenging the generation of themes and sub-themes. This sense-checking and 'critical friend-like' approach to the generation of themes and sub-themes encouraged and deepened reflexivity by providing possible alternative interpretations of data in a way that was collaborative and flexible, thus achieving richer interpretations of meaning (Braun & Clarke, 2019, 2021).

In phase four, potential themes were reviewed in relation to the coded data items and the entire dataset. In this phase, some initial themes required revision and were renamed (for example, 'Cultural factors' was deemed too vague given the context of the investigation and was subsequently changed to 'Irish culture'). This phase was undertaken via two processes: the

review of the relationships between the codes within each sub-theme, theme, and overarching theme, and secondly, the review of the hierarchy of themes in relation to how well they represented the interpretation of the data within the consideration to the aims of the research study.

Phase five involved the defining and naming of themes. At this phase, each individual theme was reviewed to ensure that each related sub-theme was relevant to the dataset. As part of this process, the final naming of sub-themes and themes was finalised. It was also at this phase where the potential quotes that were to be used within the write up of the study were shortlisted.

The final phase of analysis was the writing of the study. At this phase, I decided in what order the themes would be reported to best illustrate the findings. Following this decision, the results section was written. However, given the reflexive nature of RTA (Braun & Clarke, 2019, 2021), report writing was recursive and woven into the entire process of the analysis. Indeed, sections of the publication manuscript (i.e., introduction) were written prior to analysis. The qualitative analysis software (QSR NVIVO-12) was used to assist in the structuring, organising and analysis of raw data into their thematic hierarchies.

### 4.2.6 Trustworthiness

I was experienced in the Irish football environment at NL level which brought familiarity and awareness with participants on the topics being discussed throughout each interview (Chapter 1, section 1.5). These factors helped build trust and rapport with participants which supported the breadth and depth of information provided. Throughout data analysis, I kept a reflexive journal to record my reflections and insights throughout data collection, and to use the practice of writing as a tool for deepening reflexivity (Braun & Clarke, 2019, 2021). The sense checking of analysis via the critical friend approach by the primary supervisor enhanced the analytical

process and challenged my interpretation of data, stimulating further reflection and insight (Braun & Clarke, 2019; Byrne, 2022).

## 4.3 Results and Discussion

This study aimed to examine the extent of horizontal and vertical stakeholder coherence across the Irish football pathway and to explore the key stakeholder perceptions of, and alignment to, TD principles. The RTA produced two overarching themes (Stakeholder Coherence and Alignment to Talent Development Principles), which are displayed in Table 4.1 alongside their associated themes and sub-themes. Whilst the quantitative nature of the information presented in Table 4.1 is somewhat uncommon for RTA studies, the 'mentioned by participants' section is provided to show where stakeholders agreed and disagreed in their perceptions and experiences of specific elements of the pathway. This addition was deemed appropriate to demonstrate to the reader the extent to which a lack of horizontal and vertical coherence existed between stakeholders and is not intended to display any differing importance or value of the findings. The themes and sub-themes from this study are subsequently presented in detail with exemplar quotations below to illustrate the analysis.

### 4.3.1 Stakeholder Coherence

#### *4.3.1.1 Horizontal Coherence*

A lack of horizontal coherence was apparent at the NL level, as evidenced in the relationships between coaches and parents. Eight NL coaches cited experiences of interference from parents, specifically parents applying excessive amounts of pressure on their children and parents providing contradictory and inappropriate coaching advice. Most coaches cited overbearing

parents as one of the biggest barriers faced at the internal club level, and explained how these parents hinder their ability to perform their role as coaches effectively:

> The first year was tough. I had parents who were quite opinionated, who were vocal on the side-line, who would completely contradict the information that the players were getting from us in their eight hours in training. We spend eight hours a week or five hours with the kids, and we would be telling them this and then the parents would completely change that and then the player becomes quite conflicted in what to do. [NLC6]

> I've seen it with young lads, and nobody is perfect, and we all have bad days and sessions and things like that, but to see a kid get into a car with a parent and the parent tears strips off of the child because they missed a pass or missed a goal or something like that, that's where you as a coach have to be going to the parent and saying 'that's not your job, its mine. I'll talk to him' (…) some kids are afraid for their life! [NLC3]

Côté (1999) highlighted the important role of parents during athlete development through the provision of emotional support as their child experiences the psychological stress and challenges of high-level competition. The results here indicate that a proportion of parents are behaving in ways that can negatively influence long-term development (e.g., providing inappropriate coaching advice, putting pressure on their child). Similar behaviours have also been observed in the parents of English academy players (cf. Mills et al., 2012) and highlight the need for further and more comprehensive parental education; another theme that emerged from this research. Six participants commented on the need for more parental education to help parents understand their influence, but also to help parents understand the roles of the coaches and other key stakeholders. This need for parental education was exemplified by the reflections of P1:

I also think parent education [is needed], because people think that shouting on the side-lines at their son or at the referee…let me tell you, I was guilty of it and I am horrified by it, the kids feed off of that. If you're going to bring kids through football and it's about the journey, parents are inextricably linked to the child. The kid gets brought every day, and the chances are that it's the father in my experience, but the fathers are the worst, they are the absolute pits of it, and there has to be an educational piece for them to understand because they're the ones on the side-lines dictating.

The need for parental education was reciprocated among NL coaches:

I think more can be done with parents to help them understand it. I find that there is a lot of, well maybe not a lot, but there are parents that want the success now. If their children aren't being looked at for Irish assessments, or if their children aren't starting every game, or if the child is coming off after 30 minutes in every game, the parents seem to want answers. [NLC4]

Indeed, the need for parental education and regular coach-parent communication within football academies has been suggested elsewhere (Clarke & Harwood, 2014; Harwood et al., 2010; Newport et al., 2021). Although NL coaches in this study claimed that they do have open and regular lines of communication with parents, most parents were critical of coach communication and believed the level of communication from coaches to be insufficient. This has also been observed in the parents of academy players in the UK, where parents felt that they received inadequate communication and were underappreciated in their role as parents by coaches (Clarke & Harwood, 2014; Harwood et al., 2010). Mirroring these findings, parents in this study expressed a desire for more regular and comprehensive communication from coaches, as P8 explained:

There is a certain vacuum around communication with the club…they're not great, their engagement isn't great with the parents if I'm being honest. They give you the bare minimum and they expect a lot with the kids to be there three days a week for two hours and they work them really hard. You're travelling every weekend. They could manage the parent piece better.

Ten participants also raised concerns over the youth to senior transition in the NL. Specifically, participants expressed how they believed there to be a divide between the senior hierarchy and underage teams within NL clubs, with clubs viewing their underage teams as an inconvenience rather than in a positive developmental light, as NLC1 explained:

What I would say is that certain [NL] clubs do not take it serious and probably only have underage teams to make sure they get their licence, and that would be a massive criticism of some clubs; that you know when you're going to play them that they're not really bothered about how their under 14s or 15s get on, it's just something they have to do to tick a box to make sure they get a licence. And there would definitely be some clubs that if you offered them or said to them 'you don't need a 14s, 15s, or 17s and you'll still get your licence', I'd say they'd get rid of them in a heartbeat.

A lack of coherence between youth academies and senior departments within professional football clubs is not uncommon and is purported to hinder players' youth to senior transition (Relvas et al., 2010). Participants also raised concerns over how the current alignment of age structures within the NL prevented an appropriately staged increase in challenge for young players and was too big of a jump for many. In response, participants expressed the need for an intervention to bridge the gap between youth and senior football at the exit phase of the pathway:

The only other issue I would have is at the top end of the pathway at the under 19s with keeping the players a wee bit longer. Most clubs do not have a reserve team or a league they can put them into so there is no point in us having everything brilliant at the bottom of the pathway if it gets to the end and it's bottlenecked. [NLC10]

For me, rather than letting players go at 19 years of age and bringing them back and signing them at 21, 22, 23 years of age, why can't we have that under 21s and… should we be bridging that gap there? That's my own thoughts on it. [NLC8]

### 4.3.1.2 Vertical Coherence

All participants reported how a disjointed and fractious relationship existed between NL clubs and schoolboy football clubs. Specifically, twenty-nine participants explained how this fractious relationship was the most fragmented element of the player pathway and was subsequently hindering long-term player development. Typifying this, NLC10 commented:

There is no relationship between the schoolboy's football and the League of Ireland clubs up here, it's non-existent. It makes our job more complicated every year. It's more work for me and my coaches, and more work for the schoolboys as well, but who loses out? It's the players.

The disjointed and incoherent relationship between schoolboy clubs and NL clubs was considered to be hindering player development by all schoolboy coaches, as exemplified by SC8, who expressed the need for urgent intervention:

I could go on and on about it, but it needs someone to go in and grab it by the scruff of the neck, and it would need to be a high profiled guy that has a bit of common sense and has a love of the grassroots and has an interest in the League of Ireland and has an

interest in seeing the elite players progress and to have a proper pathway. At the moment, it is a bit disjointed.

Most parents and FAI coaches reiterated that this divide in the pathway was negatively impacting long-term player development. Mills et al. (2014a) emphasised the need to develop positive working relationships with both internal *and* external stakeholders. These findings indicate that NL academies have not established strong cohesive relationships with the schoolboy clubs. This disjointed pathway was epitomised by the reluctance of schoolboy clubs to allow their players to transfer to NL academies, despite this being the natural vertical progression. Nine NL coaches expressed frustrations over how schoolboy clubs were being intentionally uncooperative in the transfer of players and were actively discouraging players from joining NL academies. Typifying this, NLC3 explained:

I won't mention the clubs, but even we have a lot of trouble with a certain club in [Location]. They discourage their players from going and playing National League! Because all they want to do is win a youth cup or a national cup and they want to have it on their role of honour that they won that. But in my mind, they're holding back young lads! (…) I just think some clubs, the way they go on and discourage it [the NL], it's not good for young lads, it's not good for the kids.

The reluctance of schoolboy football clubs to allow players to progress into NL academies was also cited as an issue for parents:

I think what everybody knows, and from my perspective as a parent, my experience of moving from the schoolboys to the League of Ireland was not nice. There was an absolute clash between the junior [schoolboy] club and the League of Ireland club. They were at loggerheads and couldn't agree. [P1]

There's resistance, and anecdotally I can tell you that there is this idea that there are people in [schoolboy] clubs who are being very awkward. For example, a certain schoolboy club refused to transfer players by the June 1st deadline just to be awkward. The lads were then effectively on gardening leave, and they couldn't play for their League of Ireland club because the schoolboy club didn't sign the forms because they weren't legally obliged to do so. That kind of sh*thousery is kind of rife. [P9]

Contrastingly, eight participants, including two NL coaches, explained how NL clubs often contact and attempt to sign players from schoolboy clubs without communicating or seeking approval from the schoolboy clubs first. Similar accusations have historically been made between schoolboy clubs before the NL began. However, this approach by NL clubs was perceived to heighten the conflict between the two entities, as illustrated by SC1:

I've had League of Ireland clubs contact parents directly behind my back while the players have been signed to my club. I've had RDO's [Regional Development Officer's] go directly to players (…) I know there have been other trials in other counties where [NL] clubs have not been honest with me, and I still wished those players the best of luck when they left because there's no point in falling out with them because life's too short, but I didn't help that club next time they came asking.

Under pathway structures at the time of investigation, many schoolboy football league seasons, such as the DDSL, ran from September to May, whereas the NL seasons ran from March to November, with both seasons having conflicting registration periods. As outlined in Chapter 2, Taylor & Collins (2021, p. 317) define vertical integration as 'the extent to which working practices are coordinated through the different stages of an organisation or pathway'. Epitomising a lack of vertical integration (cf. Taylor & Collins, 2021), schoolboy and NL seasons were previously aligned (March-November), but in 2019, several schoolboy leagues

reverted to the September to May season. This season misalignment was suggested as a barrier to player development by six participants and meant that schoolboy clubs were subject to losing numerous players once the NL seasons begin, resulting in uncertainty over playing squads and likely heightening the reluctance of schoolboy clubs to let players transfer to NL club's mid-season. Such frustrations were epitomised by the reflections of SC4:

> One of the big things is that we need to get alignment between schoolboy football and National League football seasons because at the moment it is sort of farcical. I look at my age group at under 14, we will start off the season great, we will have 14 teams in the league, we get to December or January and the likelihood is we will lose several teams and there will be a big gap of players because other League of Ireland clubs will take players from the DDSL.

The SFAI under 14 Kennedy Cup, an interleague competition for the 30 schoolboy leagues in Ireland, has traditionally been seen as a shop window for the best players from the 30 schoolboy leagues in Ireland to attract the interest of professional clubs in the UK. The introduction of the NL at under 13/14 meant that many of the highest potential players in the country at that age were playing for NL clubs and were no longer available to play for their schoolboy leagues in the Kennedy Cup. Participants expressed a belief that this loss of control and the transfer of power to the NL clubs has caused feelings of envy and jealousy amongst many schoolboy clubs who traditionally would have held control over player development in Ireland. This is exemplified by the reflections of NLC6:

> Historically, the schoolboy clubs in Dublin would have produced the players and they still feel aggrieved that they got it taken off them overnight. They feel that they can produce players and they do have a history of producing players. (…) So, I think that's it, it's a loss of control and a loss of power.

This divide between schoolboy and academy football was perceived to be caused by the poor historical relationship between the FAI and SFAI. This poor relationship was characterised by a lack of cooperation and communication, with an unwillingness to establish positive working relationships:

> I think the old sort of analogy of you've got so many kings, and no one wants to lose control of their own palace or their own castle or whatever. I'm assuming, well I'm sure that there's a lot of historical issues there. I think there may potentially be some issues between the SFAI and the FAI which is obviously not allowing them to sit down and come together to create what the best solution is for player development in this country. So, I think you've got a massive issue there. [FAIC3]

A lack of coherence was also apparent in the disparity of participants' understanding of the purpose of the NL. Parents explained how they felt that NL clubs were focusing on player development, but this focus was based on producing as many players as possible to be sold to foreign clubs to generate finances, rather than for the wider benefit of Irish football, as P3 explained:

> The progressive Irish clubs will be looking for players with skill, but I fear it might be just to make a killing on the player. I think they're thinking that if a player comes good, they could take in loads of them and even those who aren't good and they can coach them, and then get them flogged off to an English club and make money. I think a lot of it is down to money.

Most schoolboy coaches agreed, expressing a belief that the reason for the implementation of the NL was economically driven, as SC5 explains:

My opinion on it [the NL] a couple of years ago hasn't changed from what it is now; I think it was a way for the FAI to get money into the League of Ireland clubs because if you look at the money certain [schoolboy] clubs were getting for getting players over to England, like one of the north side clubs would have been doing very well with that and would have been pocketing a fair few bob. In my opinion, at the beginning, I felt it was about getting money into the League of Ireland clubs without having to do it themselves, and I still would be of the same opinion.

With young players transferring from schoolboy clubs to NL clubs at earlier ages, this reduces the proportion of the transfer fee schoolboy clubs receive if a player transfers to a professional club abroad. This may heighten tensions between both entities over player transfers. Contrastingly, FAI coaches took an opposing view and the majority indicated that the NLs were introduced to create an environment that would assist in developing players capable of representing Irish international teams:

[The purpose of the NL is] to give them a roadmap for their development so they can continue to improve and ultimately allow them to not only achieve whatever their potential may be but hopefully to become a professional player, and also to assist and to create better players for our underage and senior international teams. [FAIC3]

NL coaches provided a variety of responses that differed from that of schoolboy coaches and parents. NL coaches indicated that the two primary goals of their club were to produce players for first-team football: 'For me, as head of academy at my club, my sole interest would be to get players into the first team at our football club' [NLC10], and to produce players for Irish international teams: 'I suppose it's getting better players to represent Ireland at international level' [NLC4]. Moreover, NL coaches cited additional reasons for the implementation of the

NL, including to create an environment for the best players to play with and against each other consistently, and to increase the standard of domestic football.

In respect to coaching standards in the NL, all parents reported that the coaching quality was overwhelmingly positive and were complimentary about how their children were developing as footballers since joining their respective academies. Parents were very happy with the coaching quality, citing it as, for example, 'second to none' [P8], 'as good as it gets' [P7] and "top-level, really, really good' [P3]. In particular, parents were encouraged by the high-quality and individualised approach to coaching. Typifying this, P9 commented:

> I have to say that excellent is the word that I would use for this coach and his backroom team. It's innovative, they don't get bored, he has them doing the serious stuff and there's a novelty factor. Organisation and communication, it's all just planned. I don't think he does anything else! He overdoes his job, in a good way.

In line with this, all NL coaches claimed that their coaching standards were high and were tailored toward player development. Moreover, NL coaches believed that their coaching was at a higher standard than that being provided in schoolboy football clubs. This may reflect the coach education policies implemented by the FAI. To coach at the underage NL level, coaches must be qualified at UEFA B (under 14) and UEFA A (under 15-17) standards. Although NL coaches commented on how the standard of coaching at certain schoolboy clubs can be good, their impression was that the coaching quality at the schoolboy level is generally poor, mainly due to the reliance on parents/volunteer coaches: 'I just don't think the standards are there, I think that's the big one in that. Grassroots are fundamentally volunteers and you're relying on some volunteers taking things more seriously than others' [NLC1]. This reliance on amateur coaches at the schoolboy level was perceived to be particularly detrimental to player development from a technical standpoint:

I think it goes back to the coaching at the grassroots clubs for me. The big issue that I've had since managing at [NL Club] is the players' technical ability. They may be the better players at their grassroots clubs, and they've got good strengths and attributes, whether that be defending one to one or whatever it is, but I just find they're not technically comfortable. [NLC5]

In response to the perceived poor coaching quality at the schoolboy level and the subsequent lack of technically skilled players progressing through the pathway, six NL coaches and two FAI coaches cited the need for higher quality coaching to begin at earlier ages. Coaches explained how a lack of technically skilled players being developed in Ireland must be solved through earlier intervention by qualified coaches: 'I do believe that there needs to be more work done at a younger age, especially on the technical aspects. (…) It doesn't need to be as serious, but we should be focusing on it from 8, 9, 10 [years of age] in a fun technical way and really improving the technical aspects before they come into the National League' [NLC9]. Supporting this, NLC10 stated: It just makes sense; the younger you can get them and work with them, then the more positive impact you can have on their career and the better player they will be by the time they get to National League football'.

Contrastingly, five schoolboy coaches were critical of certain coaching aspects in the NL, particularly regarding the styles of play. Schoolboy coaches explained how young players were being 'overcoached' and the pressure to fit within tactical systems and set patterns of play was removing the freedom of expression in young players:

It's a bit sterile and it takes a bit of the freedom away from the child and has them playing a certain way and the way that they have to play. Whereas in grassroots football, there is a system, but there is a freedom there to go and express themselves. Its nearly overcoaching on systems and play. [SC4]

However, five schoolboy coaches did also mention positive aspects of NL coaching, citing it as, for example, 'more structured and more detailed' with 'more qualified coaches'.

**4.3.2 Alignment to Talent Development Principles**

*4.3.2.1 Early engagement*

Seven NL coaches stated that most players within their club have given up other sports to focus on football. Coaches felt players were deciding to invest in football due to a love for football and to give themselves the best opportunity to maximise their development:

> I think we have twenty players, and off of the top of my head, three of them play GAA (Gaelic Games) at the same time, other than that, that's it, so for seventeen of my players, their only sport is football. I think if we were at schoolboy, it wouldn't be. I think it's because its National League, they think 'this is a really good chance for me, and I love the environment and I want to give this everything'. [NLC6]

Coaches also explained how numerous academy players have given up other sports and now use that spare time to undertake additional football training outside of the academy on non-training days:

> I know there are loads of players doing extra training and even getting one-to-one coaching on the days that we are not training. So, there are some that are putting just as much time into football as they are putting into school. [NLC4]

This viewpoint was reiterated by several parents of NL academy players. Parents explained how their children enjoyed playing football and had ambitions to become professional players and, with this in mind, made the decision of their own accord to stop playing other sports:

102

That's his choice [to give up other sports]. I think he's made that choice because he thinks he's a good footballer and he wants to see how far he can go, and he knows he needs to work. [P5]

Unlike the academy system in countries such as England where players can enter the pathway at age six (English Premier League, 2011), the Irish academy system begins at 13. Participants in this study suggested that when academy players enter the pathway at 13, many decide to focus solely on football. However, all parents did reiterate that participation in other sports in their child's school environment was still compulsory, so no players had completely delaminated participation in other sports.

Six participants commented on the important role of football-specific free play in player development. Participants commented on how the lack of elite-level Irish players being produced over recent decades may be correlated to the lack of engagement in football free play by recent generations:

Probably, what our players need to do more of is be out in the garden or out with their friends kicking a ball around. That's probably why we as a nation were a lot more competitive 20 years ago; because players were getting so many hours in, not just with teams and coaches, but they were getting them in their back garden or school or whatever. [NLC5]

Such suggestions mirror the recommendations of Zibung & Conzelmann (2013) and Sieghartsleitner et al. (2018), who proposed that the pathway should provide large amounts of football-specific activity but delivered in broad and diverse developmental formats. Supporting this, NLC2 reflected:

There's kids who come out of Brazil who don't get coached and they just play [football] constantly for hours and they just figure things out themselves, and all they play is football all day, all night. They're volleying the ball, they're doing beach football, everything is done with the football. What's the biggest single population that produces footballers in this world? It's the favelas in Brazil, but nobody [coaches] touches them until they're 14, but they play every day, and they only play one sport every day.

However, most participants commented on how the football pathway and decisions surrounding player development policies needed to account for the uniqueness of the Irish cultural context in which the pathway exists. Despite the perceived benefits of early engagement in football, participants cited how the GAA is a unique, but dominant part of Irish culture that goes beyond sport and heavily influences both sporting and societal contexts: 'Gaelic is so predominant, it's so patriotic, it's more than just which sport do you play. (…) Gaelic is just intertwined with social life' [P4]. Moreover, participants commented on how implementing a player development system like those adopted in other successful European football nations would be very difficult, as culturally 'football in Ireland is competing with the GAA' [P1]. From a player development perspective, such cultural ties with the GAA were seen as a barrier long-term:

I have two lads [in my team] who are from here but play down with me in [Names Location] and their school is just hurling. So, their chance of getting football in school is nil. If you took a football onto one of their hurling pitches, you'd get expelled I'd say, it's that serious. So, this is where the problem comes in. [NLC3]

We are unique in terms of some countries because in some countries, all they have is football, whereas we've got Gaelic and Hurling. There's a lot of young people living in country villages and stuff like that, and you play for your [GAA] team. Sometimes we

do want them to play football, but tradition, values and beliefs come in the way, and I think as a society in Ireland, that's our stumbling block. [NLC8]

Despite this, all participants commented on the benefits of playing other sports throughout childhood and into early adolescence, and no participants expressed a belief that children should focus solely on one sport throughout these formative years. Specifically, twenty-six participants cited the biopsychosocial benefits of playing multiple sports as an important factor in childhood development. In addition, twenty-five were strong advocates of the need for children to sample other sports throughout childhood before they reach their teenage years:

I think at seven, eight, nine, ten, eleven [years old] and before they go into the pathway at 13 or 14 for the League of Ireland, and it's the same with the GAA; they've gone 13 as well, I think up to eleven or twelve you should be encouraging it [playing other sports]. [SC8]

Eleven participants also commented on how they felt that players should be encouraged to recreationally participate in other sports on their non-football days outside of the academy:

I do say to them, especially when we're in the off-season, pick up golf, pick up tennis, basketball with your friends, I think all of that is important to do and we do encourage them to do that as long as it doesn't conflict with what we do. We do encourage them. It is important to do other sports. [NLC6]

*4.3.2.2 Systematic Barriers to Player Development*

The majority of NL coaches, schoolboy coaches and FAI coaches were all critical of the lack of facilities in the NL, citing it as the biggest organisational barrier to player development in Ireland. NL coaches were particularly critical of the lack of training and match facilities, and expressed the need for intervention across the country:

We massively struggle with facilities. I don't know if you've been to [location where matches are played], but that needs to be updated to kick players on. I think that would be the case in a lot of clubs around the country. Then gyms, proper astroturf pitches, better quality surfaces to play on. For me, that's a big thing. [NLC5]

Such concerns were reiterated among FAI coaches:

When you look at the National League clubs…I can tell you we've got schoolboy clubs in this county that have their own clubhouse, they've got two all-weather pitches, and they cater for an academy on a Saturday morning of about 400 kids. Then we've got two National League clubs… they don't have a training ground that they own, they don't have a pitch that they own. [FAIC2]

Schoolboy coaches also criticised the standard and accessibility of facilities in the NL. Schoolboy coaches believed that the standard of facilities in the NL are no better than schoolboy clubs and commented on how many NL clubs were renting training facilities from third parties:

You go to [NL Club] and it's like going back in the dark ages, they don't have their own facilities and they train in a public park, it's not even a step up. If you look across the whole of the National League, you could probably look at two or three clubs that have really good facilities. Like [NL Club] don't have any training facilities, they go around and use astroturf pitches all around. Really, from a set-up perspective, there is nothing there to entice children to say, 'this is where I want to be' (…) facilities-wise, it's extremely poor. [SC4]

Ninety percent of NL clubs share facilities with another club/external source, and when taken in comparison to nations with similar demographics, access to facilities in Ireland is

substantially lower (UEFA, 2020). For example, each professional Danish club has nearly double the amount of full-sized grass pitches and has nearly three times the number of artificial pitches than each Irish NL club (UEFA, 2020). Additionally, all NL coaches cited the lack of a full-time football industry in Ireland as a major systematic flaw in the player development system. NL coaches expressed frustrations over the lack of full-time coaching positions within NL academies and how they were expected to manage the development of the highest potential young footballers in Ireland whilst also trying to balance full-time jobs elsewhere:

> You will find most of the coaches, even though they're highly qualified, they're part-time! Like I work, I finished work today at 2 pm. I've been in since 6 am and I finished at 2, and the nights I train I come home and have something to eat and then I'm on the road again at half 5 and I probably don't get home until 10 that night. [NLC3]

> People are always saying we should have academies like in England, like Liverpool's academy. Well, there's no full-time staff, so who coaches these kids all day long? The fact [is] that we don't even have an industry. [NLC6]

On average, each European premier division club employs 5-7 full-time academy coaches who are exclusively dedicated to youth development (UEFA, 2020). At the time of investigation, across all clubs ($n = 25$) and all age cohorts (under 14-19) in the underage NL, there was a total of 6 full-time staff, none of whom were exclusively dedicated to coaching (League of Ireland and FAI Academy Development Manager, personal communication, 2021). In this regard, Ireland is ranked within the lowest threshold in Europe for full-time staff dedicated to organisation/logistics, medicine, education, coaching, and scouting/analysis (UEFA, 2020).

In line with this, ten participants were also critical of the lack of financial investment in Irish football. To bridge the gap to other European countries at a senior international level, and to

ultimately develop a larger number of high-quality players, participants expressed the need for large scale financial investment in Irish football, as exemplified by FAIC3:

> I think if we look at the National League clubs, even the grassroots clubs, obviously the FAI programmes; the more you put in, the more you get out. And the reality of it is if you look at any of our programmes and you question 'what do we want to get out of this?', if someone says, 'we want f\*\*cking our senior national team to be qualifying for major European and world finals off the crop of players we have now', you need to put more money in! That's the reality of it. For what the FAI is putting in, and listen, I'm FAI through and through I'll support them until the day I die, but the place is obviously in the sh\*t at the moment, so what we're putting in is not getting us to world cup finals in 15 years' time, not a chance! Unless every other country stops doing what they're doing, we ain't getting nowhere!

*4.3.2.3 Lack of Appropriate Challenge*

Participants expressed concerns that the NL were failing to provide appropriate levels of challenge for young players. The importance of providing appropriate levels of challenge in TD has been emphasised in literature elsewhere (e.g., Collins et al., 2016; Collins & MacNamara, 2012; Savage et al., 2017, 2022; Taylor & Collins, 2019, 2021). Specifically, in this Irish football context, fifteen participants from across all stakeholder groups expressed a view that there were large variations between the standard of teams within the NL, characterised by one-sided score-lines and uncompetitive matches. Consequently, it was believed that players from the stronger teams in the NL were not being challenged appropriately, and the players from teams of lesser quality were being exposed to an environment that was not suited to their needs at that particular stage of their development. Typifying this, SC4 commented:

I think if we look at the National League, it's probably not challenging for about three or four clubs who are operating at a totally different level from a National League perspective. They don't get challenged on a week-to-week basis. Some of the children, if they stayed in their local leagues, would have more of a challenge than when they go and play some of the other clubs and win 5, 6, 7, 8-0; that's not a challenge and neither party is learning in that regard.

NL coaches also expressed concerns that players were not being challenged frequently enough due to a lack of coaching contact hours and matches. A player aged 12-16 in a category 1 UK football academy gets 12-16 coaching contact hours a week (Read et al., 2016). The consensus among coaches in this study was that players aged 13-15 in a NL academy get 3-6 hours per week. This lack of contact hours was considered particularly disadvantageous to player development in Ireland, as NLC6 explained:

I think we don't do enough. The contact hours are nowhere near enough. It's crazy to think what everyone else is doing in Europe and players are developing and we're not developing players at the moment in my opinion. I think we don't have enough contact.

*4.3.2.4 An Emphasis on Short-Term Success*

Seventeen participants expressed concerns that an emphasis was placed on short-term success over long-term development, opposing a key principle of TD outlined by Martindale et al. (2007). The majority of parents believed that there was an overemphasis on winning matches throughout the NL which took priority over player development, as P6 reiterated:

You'd like it all not to be so results orientated. You'd love there to be metrics to judge teams based on how they develop players and not how many games that they win. The table is still a table based on how many points a team gets, there's no other table to

109

show other metrics that are important. In our league, it's all about goals, winning and points, but that means then that all the actions that we do are trying to reach them goals.

This feeling was reciprocated by several NL coaches:

There is an emphasis on winning and some teams and some coaches will win at all costs (…) There's always pressure to win matches. I think in different clubs there's different ethos and value put on winning matches, and sometimes in the National League, it's winning ahead of development. [NLC4]

*4.3.2.5 Biological Maturation*

Participants were concerned that a selection bias existed throughout the NL in favour of early maturing players. Most parents and schoolboy coaches explained how they felt that player identification and release/retention was based upon physical, physiological, and functional attributes, and the early maturing players were being preferentially selected into and retained within NL academies:

There are some lads and you just look at them and think 'how is he 14?'. He gets picked because of that. Physically, he may be strong, but technically he may not be that strong. All these guys get lumped into one bucket based on age and the consequence of that is that what coaches look for in that bracket is physicality rather than technical ability. [P6]

Such a selection bias in favour of early maturing athletes is not uncommon and has been observed within football academies outside of Ireland (e.g., Hill et al., 2020; Johnson et al., 2017). Nine participants felt that later maturing players were being overlooked in selection for NL academies. Additionally, several participants believed that NL players should be categorised by physical size rather than chronological age. Moreover, ten participants believed

that later maturing players were being hindered by the misalignment of age structures within the NL. The age structures of the NL currently run bi-annually from under 15 onwards (i.e., under 15, 17, 19) instead of annually (i.e., under 15-16-17). Participants believed this to be particularly disadvantageous to the later maturing players within the academy pathway, as NLC9 explained:

> Probably one of the biggest issues that you find, especially going from 15 to 17, is that late developers need to be catered for. That's something I'm seeing at the moment in our under 15s; we have a mixture of sizes and stuff even at this age, and they're all born in the same year. You could have an exceptional under 15, but physically he might be a late developer and he steps up to under 17 level and it's a huge challenge physically and there is a year gap there as well, so not only is he dealing with the physical gap of his own age, but also the physical gap of players the year older.

**Table 4.1.** The overarching themes, themes, and sub-themes produced from the RTA.

| Overarching theme | Theme | Sub-theme | Raw data theme | Mentioned by participants (%) | | | |
|---|---|---|---|---|---|---|---|
| Stakeholder coherence | Vertical coherence | Lack of shared understanding regarding the purpose of the player pathway | Generate finances from selling players to clubs abroad | 40% NLC | 75% SC | 56% PAR | 25% FAIC |
| | | | Provide a pathway to first team football | 80% NLC | 25% SC | 33% PAR | 25% FAIC |
| | | | Produce players for Irish international teams | 60% NLC | 20% SC | 33% PAR | 75% FAIC |
| | | | Provide an environment for the best players to play with and against the best players | 50% NLC | 38% SC | 44% PAR | 25% FAIC |
| | | | Increase the standard of domestic football | 50% NLC | 13% SC | 11% PAR | 25% FAIC |
| | | Disjointed relationships between National League and schoolboy clubs | The poor relationship between National League clubs and schoolboy clubs is hindering player development | 100% NLC | 100% SC | 89% PAR | 75% FAIC |
| | | | Schoolboy clubs are reluctant and uncooperative in transferring players to the National League clubs | 90% NLC | 50% SC | 78% PAR | 75% FAIC |
| | | | Schoolboy clubs dislike the loss of power caused by the introduction of the National Leagues | 70% NLC | 33% SC | 56% PAR | 75% FAIC |
| | | | National League clubs inappropriately approach players without cooperating with schoolboy clubs | 20% NLC | 25% SC | 33% PAR | 25% FAIC |
| | | | The misalignment in youth football seasons is hindering player development | 0% NLC | 25% SC | 22% PAR | 50% FAIC |
| | | Poor relationship between the FAI and the SFAI | The FAI and SFAI do not cooperate or communicate | 30% NLC | 38% SC | 44% PAR | 50% FAIC |

| | | | | NLC | SC | PAR | FAIC |
|---|---|---|---|---|---|---|---|
| | | Conflicting opinions regarding the quality of coaching throughout the pathway | The standard of coaching in the National Leagues is optimal for player development | 100% NLC | 25% SC | 100% PAR | 0% FAIC |
| | | | The style of play being coached in the National Leagues is poor | 10% NLC | 63% SC | 0% PAR | 25% FAIC |
| | | | Higher quality coaching needs to begin at earlier ages | 60% NLC | 13% SC | 22% PAR | 50% FAIC |
| | | | The quality of coaching at the schoolboy level is generally poor | 90% NLC | 63% SC | 56% PAR | 25% FAIC |
| | | | The quality of coaching at the schoolboy level and in the National Leagues is the same | 0% NLC | 38% SC | 0% PAR | 0% FAIC |
| | Horizontal coherence | Poor relationships between coaches and parents within National League academies | Parents of academy players can be overbearing | 80% NLC | 0% SC | 33% PAR | 50% FAIC |
| | | | Lack of communication from coaches to parents | 0% NLC | 0% SC | 56% PAR | 0% FAIC |
| | | | Lack of parental education | 10% NLC | 25% SC | 22% PAR | 25% FAIC |
| | | | Open and regular lines of communication exist between National League Coaches and Parents | 50% NLC | 0% SC | 11% PAR | 0% FAIC |
| | | Concerns over the youth to senior transition | There is a divide between academy teams and the senior departments at National League clubs | 50% NLC | 13% SC | 22% PAR | 50% FAIC |
| | Early engagement | Football player engagement | Academy players have given up other sports to focus on football | 70% NLC | 0% SC | 56% PAR | 0% FAIC |
| | | | When players enter the academy pathway the majority of their sporting activity should be devoted to football | 60% NLC | 25% SC | 44% PAR | 75% FAIC |
| | | | Football free play is essential for development | 40% NLC | 13% SC | 11% PAR | 0% FAIC |

| | | | | NLC | SC | PAR | FAIC |
|---|---|---|---|---|---|---|---|
| Alignment to talent development principles | | Opinions about engagement in other sports | There are biopsychosocial benefits of playing other sports | 90% NLC | 63% SC | 89% PAR | 100% FAIC |
| | | | Academy players should be encouraged to recreationally participate in other sports on non-football days | 50% NLC | 0% SC | 33% PAR | 75% FAIC |
| | | | Sampling other sports is important during the childhood years of development | 70% NLC | 75% SC | 89% PAR | 100% FAIC |
| | | Irish culture | The GAA is an important part of Irish culture | 70% NLC | 63% SC | 44% PAR | 25% FAIC |
| | | | Irish culture is multiple sport participation | 50% NLC | 38% SC | 11% PAR | 0% FAIC |
| | Systematic barriers to player development | Lack of appropriate resources in the National Leagues | Lack of facilities | 70% NLC | 75% SC | 22% PAR | 100% FAIC |
| | | | Lack of financial investment in Irish football | 40% NLC | 38% SC | 22% PAR | 25% FAIC |
| | | | Lack of a full-time football industry | 90% NLC | 13% SC | 0% PAR | 25% FAIC |
| | Biological maturation | Early biological maturation selection biases | Player selection is based upon physical attributes | 30% NLC | 63% SC | 89% PAR | 0% FAIC |
| | | | Later developing players are overlooked in selection | 20% NLC | 50% SC | 33% PAR | 0% FAIC |
| | | Lack of developmental opportunities for later maturing players | National League age gaps hinder later maturing players | 30% NLC | 38% SC | 22% PAR | 50% FAIC |
| | | | Players should be matched by physical size rather than age | 20% NLC | 13% SC | 11% PAR | 0% FAIC |
| | | Uncompetitive matches | Large score-lines and uncompetitive matches | 50% NLC | 50% SC | 56% PAR | 25% FAIC |

| | Lack of appropriate challenge | Lack of contact hours | Lack of training hours | 70% NLC | 13% SC | 33% PAR | 50% FAIC |
|---|---|---|---|---|---|---|---|
| | | | Lack of matches | 20% NLC | 25% SC | 0% PAR | 0% FAIC |
| | An emphasis on short-term success | A focus on short term results | A focus on winning matches | 70% NLC | 38% SC | 56% PAR | 50% FAIC |

FAIC = Football Association of Ireland Coaches, NLC = National League Academy Coaches, PAR = Parents, SC = Schoolboy football club coaches.

## 4.4 General Discussion

Using a representative sample of stakeholders engaged within Irish underage football, the results of this study highlight the lack of horizontal and vertical coherence across the Irish football pathway. This incoherent player pathway and the disjointed relationships between stakeholders were suggested as a significant barrier to long-term player development.

Vertical coherence in Irish football should lead to a symbiotic working relationship between the SFAI, NL clubs and the FAI. Previous research suggests that football organisations should place value in creating vertically integrated processes of TD (Taylor & Collins, 2021; Webb et al., 2016). However, vertical integration throughout the pathway in Ireland does not exist. All stakeholders cited how a fractious relationship existed between schoolboy football clubs and NL academies, characterised by conflicts over player transfers, financial disputes, and dissonance over the control of player development. This lack of vertical integration was perceived to be intertwined with the poor historical relationship between the FAI and SFAI. The disconnect between the SFAI (an affiliate of the FAI) and the FAI regarding what is best for player development appears a major obstacle for player development in Ireland. Having NGB affiliates self-governing and operating independently from the NGB is not best practice in player development (Webb et al., 2016), particularly when individual leagues within the affiliate operate independently from each other. Indeed, it has been stated that effective TDEs are distinguished by the existence of a strong organisational structure throughout the pathway (Henriksen et al., 2010a, 2010b). The evident lack of integration between schoolboy football clubs and NL academies was exemplified by the lack of shared understanding regarding the quality and provision of coaching and the purpose of the NL academies, and ultimately, the purpose of each step of the player pathway. In theory, a shared understanding of player development in Ireland would entail schoolboy clubs working closely with NL clubs to facilitate the transition of players between the schoolboy level and the academy environment

(cf. Webb et al., 2016). Whilst this shared understanding and vertically coherent player development system ceases to exist, the player development pathway within Irish football is unlikely to be optimised (Mills et al., 2014a).

A lack of horizontal coherence was also apparent at the NL level, most notably in the relationships between coaches and parents. The existence of horizontal coherence in an academy context should see academy coaches and parents working with each other and with the player in an agreed fashion to optimise the player development experience (Taylor & Collins, 2021). However, the academy system was characterised by poor communication and a lack of role clarity between coaches and parents. Parents expressed concerns over the lack of regular and comprehensive communication from coaches, which is a common concern within football academies elsewhere (Clarke & Harwood, 2014; Harwood et al., 2010). On the other hand, coaches explained how parents can often interfere with coaching practices, most notably by providing inappropriate and contradictory coaching advice (Mills et al., 2012). Such findings indicate that parents often appear unaware of the role coaches expect from them and suggest the need for academies to work with parents to build a more mutual and cohesive relationship tailored towards a more appropriate experience for young players (Clarke & Harwood, 2014; Mills et al., 2012; Newport et al., 2021).

Multiple participants raised concerns over the youth to senior transition within the NLs. Participants explained how academy and senior team operations are not aligned and how the transition from academy to first-team football is too great for many players. The youth to senior athlete transition has traditionally been noted as the most challenging transition in an athlete's career (Stambulova et al., 2009). Dichotomy between the two stages of the pathway is likely to have detrimental repercussions for successful player development (Mills et al., 2014a, 2014b). In a NL context, it appears that youth and senior team operations and transitions are not well integrated.

Despite the lack of stakeholder coherence across and within the pathway, several key TD principles between the stakeholders appear well understood. For instance, participants highlighted the need to provide appropriate and individualised challenge for players throughout the pathway (Collins et al., 2016; Collins & MacNamara, 2012; MacNamara et al., 2010a, 2010b; Savage et al., 2017, 2022; Taylor et al., 2022a, 2022b; Taylor & Collins, 2019, 2020, 2021) and noted the need to emphasise long-term development over short-term success (Henriksen et al., 2010a, 2010b; Martindale et al., 2005, 2007). Despite this, as is the case in many TD pathways (e.g., Curran et al., 2021; Pankhurst et al., 2013), the implementation of these TD principles in an applied context does not appear to exist. In this respect, participants were critical of the academy system and explained how players were not being provided with appropriate or individualised levels of challenge.

Participants described how they believed an early engagement in football to be optimal for player development. They also emphasised the importance of devoting the majority of childhood activity to football to maximise development before entering an academy at age 13. The importance of experiencing large amounts of football-specific learning activities during childhood has been discussed in Chapter 3. However, participants believed that this should not be at the expense of participation in other childhood sporting activities, particularly up to 12 or 13 years of age. Crucially, participants acknowledged the unique context in which the Irish player pathway exists and the cultural dominance of the GAA. Indeed, culture has an over-arching emphasis on the development of talent (Henriksen et al., 2010a, 2010b; Martindale et al., 2007). In this respect, implementing a player development system like those seen in other football nations (e.g., English Premier League, 2011) may not be viable nor appropriate in an Irish-specific context as it may conflict with cultural and societal norms (Martindale et al., 2007).

In line with the key principles of effective TDEs (cf. Martindale et al., 2007), participants were critical of the emphasis that was placed upon winning matches at the academy level. The use of short-term success as a marker of effectiveness within the NL appears short-sighted, especially given that the system is suggested to specifically focus on producing Irish internationals and senior first-team club players. Fundamentally, football academies exist to produce individual players, not successful academy teams (Mills et al., 2012). Without a change in emphasis on winning academy football matches, problems will continue to exist in player selection, coaching, and the subsequent experiences of the academy players (Martindale et al., 2007).

Ultimately, stakeholders in the Irish pathway appeared to understand several key TD principles, but this has not led to the consistent implementation of these principles in the development of young Irish players. Consequently, young footballers in Ireland appear to be facing several systemic challenges that will inevitably inhibit their development as they progress throughout the pathway. So long as these inappropriate challenges persist for young players, the player development experience will not be optimised (Martindale et al., 2007). From a research perspective, these findings appear somewhat consistent with the extant literature (e.g., Curran et al., 2021). Indeed, Collins et al. (2019) has raised concerns over the research-practice divide, with issues raised over how much of the TD literature has failed to make a meaningful difference in an applied context. Future research should now seek to identify how many of these inappropriate challenges for young Irish players can be negated. Ultimately, there is no simple solution, but inevitably, establishing a coherent pathway experience for young players (e.g., Henriksen et al., 2010a; 2010b) must be of strategic priority for the FAI.

## 4.5 Limitations

Given that the focus of this research was on the Irish football player pathway, results and their implications are specifically limited to an Irish football context. In this respect, findings may not apply to non-Irish contexts or alternative sporting pathways. It is up to non-Irish readers to consider the transferability of these findings (see section 1.9) to their specific sporting and cultural context. However, given the recent restructure of the Irish football player pathway and the introduction of the newly formed underage NLs, it was crucial from both an organisational and practical perspective to explore stakeholder perceptions of the player development experience. This was the first research of its kind to comprehensively analyse the Irish football player pathway from the perspectives of the key stakeholders. Given the extensive ($n = 31$) and contemporary participant sample of this research, along with the nature of data collection (one-to-one interviews to facilitate an in-depth and individualised investigation), the validity and reliability of these findings are enhanced. In this regard, results can be utilised to guide decisions on future player and coach development policies within the FAI. An additional limitation of this research was that it focused on the Irish player pathway for male players only. Although some participants who were interviewed in this research study were female, the research focus lacks gender diversity.

## 4.6 Conclusion

The question for Irish football is whether Ireland can consistently produce players capable of competing at the highest level of international football when young players develop in a multifaceted pathway and a cultural climate where football exposure time is limited due to competitive participation in multiple sports until mid-late teens. As discussed in Chapter 3, the benefits of this approach in football player development remain unclear. With a lack of vertical

and horizontal stakeholder coherence, coinciding with a lack of full-time staff, facilities, financial investment, and football exposure time, Irish football is arguably faced with its biggest ever challenge to develop players capable of competing against its international counterparts. The practical implications of these findings in the Irish football context are discussed in section 9.3.2 in Chapter 9.

# Chapter 5: A Tale of Two Selection Biases: The Independent Effects of Relative Age and Biological Maturity on Player Selection in the Football Association of Ireland's National Talent Pathway.

## 5.1 Introduction

Chapter 4 sought to examine the extent of horizontal and vertical stakeholder coherence across the FAI's TD system, as well as explore key stakeholder perceptions of, and alignment to, TD principles. Whilst stakeholders expressed several concerns regarding the appropriateness of the player pathway (e.g., a perceived overemphasis on short term success, lack of appropriate and individualised challenge), one predominant concern raised by stakeholders was the perception that a selection bias existed in favour of early maturing players throughout the pathway. This perception is somewhat unsurprising given that selection biases in favour of early maturing players is consistent across other professional football academies (Cumming, Brown, et al., 2018; Cumming, Searle, et al., 2018; Hill et al., 2020; Ruf et al., 2021; Towlson et al., 2022; Zuber et al., 2016). The factors contributing to the selection biases in favour of early maturing players have been outlined in section 2.5.2 of Chapter 2, and are predominantly attributed to the physical, physiological, and functional advantages resulting from advanced maturation

(Brown et al., 2017; Buchheit & Gundersen et al., 2022; Malina et al., 2004; Mendez-Villanueva, 2014; Meylan et al., 2010; Radnor et al., 2021). Consequently, late maturing players are often denied access to academy and national talent pathways, and thus, are denied exposure to the professional coaching, sports science and medical support, superior training equipment and facilities, and increased levels of competitive challenge that are typically associated with such systems (Hill et al., 2020; Johnson et al., 2017). If denied exposure to the academy system, late maturing players are less likely to reach the senior level of professional football (Hill et al., 2020; Johnson et al., 2017). Since the advantages of early biological maturation are generally no longer present once players reach the age of 18, drawing the majority of players from a sample of early maturing players is a flawed strategy; in essence, the pool to select talent from has been greatly reduced by excluding on time and late maturing players (Johnson et al., 2017). Whilst this in no way suggestive that there is a need for the FAI to move towards a complete equity of selection processes based upon maturation statuses, if selection processes within the FAI's player pathway are excluding large cohorts of players based predominantly upon maturation status, this is an area that warrants further attention, particularly given the perception among stakeholders in Chapter 4 that there is no route back in, and that there are marked differences in developmental provision between those who are in, and out, of the system.

Reflecting upon the points raised in the preceding paragraph, it was, therefore, crucial to identify the extent to which biological maturation selection biases existed across the FAI's TD system. Relative age and biological maturation present two non-modifiable factors that consistently influence player selection and performance in youth football (Hill et al., 2020; Johnson et al., 2017). Evidence from professional football academies in non-Irish contexts suggests that the RAE is present from early childhood and remains relatively stable with chronological age, whereas the selection biases associated with advanced biological maturation

123

emerge at age 11-12 years and increase in magnitude with chronological age and the level of competition (Hill et al., 2020; Johnson et al., 2017). Indeed, and as outlined in Chapter 2, the RAE has been proposed to be a result of age and experiential differences present from early childhood (e.g., event-specific knowledge and understanding, decision making, neuromuscular development, cognition, behavioural and psychological development, social development (Hill et al., 2020; Parr et al., 2020a)), whereas biological maturation status is determined by a combination of genetic and, to a lesser extent, environmental and behavioural factors (i.e., chronic malnutrition, disease, climate) (Beunen et al., 2006).

Throughout literature and practice, these two concepts have historically been incorrectly interpreted as synonymous (e.g., Cobley et al., 2009; Helsen et al., 2005; Mann & van Ginneken, 2017; Mujika et al., 2009; Musch & Grondin, 2001). For example, Helsen et al. (2005, p. 629) concluded that the RAE's observed across U15-U18 youth international footballers was due to the differences in biological maturation between players, stating that 'players with a greater relative age are more likely to be identified as "talented" because of the likely physical advantages they have over their "younger" peers'. Mujika et al. (2009, p. 1157) discovered the existence of RAEs in Spanish football academy players and stated that 'chronological age grouping in male youth competitions tends to give an advantage to a boy who is relatively older and is likely due to his physical maturity', concluding that 'relatively older players enjoy early recognition from talent scouts presumably due to their physical maturity'. Emerging evidence suggests that these two constructs are, however, completely independent (Hill et al., 2020; Johnson et al., 2017; Towlson et al., 2022). In an examination of 202 players aged U9 to U16 in one English Premier League academy, Hill et al. (2020) identified a RAE from the U9 age group that remained relatively stable with chronological age, whereas selection biases in favour of early maturing players emerged from the U12 age group and increased in magnitude with chronological age. The authors found either small or no

associations between relative age and biological maturity status in players (Hill et al., 2020). Moreover, in an investigation of two further professional football academies, Johnson et al. (2017) observed that selection biases in favour of early maturing players emerged from the U11 age group and increased linearly with age. This bias increased linearly to such an extent that those players who were advanced in maturation were up to 20 times more likely to be retained within the academy system (Johnson et al., 2017). On the other hand, relative age biases were present upon academy entry (U9 age group) but were much smaller in magnitude and remained relatively consistent with age. This evidence would suggest that the RAE is a stronger predictor of selection at the foundation (i.e., childhood) level and biological maturity is a stronger predictor of selection from the onset of adolescence in a youth football context.

Indeed, there appears to be little to no association between these two factors, and the magnitude to which they influence player selection into football academies differs significantly (Hill et al., 2020; Johnson et al., 2017). However, while these two biases exist and operate independently, it is important to note that they both strongly influence talent identification and selection (Cobley et al., 2009; Hill et al., 2020; Johnson et al., 2017; Lovell et al., 2015; McCarthy et al., 2022; Towlson et al., 2022). Therefore, it is likely that those athletes that are both relatively younger and late maturing face a double disadvantage and are the least likely to be selected, although evidence to support this proposition is currently lacking.

Most studies investigating maturity associated selection biases in youth football have involved professional academies (e.g., Cumming, Brown, et al., 2018; Cumming, Searle, et al., 2018; Hill et al., 2020; Johnson et al., 2017; Ruf et al., 2021). As youth international football is a higher level of competition than academy football, it is likely that these selection biases are greater in magnitude when considering those youth selected to represent their countries at the international level. That said, comparatively few studies have focussed upon national junior programmes. Reflecting the third aim of this thesis outlined in Chapter 1, this study aimed to

1) examine the extent to which biological maturation and relative age selection biases existed across competitive age groups in an analysis of players within the FAI's national TD system and international representative squads, and 2) investigate the associations between biological maturation and relative age. This was the first research examining the simultaneous influence of biological maturation and relative age on player selection at the national level of a Football Associations' player pathway. Based upon the literature outlined in Chapter 2, it was hypothesised that RAE and biological maturation selection biases would be present across all age groups, yet unrelated from one another, with the selection biases in favour of advanced biological maturation being more prominent and increasing in magnitude with chronological age.

## 5.2 Methods

### 5.2.1 Research Context

As addressed in section 1.2 of Chapter 1, the FAI is the NGB for football in Ireland. As the governing body of a country with no professional underage competition, coaching or development structure, the FAI have created the Emerging Talent Programme to assist in the structured development of young players nationwide. The first national talent selection programme within the FAI's boys' player pathway is the National Academy. The FAI's National Academy is a development programme that was created to assist in the development of Ireland's highest potential players in the under 13 and 14 age cohorts (begins at 12 years of age) (Football Association of Ireland, 2022). One primary aim of the National Academy is to provide a higher quantity and quality of players for national and international teams. The National Academy selects those players perceived to have the highest potential in Ireland across all clubs for a two-year cycle and exposes them to increased amounts of training and

competition, in addition to coaching and developmental support in preparation for international football. The National Academy consists of 1-2 training events per month. Following the completion of the National Academy, the next selection phase in Irish football's national talent pathway is the Ireland under 15 national team, followed by the Ireland under 16 national team. The FAI's boys' national player pathway is depicted in Figure 5.1.
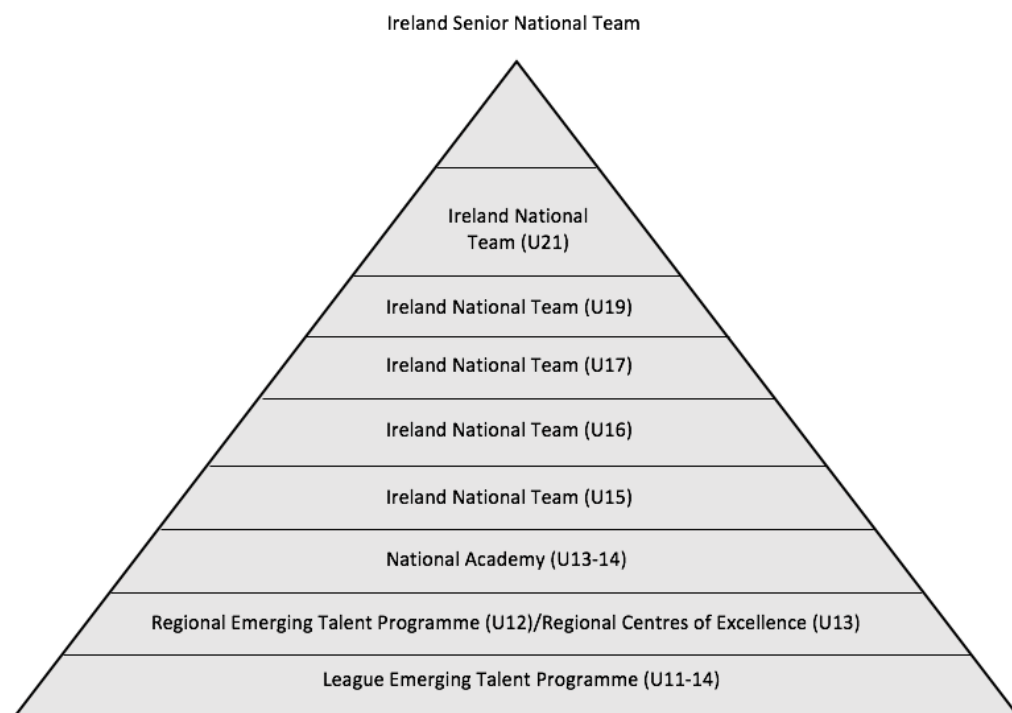


Figure 5.1. The FAI's (inter)national male player pathway.

## 5.2.2 Participants

A total of 159 participants had their biological maturation status and relative age assessed. The players assessed were members of either the FAI National Academy (IRE13) (n = 125), the Ireland under 15 national team (IRE15) (n = 18), or the Ireland under 16 national team (IRE16) (n = 16). Data was collected before training sessions over the first quarter of the year and each player was assessed once. In practical terms, 100% of players selected into a given national

squad that were invited to participate in this research consented. As such, the sample was representative of all players within the national talent pathway in the cohorts under investigation. Whilst ethnicity was not recorded as part of the programme selection procedures, the vast majority of the participants were Caucasian.

### 5.2.3 Ethics and Consent

Each parent/guardian was provided with a detailed information leaflet outlining the purpose of the research study and the procedures involved, and each player received an information leaflet adapted for minors before the start of this research investigation. Each parent/guardian provided written consent before data collection, and players were also required to provide written assent. Participants and their parents/guardians were informed that participation in this research was voluntary and that their status in their given national squad would not be influenced by their decision to participate. Ethical approval was granted by the Dublin City University Research Ethics Committee.

### 5.2.4 Anthropometric Data and Biological Maturity Status

The maturity status of each player was estimated using the percentage of predicted adult height (Khamis & Roche, 1994). Among children of the same chronological age, it is assumed that those closer to their predicted adult height are more advanced in maturation compared to those further removed from their predicted adult height. The Khamis-Roche method enables the prediction of a player's adult height using the regression formula based upon age and gender-specific regression coefficients detailed by Khamis and Roche (1994) in their analysis of residents enrolled in the Fels longitudinal study. The Khamis-Roche protocol requires the current age, height and weight of the child, and biological mid parent height (mean height of

biological parents). Players had their body height measured to the closest 0.1cm using a stadiometer (SECA, 217, Vogel and Halke, Hamburg, Germany) and their body mass measured to the closest 0.1kg using digital scales (SECA, 877, Vogel and Halke, Hamburg, Germany). Parents' heights were self-reported in centimetres, converted to inches and then adjusted for overestimation as outlined by Epstein et al. (1995):

$$y = 2.803 + 0.953x \text{ for women; } y = 2.316 + 0.955x \text{ for men}$$

where y = adjusted value and x = self-reported value (inches)

Mean adjusted paternal and maternal heights (178cm and 165cm, respectively) were in line with sex-specific means for Irish adults measured between 1985-2019 (Rodriguez-Martinez et al., 2020). In instances where a biological parent was not in contact with a player and their parent/guardians, a national average for adult height was used for that biological mother or father. The median error bounds between actual and predicted adult height using the Khamis-Roche method is 2.2cm in males aged between 4 to 17.5 years. For the age groups examined in this study, 12 to 16 years, the lowest 50% error was 1.3cm for 16-year-olds, and the highest 50% error was 2.8cm for 14-year-olds (Khamis & Roche, 1994). Using the percentage of predicted adult height has demonstrated construct validity as an indicator of biological maturation status in samples of healthy American, Portuguese and German youth (Malina et al., 2007, 2012; Ruf et al., 2021). Predicting adult stature using the Khamis-Roche formula is as follows:

$$\beta_0 + \beta_1 \text{ stature} + \beta_2 \text{ weight} + \beta_3 \text{ mid-parent stature}$$

where $\beta_0$ is the smoothed values of the intercepts, and $\beta_1$, $\beta_2$ and $\beta_3$ are the coefficients by which stature, weight, and mid-parent stature, respectively, are multiplied (Khamis & Roche, 1994, 1995).

The height of each player was expressed as a percentage of predicted adult height which was used as an estimate of relative biological maturity status at the time of observation (Hill et al., 2021; Parr et al., 2020a; Roche et al., 1983). Estimated relative biological maturity status was then expressed as a Z-score (i.e., difference between observed maturity status and expected maturity status) using the child's percentage of adult height compared to age-specific means and standard deviations (SD) outlined by Bayer & Bayley (1960) in the Berkeley Growth Longitudinal Study. Comparisons to reference values outlined by Bayer and Bailey have been utilised in recent football-specific studies on other European players (Bradley et al., 2019; Cumming, Brown, et al., 2018; Hill et al., 2021; Hill et al., 2020; Johnson et al., 2020). These Z-scores were then used to classify the youth players as late, on-time or early maturing. A Z-score of -0.5 to + 0.5 was classified as on-time maturity status; a Z-score of > +0.5 was classified as early maturity status; and a Z-score of < -0.5 was classified as late maturity status (as currently employed in the English Premier League Player Management Application) (Hill et al., 2020). The ±0.5 criteria were selected over the traditional ±1 criteria to better differentiate between players that were more advanced or delayed. Using the latter criteria, players presenting maturity Z-scores of -.99 and +.99 would be both considered 'on-time', when in reality there is almost 2 SDs of variance in maturation between them. I conducted all maturation assessments and calculations.

### 5.2.5 Relative Age

Players were categorised by relative age using their date of birth and the cut-off date for selection for their respective age group (In Ireland, selection age groups are determined by the calendar year; January 1st to December 31st). To create a developmentally sensitive measure of relative age, the difference between birth date and competition cut-off date was divided by 365.25 (number of days in a calendar year) and expressed as a decimal value ranging from 0-0.99 (youngest to oldest, respectively) (Cumming, Searle, et al., 2018; Hill et al., 2020). Relative age by Birth Quarter (BQ) is as follows: BQ1 (Oldest) (January 1st – March 31st) = 0.75-0.99 years, BQ2 (April 1st – June 30th) = 0.50-0.75 years, BQ3 (July 1st – September 30th) = 0.25-0.50 years, BQ4 (October 1st – December 31st) = 0-0.25 years.

### 5.2.6 Data Analysis

Data were analysed using SPSS Version 27. Descriptive statistics were used to examine the variance in biological maturation and relative age across the chronological age cohorts. A series of one-sampled means t-tests were used to examine the degree to which biological maturation and relative age selection biases existed across each age cohort and the total sample by comparing the observed mean values for relative biological maturation (Z-Score) and relative age (expressed as a decimal value) against the values expected for the general population (relative age = 0.50 years; maturity Z-Score = 0.0). Alpha = 0.05 was used for statistical significance. Subsequent tests of equivalence were used to determine the magnitude of any biases and the degree to which any biases were or were not equivalent to the absence of bias. A 90% confidence interval that existed within the ±0.5 Cohens D equivalence band was accepted as equivalent to the absence of bias. In contrast, confidence intervals that crossed the ±0.5 Cohens D equivalence band were accepted as not equivalent to an absence of a bias. Effect

sizes (Cohens D) were also used to examine the magnitude of any significant differences in the one-sampled means t-tests (small = 0.2–0.49; moderate = 0.5–0.79; large = 0.8-1.19; very large = ≥1.2) (Sawilowsky, 2009).

Spearman correlations (one-tailed) were used to examine the association between relative age and absolute maturity (percentage of predicted adult height), and between relative age and maturity relative to chronological age (Z-Scores) in each cohort and across the total sample. Absolute maturity status (i.e., percentage of predicted adult height) is an established indicator of maturity in youth and provides an indication as to how close players are to adult maturity. However, absolute maturity status does not account for individual differences in age between players in the same age cohort (i.e., the IRE13 cohort includes players that are both 12.1 and 12.9 years). Relative biological maturity status provides an indicator of maturity status relative to individual chronological age between players, without providing an indicator of how close a player is to adult maturity. As such, the association between relative age and both absolute maturity status and relative maturity status were investigated. A Chi-Square statistic was used to examine the distribution of players relative to maturity status (early, on time or late) and BQ (1, 2, 3 or 4) across the total sample.

## 5.3 Results

### 5.3.1 Part 1: The Extent of the Relative Age and Biological Maturation Selection Biases

The descriptive statistics for the variables of interest are presented in Tables 5.1 and 5.2, and Figure 5.2. The results of the analysis for relative age and biological maturity are summarised in Figures 5.3 and 5.4. The mean value for relative age was significantly greater than the expected value (0.5 years) in all age cohorts, demonstrating the existence of the RAE across the national talent pathway ($p < 0.05$). However, the magnitude of the RAE existed at only a small or moderate (Cohens D = 0.32-0.56) degree and remained relatively stable with

chronological age. The mean value for relative age for the entire participant sample was significantly greater than the expected value, but only by a small magnitude ($p < 0.001$, Cohen's D = 0.36). Although statistically significant, the bias for the RAE in both IRE13 and the entire participant sample was considered equivalent to the absence of bias. In contrast, the mean value for relative maturation status was significantly greater than the expected value (Z-Score = 0.0) across all age cohorts ($p < 0.05$). The magnitude of the statistically significant maturation biases ranged from moderate (IRE13, Cohens D = 0.56) to very large (IRE15, Cohens D = 1.85; IRE16, Cohens D = 1.88) and increased in magnitude with chronological age. The mean value for relative maturation status for the entire participant sample was significantly greater than the expected value by a moderate magnitude ($p < 0.001$, Cohen's D = 0.67). In contrast to the RAE, the maturation biases in each age cohort and across the total sample were considered not equivalent to the absence of bias.

**Table 5.1.** Descriptive statistics (Mean ± SD) for relative age and biological maturity status in the Irish football player pathway by chronological age and across the total sample.

Note the expected values for relative age and relative maturity Z-Scores are 0.5 and 0.0, respectively.

| Selection Cohort by Chronological Age Group | n | Relative Age | Percentage of Predicted Adult Height | Relative Maturity status (Z-Score) Mean ± SD |
|---|---|---|---|---|
| IRE13 | 125 | 0.59 ± 0.28[*] <br> D = 0.32 | 86.8 ± 2.7 | 0.49 ± 0.88[*] <br> D = 0.56 |
| IRE15 | 18 | 0.64 ± 0.28[*] <br> D = 0.5 | 96.1 ± 1.1 | 0.77 ± 0.41[*] <br> D = 1.85 |
| IRE16 | 16 | 0.64 ± 0.26[*] <br> D = 0.56 | 98.2 ± 1.0 | 0.62 ± 0.33[*] <br> D = 1.88 |
| Total Sample | 159 | 0.59 ± 0.27[*] <br> D = 0.36 | 89.0 ± 4.9 | 0.54 ± 0.80[*] <br> D = 0.67 |

[*]Denotes a significant difference between observed value and expected value.

D = Cohens D effect sizes

**Table 5.2.** Relative maturation status and birth quartile breakdown for the Irish boys' national player pathway, described by chronological age cohort and the total sample.

Presented are the total number of players and the percentage of the population in parenthesis.

| | | Irish talent squad | | | Total Sample |
|---|---|---|---|---|---|
| | | IRE13 | IRE15 | IRE16 | |
| | | n (% of cohort) | n (% of cohort) | n (% of cohort) | n (% of cohort) |
| Relative Maturation Status | Early | 58 (46.4%) | 13 (72.2%) | 10 (62.5%) | 81 (51%) |
| | On time | 51 (40.8%) | 5 (27.8%) | 6 (37.5%) | 62 (39%) |
| | Late | 16 (12.8%) | 0 (0%) | 0 (0%) | 16 (10%) |
| | Total | 125 (100%) | 18 (100%) | 16 (100%) | 159 (100%) |
| Birth Quartile | Q1 | 41 (32.8%) | 8 (44.4%) | 6 (37.5) | 55 (34.6%) |
| | Q2 | 36 (28.8%) | 6 (33.3%) | 4 (25%) | 46 (28.9%) |
| | Q3 | 31 (24.8%) | 1 (5.6%) | 4 (25%) | 36 (22.6%) |
| | Q4 | 17 (13.6%) | 3 (16.7%) | 2 (12.5%) | 22 (13.8%) |
| | Total | 125 (100%) | 18 (100%) | 16 (100%) | 159 (100%) |
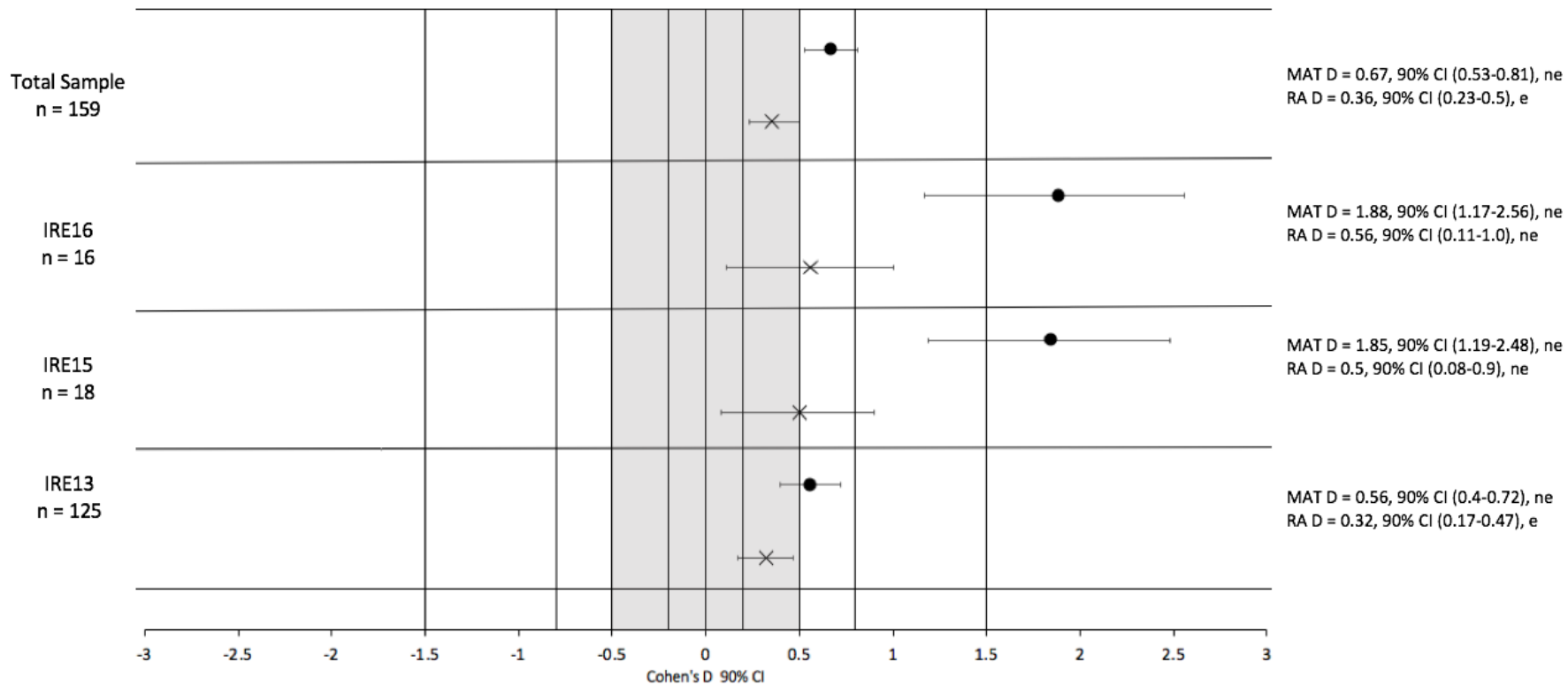
Figure 5.2. Cohens D effect sizes for the mean values for relative maturation status (Z-Score) and relative age by chronological age cohort and by total sample.

Note the equivalence band of ±0.5 Cohens D denotes the values that were and were not considered equivalent to the absence of bias.

RA = Relative age
MAT = Maturation Status
e = equivalent to the absence of bias
ne = not equivalent to the absence of bias
● = Cohens D Maturity Z-score (90% CI) x = Cohens D Relative age (90% CI)
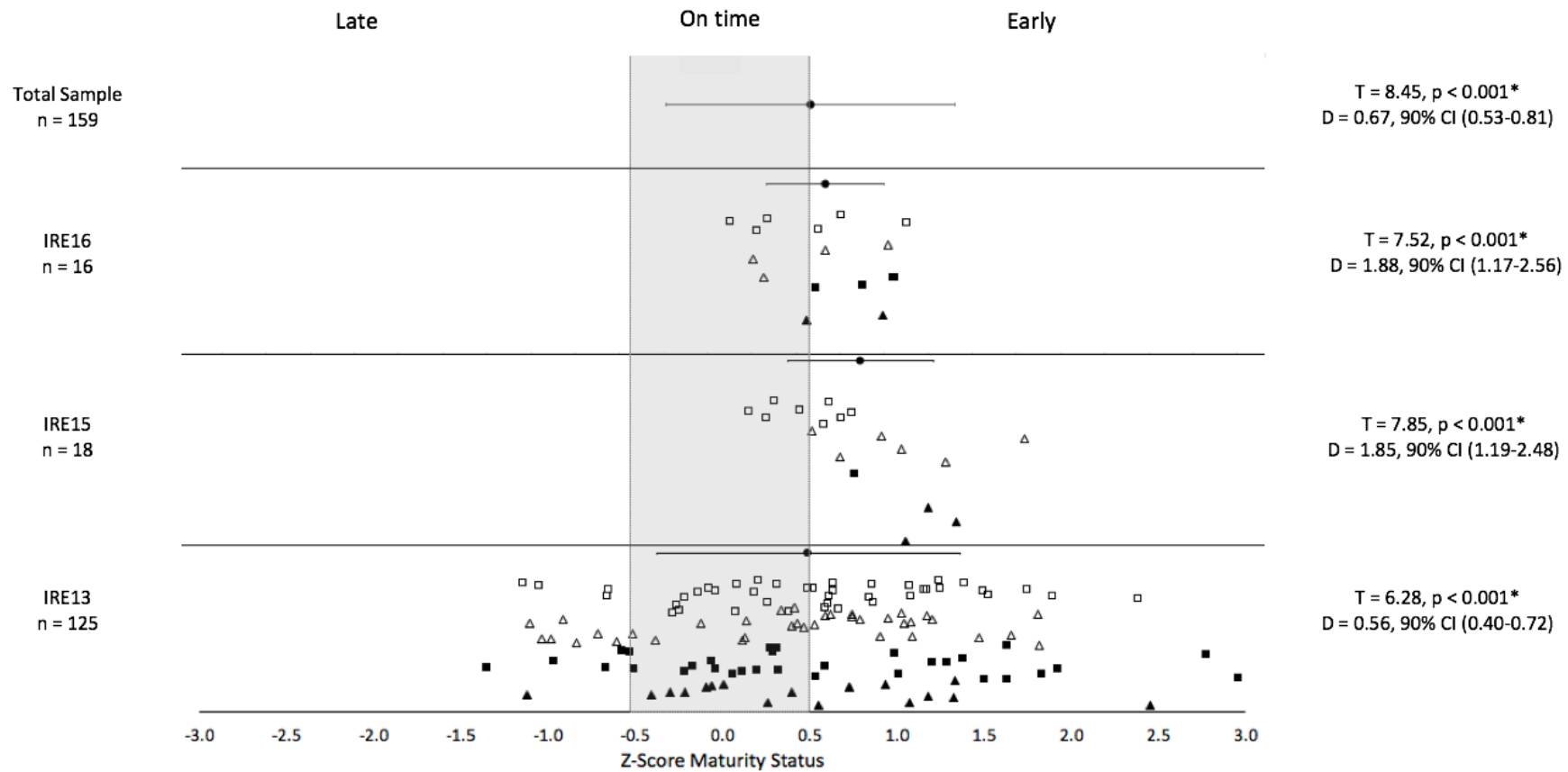
Figure 5.3. Maturity selection biases in the FAI's boys' national player pathway by age cohort and by total sample.

□ = BQ1
△ = BQ2
■ = BQ3
▲ = BQ4

● = mean maturity Z-score ± SD

* = Indicates a significant difference between observed mean value and expected mean value
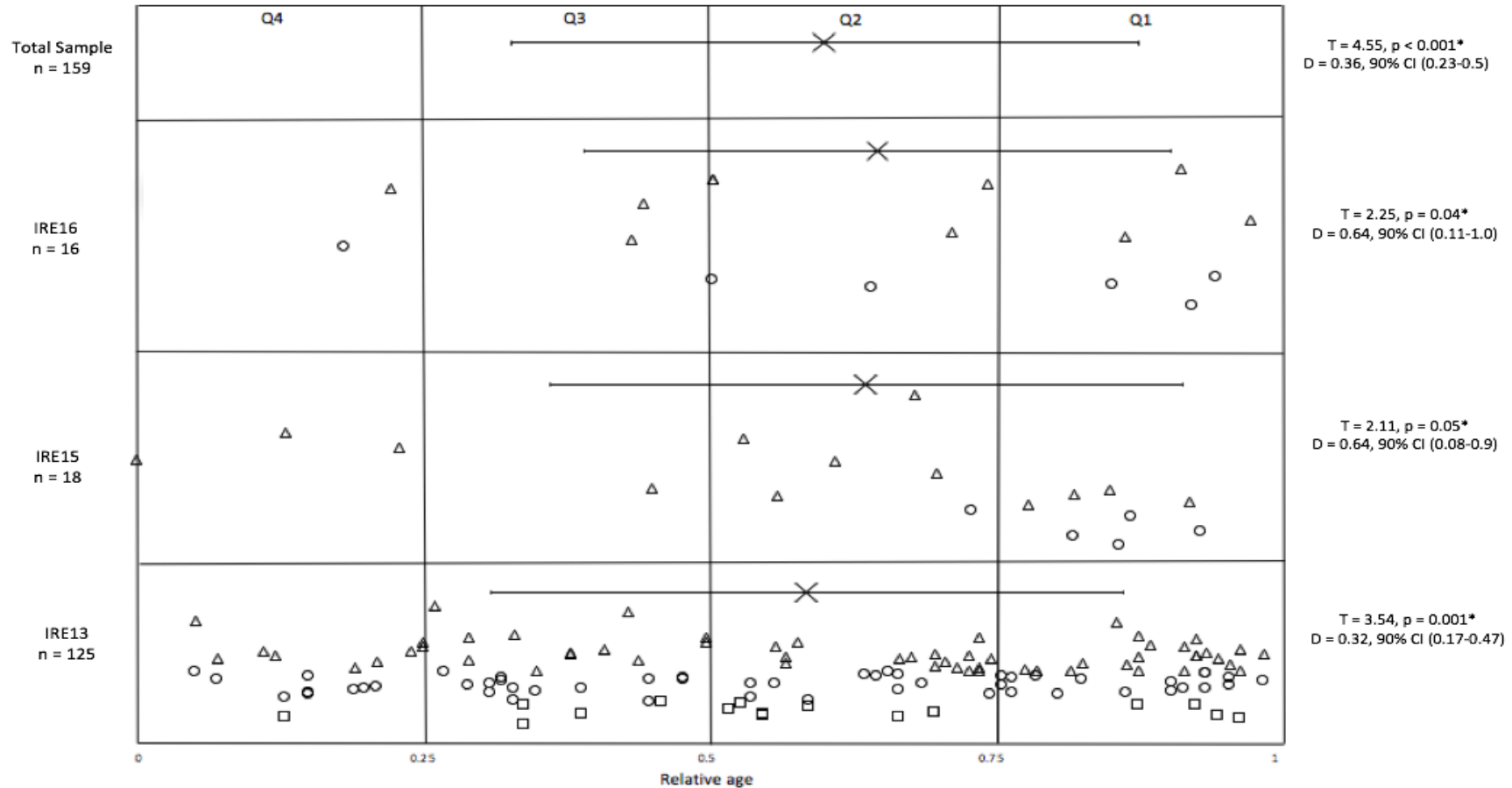
Figure 5.4. Relative age selection biases in the FAI's boys' national player pathway by age cohort and by total sample.

△ = Early

○ = On time

□ = Late

X = mean value for relative age ± SD

* = Indicates a significant difference between observed value and expected mean value

**5.3.2 Part 2: The Associations Between Biological Maturation and Relative Age**

Correlations among the variables of interest are presented in Table 5.3. There was a positive and significant correlation between absolute maturity status (percentage of predicted adult height) and relative age in IRE13, although the magnitude of this positive correlation was small ($r = 0.45$, $p = < 0.001$). However, there were no other statistically significant correlations between absolute maturity status and relative age across age groups. The correlation between relative age and maturity status relative to chronological age (Z-scores) demonstrated an inverse correlation in IRE15 ($r = -.77$, $p < 0.001$), but there were no other statistically significant correlations between relative maturity status and relative age across age groups or the total sample. The Chi-Square statistic revealed no statistically significant differences between the distribution of players by relative age and maturity status ($X^2$ (6) = 3.14, $p = 0.79$).

**Table 5.3.** Spearman correlations between relative age and absolute maturity status, and between relative age and maturity status relative to chronological age presented by age cohort and by total sample.

| Age cohort | Relative age vs. absolute maturity: Spearman's r | Relative age vs. maturity relative to chronological age: Spearman's r |
|---|---|---|
| IRE13 | .45 ($p < 0.01$)[a] | .43 ($p = 0.32$) |
| IRE15 | .15 ($p = 0.28$) | -.77 ($p < 0.01$)[b] |
| IRE16 | .21 ($p = 0.22$) | -.17 ($p = 0.26$) |
| **Total sample** | **.4 (weighted)** | **-.008 ($p = 0.46$)** |

[a] indicates a significant and positive correlation

[b] indicates a significant and inverse correlation

note: the weighted mean was calculated by multiplying the weight with the quantitative value associated with each age cohort and then adding all the products together.

## 5.4 Discussion

This research investigated the presence of biological maturation and relative age-associated selection biases within the FAI's national talent pathway. A selection bias in favour of early maturing players was observed across all age groups, increasing in magnitude with successive age groups. A RAE was also observed across all competitive age groups. In contrast to the maturation bias, the RAE was smaller in magnitude and did not increase with chronological age. Significantly, the results of this study provide further evidence that the RAE and maturation biases exist and operate independently of one another. The small to moderate associations observed between relative age and absolute maturation also support the contention that relative age should not be considered or treated as a proxy for biological maturation. That is, older age for one's age group does not necessarily imply more advanced maturation.

The observed selection bias in favour of early maturing players in the Irish player pathway was notably larger than those reported in comparable studies in professional academies (Hill et al., 2020). Proportionally, early maturing players were overrepresented across all talent squads with effect sizes ranging from moderate to very large. Early maturing males constituted 51% of the total sample (peaking at 72% in IRE15); a higher proportion of early maturing players than that seen in samples of English academy players (30% of the playing sample, peaking at 54%) using the same criterion to categorise maturity status (Hill et al., 2020). The national talent system in Irish football begins at age 12. When taking the mean values for maturation status as determined by Z-scores at this age cohort (0.49), Z-Scores within the Irish system were notably higher than those observed throughout previous literature (-0.04-0.33) (Cumming, Searle, et al., 2018; Hill et al., 2020; Johnson et al., 2017; Parr et al., 2020a; Ruf et al., 2021). As a direct consequence of this selection bias, no late maturing players were present in the Ireland under 15 and 16 international squads. A review of the current literature suggests that a football pathway with no late maturing players in these age cohorts

has only been observed in one other published investigation (Hill et al., 2020), although the relatively low proportion of late maturing players in these age groups is consistent across research (e.g., Cumming, Brown, et al., 2018; Cumming, Searle, et al., 2018; Hill et al., 2020; Johnson et al., 2017; Ruf et al., 2021). These findings have significant applied implications given that in the following age groups, competitive international tournament football and qualifying campaigns begin, starting with the Under 17 European Championships. Once excluded and denied exposure to the Irish international set-up, late maturing players are less likely to return to the system in the future (Hill et al., 2020; Johnson et al., 2017).

A RAE was also observed across all competitive age groups; however, the magnitude of this bias ranged from small to moderate. Mean values for relative age across the Irish pathway differed from the expected values for relative age by only a small degree. When examining the playing population in the Irish pathway by birth quartile (cf. Figure 5.4 and Table 5.2), the proportion of youth players born in the last two quartiles of the year is higher than those previously observed elsewhere (Brustio et al., 2018; González-Víllora et al., 2015; Hill et al., 2020; Lovell et al., 2015; Parr et al., 2020a), although the majority of Irish players were born in Q1 and Q2. Accordingly, one might argue that variance in maturation presents a greater influence on selection than variance in relative age within this particular sample. This view is consistent with the observations of Johnson et al. (2017) who noted that maturation served as a stronger predictor of selection than relative age in adolescent football players.

The findings of this study lend further support to the notion that the RAE and biological maturation exist and operate independently from one another. Firstly, the differing magnitude of each bias and how these biases did and did not increase over time provide a preliminary indication. A statistically significant RAE existed at a small to moderate degree and remained relatively stable with chronological age. Contrastingly, statistically significant biological maturation biases existed at a moderate to a very large degree and increased in magnitude with

chronological age. In addition, the correlational analysis demonstrated that relative age was predominantly unrelated to both absolute and relative biological maturation status. The higher magnitude of the maturation biases compared to the RAE can be explained by the fact that date of birth, at a maximum, can account for 0.99 years difference in the same chronological age cohort, whereas the effect of biological maturation can be as much as six years between players of the same chronological age (Borms, 1986; Johnson, 2015; Johnson et al., 2017). When examining the distribution of the total sample by relative age according to relative maturation status, although not statistically significant, only one Q4 born player was late maturing (0.63% of the population), whereas this value increased elevenfold in Q4 born players that were early maturing. This would suggest that late maturing players who are also Q4 born face a double disadvantage and are the least likely to be selected within the context under investigation. On the other hand, early maturation seems to have such a strong influence on *selection* that being born in Q3 and Q4 was not so much of a disadvantage in early maturing players. This observation presents an interesting paradox, as it is often assumed that a player born in the fourth quarter is late maturing, when in reality, they are disproportionately more likely to be early maturing in this sample. This is supported further by the inverse correlation between relative age and relative maturity status in IRE15 which demonstrates that selected players born later in the selection year were generally more mature for their age than those born earlier in the selection year (cf. Figueiredo et al., 2019).

The result of the present study also supports the contention that older relative age does not imply more advanced maturity. As illustrated in Figure 5.4, early and late maturing players were observed across all four birth quarters within the IRE13 pathway. Whereas biological maturation status, timing, and tempo (and thus, the associated biases of advanced biological maturation) are determined predominantly by genetic and a range of environmental factors (Cumming et al., 2017; Cumming, Searle, et al., 2018; Hill et al., 2020; Towlson et al., 2022),

the advantages associated with relative age are unrelated to these physical and physiological adaptations (Towlson et al., 2022). Indeed, this may explain why the RAE is also present in non-sporting domains such as education (Cobley, McKenna, et al., 2009; Thoren et al., 2016) or chess (Breznik & Law, 2016). In addition, this may also explain why the RAE is present in football academies from childhood (Lovell et al., 2015) but the bias towards early maturing players does not emerge until the onset of puberty (Hill et al., 2020; Johnson et al., 2017). The advantages associated with advanced relative age have been proposed to be a result of age and experiential differences that are present from early childhood (Hill et al., 2020; Parr et al., 2020a), although more recent evidence suggests that the phenomenon is more complex, and instead, is a population level consequence of a constellation of factors less measurable than biological maturation alone (McCarthy et al., 2022). These factors are explored in greater detail in Chapter 7. There is a need to make the independent nature of the RAE and biological maturation unequivocally clear to coaches and practitioners working within talent pathways, as these two concepts are often confused and incorrectly interpreted as synonymous (Towlson et al., 2022).

From a player development perspective, the results of this analysis clearly show that early maturing players are overrepresented on Irish national talent squads and youth international teams; a bias that increases in magnitude with chronological age. The magnitude of this bias is more prominent than the RAE. This investigation was the first to assess the maturation statuses of players at the national (and highest) level of the pathway, whereas previous investigations have tended to focus on academy/club players (a step lower in the pathway). Given that the maturation bias appears more pronounced at the national level than at the club level, this suggests that the magnitude of the selection biases not only increases with chronological age but may also increase with the level of competition.

Most importantly, talent identification and development are a biopsychosocial process, contextualised based on the interaction between physical and functional attributes, psycho-behavioural characteristics, and the socio-cultural environment in which the player exists (Bailey et al., 2010; Collins & MacNamara, 2019). Interventions targeted at managing the dynamics associated with maturation biases and the RAE require further investigation, but will inevitably require biopsychosocial considerations (e.g., routine monitoring, coach education, parent education, individualised development and competition, regular player assessment events, pathway coherence). These outcomes will be explored in further detail in Chapter 7.

## 5.5 Limitations

Several limitations of the current study should be noted. Firstly, the results are specific to the FAI's male national TD system and caution is urged when generalising the findings to other Football Associations' pathways, non-Irish clubs, or female player pathways. Second, parental heights for the prediction of adult height were self-reported, rather than measured, and subsequently adjusted for overestimation based on the equations outlined by Epstein et al. (1995); this formula is based upon participant samples from the United States. The percentage of predicted adult height at the time of observation was used as the indicator of biological maturity status using the regression formula and coefficients outlined by Khamis & Roche (1994, 1995). Again, this prediction equation is derived from samples of American youth of European ancestry enrolled in the Fels longitudinal study. Moreover, the Z-scores used to derive maturity status from the percentage of predicted adult height are calculated based on participants of European ancestry in the Berkeley Growth Longitudinal Study (Bayer & Bayley, 1960). The participant sample examined in this study consisted predominantly of European Caucasians.

It should also be noted that a large proportion of the sample derive from just one age cohort (IRE13). This is a real-world reflection of the nature of TD structures, whereby the talent pathway narrows upon the onset of puberty. Perhaps this structure contributes to the selection biases observed in this study, whereby early selection procedures and a narrowing of the talent pool is forced at a time point where the advantages associated with early maturation become prominent.

## 5.6 Conclusion

To conclude, this investigation has demonstrated that the RAE exists in the Irish player pathway at only a small-moderate degree, but the preferential selection of early maturing players exists at a moderate-very large degree; a bias that increases in prominence with chronological age. The small to moderate associations observed between relative age and absolute/relative maturation status also support the contention that relative age should not be considered or treated as a proxy for biological maturation. Findings suggest the need for the FAI to critically analyse and subsequently re-evaluate how young players are assessed, monitored, and selected for national talent programmes; the current system significantly diminishes the chances of selection for those who are late maturing biologically. The practical implications of these findings in the Irish football context are discussed in section 9.3.3 in Chapter 9.

# Chapter 6: The Selection Advantages Associated with Advanced Biological Maturation Vary According to Playing Position in National-Level Youth Football.

Sweeney, L., Cumming, S., MacNamara, Á., & Horan, D. (2023). The selection advantages associated with advanced biological maturation vary according to playing position in national-level youth soccer. *Biology of Sport*. https://doi.org/10.5114/biolsport.2023.119983

## 6.1 Introduction

Chapter 5 identified the moderate to very large selection biases that are evident in favour of early maturing players across the FAI's national TD system. These selection biases increased in magnitude with chronological age and the level of competition. As a result, the systematic exclusion of late maturing players across the pathway was evident, and no late maturing players remained in the FAI's national system by age 14-15 years. In contrast, the proportion of early maturing players within selected cohorts peaked as high as 72%. The trend of these findings is consistent with previous literature within football academies (e.g., Hill et al., 2020; Johnson et al., 2017). Whilst a RAE was also observed in Chapter 5, this was found to be much smaller in magnitude than the selection biases associated with advanced biological maturity. In addition, RAE's remained relatively stable across chronological age groups. In this regard, biological maturation selection biases are notably larger at the population level than RAE's in the FAI's male national TD system. However, despite our increasing understanding of the role of biological maturation on talent identification and development in youth football, there is a scarcity of research that has investigated how variations in maturation differ between players

of different playing positions. It would seem logical to presume that the techno-tactical and physical requirements of specific playing positions influence how players at different stages of biological maturation are perceived by coaches.

Malina et al. (2000) investigated how variations in skeletal maturation influenced selection in national-level youth footballers by playing position and found that forwards were the most advanced, followed by defenders and then midfielders. However, the participant sample was small (n = 17) and aged only between 15-16 years, and players were broadly categorised as either defender, midfielder or forward (goalkeepers excluded). In contrast, using the same positional categorisations, other authors have found differences in skeletal maturation between selected regional-level youth players to be negligible (Coelho e Silva et al., 2010). Regardless, these positional categorisations fail to recognise the distinct physical, technical, and tactical variations between players of the same broad playing position (e.g., full-backs vs. central defenders, central defensive midfielders vs. central attacking midfielders). More research is required to understand how variance in biological maturation influences selection between specific playing positions in youth footballers using larger participant samples, more specific positional categorisations, and a broader range of age groups.

Investigating how maturation biases vary according to playing position would help to further support the talent identification and development process by allowing clubs and coaches to identify in which positions the physical and physiological advantages associated with advanced maturation are most influential on selection. These findings may help to support the provision of effective strategies to help to retain talented, yet later maturing players within a given Football Association. With consideration to the previous discussion and reflecting the sixth aim of this thesis outlined in Chapter 1, the purpose of this investigation was to examine the variations in biological maturation between different playing positions in national-level youth footballers in the FAI's national TD system.

## 6.2 Methods

### 6.2.1 Participants

The participants under investigation were the same as those outlined in section 5.2.2 of Chapter 5. Each parent/guardian and player received an information leaflet outlining the purpose of the research study and provided written informed consent before data collection. Ethical approval was granted by the Dublin City University Research Ethics Committee.

### 6.2.2 Biological Maturity Status

The methods used to obtain and estimate biological maturity status, the equation used to adjust for the overestimation of self-reported parental heights, the Z-score criterion used to classify players as early, on-time and late maturing, and the equipment used to measure the anthropometric variables of the players are the same as those outlined in section 5.2.4 of Chapter 5.

### 6.2.3 Playing Position

Players were categorised as goalkeepers (n = 17), full-backs (n = 22), central defenders (n = 20), central defensive midfielders (n = 17), central midfielders (n = 30), central attacking midfielders (n = 12), wide midfielders (n = 23), and centre forwards (n = 18). Indeed, whilst recognising that youth players of such ages (12-16 years) are encouraged to be flexible and perform in several playing positions and tactical formations, for the purpose of this investigation, corroboration took place with each players' national head coaches in which the players' 'best' position was chosen, which was subsequently assigned to the player for the analysis. Throughout underage national TD structures, the FAI use consistent positional categorisations across age groups. The specific positional categorisations in this study were

selected to match the consistent positions adopted by the FAI underage national TD coaches/structures.

### 6.2.4 Data Analysis

Data were analysed using SPSS Version 27. Descriptive statistics were used to examine the variance in biological maturation status relative to chronological age (Z-Scores) across playing positions. Given the unequal sample sizes across different playing positions, a non-parametric Kruskal-Wallis test was used to evaluate group differences. Post-hoc comparisons were determined by the Bonferroni technique (0.05 was used for statistical significance). A series of one-sample means t-tests (one-tailed) were also used to examine the degree to which relative biological maturation selection biases existed across each playing position by comparing the observed mean values for relative biological maturation (Z-Score) against the values expected for the general population (0.0). Subsequent tests of equivalence were used to determine the magnitude of any biases and the degree to which any biases were or were not equivalent to the absence of bias. A 90% confidence interval that existed within the ±0.5 Cohens D equivalence band was accepted as equivalent to the absence of bias, as outlined in section 5.2.6 of Chapter 5. Effect sizes (Cohens D) were used to examine the magnitude of any significant differences (small = 0.2–0.49; moderate = 0.5–0.79; large = 0.8-1.19; very large = ≥1.2) (Sawilowsky, 2009).

## 6.3 Results

The results of the one-sample mean t-tests to examine the presence of maturity selection biases by playing position are presented in Table 6.1. The mean value for relative maturation was

significantly greater than the expected value for goalkeepers, central defenders, full-backs, centre midfielders, wide midfielders, and centre forwards ($p < 0.05$) (Figure 6.1). The magnitude of the statistically significant maturation biases ranged from small to very large (Cohens D = 0.49–1.65) (Figure 6.2). Each significant maturation bias was considered not equivalent to the absence of bias in the one-sampled mean t-tests. The result of the Kruskal Wallis analysis indicated that there was a significant difference in relative maturation status across playing positions (H (7) = 19.31, $p = 0.007$). Subsequent pairwise comparisons showed that central defenders were significantly more mature for their age than centre attacking midfielders ($p = 0.011$), defensive midfielders ($p = 0.027$) and full-backs ($p = 0.019$). There were no other significant differences between positions.

**Table 6.1.** Descriptive statistics (Mean ± SD) for relative biological maturity status in the Irish football player pathway by playing position.

Note the expected values for maturity Z-Scores for the general population are 0.0.

| Playing position | n | Maturity Z-Score Mean ± SD | Cohens D (90% CI) | Magnitude of the selection bias |
|---|---|---|---|---|
| Goalkeeper | 17 | 0.62 ± 0.90* | 0.70 (0.24-1.13) | Moderate |
| Central defender | 20 | 1.07 ± 0.65* | 1.65 (1.06-2.20) | Very large |
| Full-Back | 22 | 0.32 ± 0.66*† | 0.49 (0.11-0.85) | Small |
| Central defensive midfielder | 17 | 0.25 ± 0.70† | 0.36 (-0.06-0.77) | No significant difference |
| Central midfielder | 30 | 0.48 ± 0.77* | 0.62 (0.29-0.94) | Moderate |
| Central attacking midfielder | 12 | 0.07 ± 0.75† | 0.09 (-0.34-0.56) | No significant difference |
| Wide midfielder | 23 | 0.62 ± 0.80* | 0.78 (0.38-1.16) | Moderate |
| Centre forward | 18 | 0.69 ± 0.91* | 0.76 (0.31-1.19) | Moderate |
| Total sample | 159 | 0.54 ± 0.80* | 0.67 (0.53-0.81) | Moderate |

*Denotes a significant difference between the observed value and expected value.

†Denotes a value significantly less than the value observed for centre defenders.
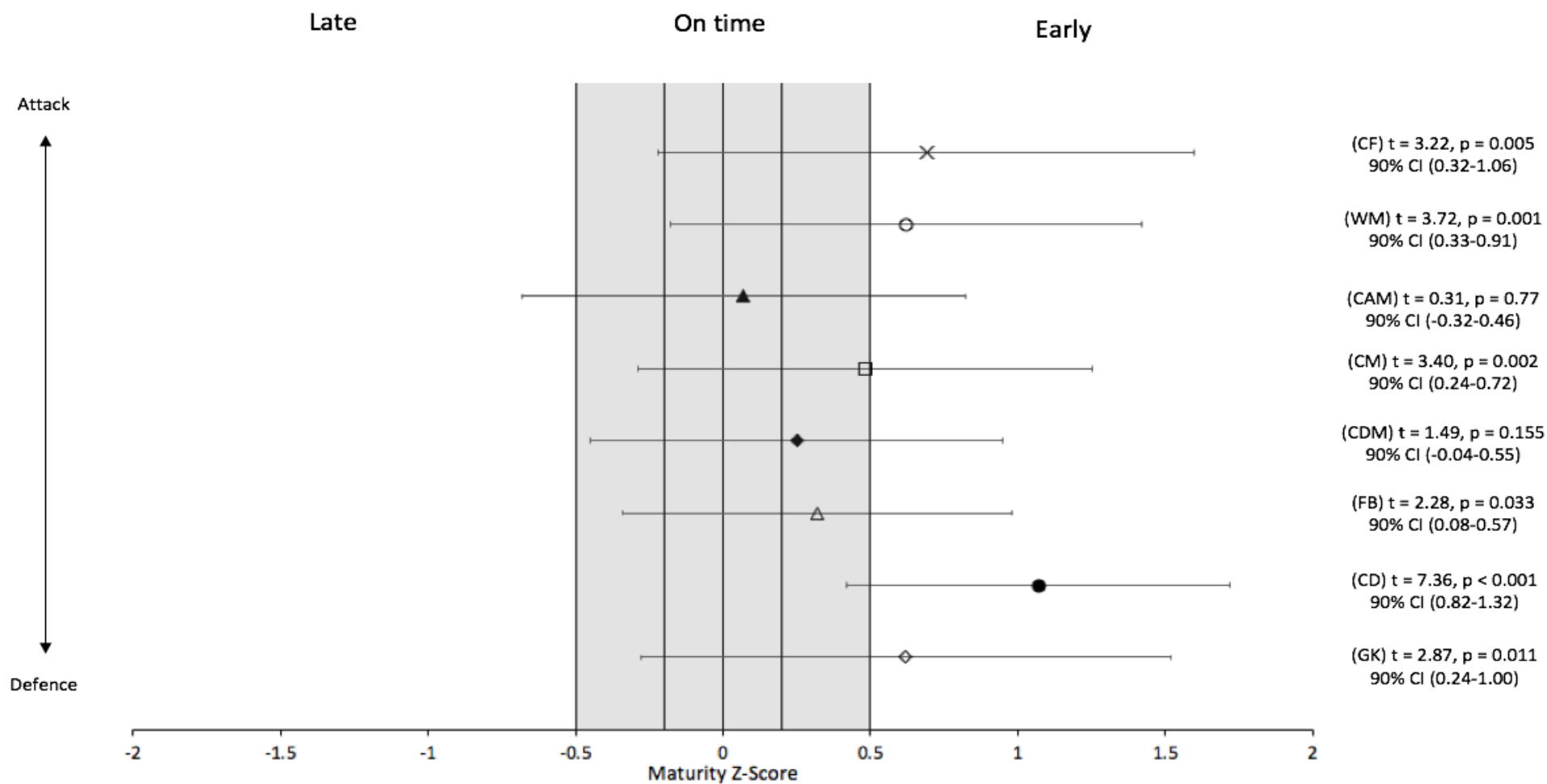
Figure 6.1. Maturity selection biases by playing position from the series of one-sample means t-tests.

Data presented as Mean ± SD maturity Z-score for each position.

GK = Goalkeeper        FB = Full-back        CM = Central midfielder        WM = Wide midfielder

CD = Central defender    CDM = Central defensive midfielder    CAM = Central attacking midfielder    CF = Centre forward
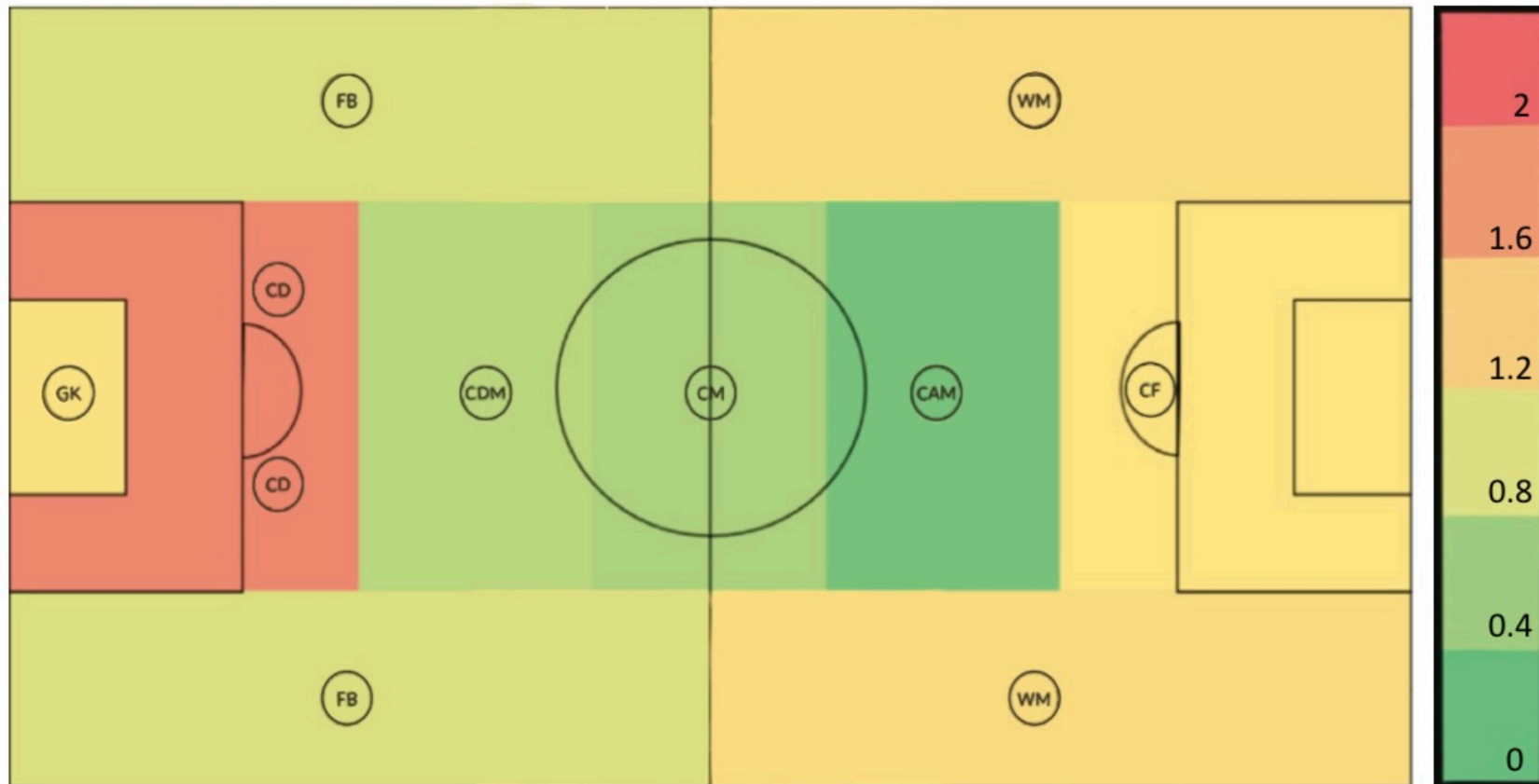
Figure 6.2. Cohens D effect sizes for the mean values for relative maturation status (Z-Score) by playing position on the football field, attacking from left to right.

Note the green value denotes a lower effect size and thus a lower selection bias in favour of early maturation, whereas red denotes a higher effect size and a larger selection bias. The scale denoting the effect size ranges (Cohens D) is displayed to the right.

GK = Goalkeeper         FB = Full-back         CM = Central midfielder         WM = Wide midfielder
CD = Central defender     CDM = Central defensive midfielder     CAM = Central attacking midfielder     CF = Centre forward

## 6.4 Discussion

The purpose of this study was to investigate variations in biological maturation in national-level youth footballers of different playing positions in the FAI's national TD system. When taking the mean values for relative maturation status by position, a selection bias in favour of earlier maturation existed for goalkeepers, central defenders, full-backs, central midfielders, wide midfielders, and centre forwards with effect sizes ranging from small to very large. In contrast, biological maturation selection biases were not observed for central defensive midfielders or central attacking midfielders. Controlling for differences in sample size, central defenders were significantly more mature than central attacking midfielders, central defensive midfielders and full-backs, with no other significant differences observed between positions.

Although there is a lack of existing studies to directly compare to the current investigation, Malina et al. (2000) investigated variations in maturation status according to outfield playing position, noting forwards and defenders to be more mature than midfielders, with forwards being the most advanced. These findings were not replicated in the present study. Central defenders were the most biologically advanced, with a Z-Score notably higher than those observed for centre forwards (1.07 vs. 0.69). Central defenders were also significantly more advanced in maturation than two of the three midfield playing positions (central defensive and central attacking midfielders). Importantly, direct comparisons to the findings of Malina et al. (2000) are done so with caution given the differences in sample sizes examined (17 vs. 159) and the number of different playing positions (3 vs. 8) analysed. It is equally important to note that the current sample represented a very select group of players that had been identified as the most able within a specific nation and, as such, greater selection pressures or a particular preference for style of play may have influenced the nature of the results. In line with the findings of this study, defenders have also been observed as the most mature players within a

similar sized sample of French academy players, although differentiation between full-backs and central defenders was also not conducted (Carling et al., 2012).

At the youth level, players advanced in maturation typically perform more high-intensity actions (running $\geq$ 1s at >19 km.h$^{-1}$), repeated high-intensity actions, and attain faster peak speeds during football match-play (Buchheit & Mendez-Villanueva, 2014). In addition, early maturing boys are generally taller and have greater muscle mass and strength (Brown et al., 2017). It is, therefore, unsurprising that the maturation biases are more pronounced in the outfield positions in which many of these physical characteristics are most desirable. Central defenders were the most biologically advanced in this sample. Indeed, defenders were also amongst the most mature players selected in similar samples (Carling et al., 2012; Malina et al., 2000). This is likely due to the technical-tactical positional requirements in which greater size/stature and strength (e.g., to compete in aerial duels) is highly desirable in this position. During elite-level match-play, sprinting is the most frequent action in goal-scoring situations (Faude et al., 2012). As advanced maturation is associated with increased levels of testosterone and maturation of the anaerobic system (Beunen et al., 2006; Hibberd et al., 2014), this may explain why the centre forwards and wide midfielders (the most offensive positions) selected are amongst the most mature players. Central defenders, centre forwards and wide midfielders had mean Z-Scores between 0.62-1.07, demonstrating a moderate to very large maturation bias (Cohens D = 0.76-1.65). As well as being taller and having greater muscle mass and strength, early maturing boys are generally heavier and have greater fat mass (Brown et al., 2017; Buchheit & Mendez-Villanueva, 2014). As body size dimension is proposed as one of the most important prerequisites to becoming a professional goalkeeper, this may explain the extent of the maturation bias observed for goalkeepers (Deprez et al., 2015).

The selection biases in favour of early maturing players within the FAI's national TD system were identified in Chapter 5, with a selection bias apparent at age 12 and increasing in

magnitude with chronological age and the level of competition. Results from this study demonstrate that the magnitude of these selection biases is also heavily influenced by playing position. It has previously been suggested that maturation biases may be the most prevalent in the central positions (Hill et al., 2020), but these results do not directly support this hypothesis. Interestingly, wide midfielders and full-backs were generally early maturing and more biologically advanced than both central attacking and defensive midfielders.

During senior-level match-play, central attacking midfielders have been shown to compete in the lowest number of aerial duels but spend the most time in possession of the ball and have the highest number of ball possessions with a role focussed on linking midfield and attack (Dellal et al., 2010). Likewise, central defensive midfielders have a role focussed on building passing sequences, with less emphasis on sprinting and high-speed running metrics compared to the other midfield/offensive positions (Dellal et al., 2010; Wu et al., 2020). Given that the physical and physiological advantages associated with early maturation (e.g., increased lean muscle mass, power, strength, anaerobic metabolism) are not primary technical-tactical components of central attacking and defensive midfielders, this may explain why early maturation biases are not observed in these positions. However, it is important to note that the extent of the total, high-intensity and sprinting distances performed by players of each position during match-play is highly variable and context-dependent (e.g., influenced by formation, score-line, minute of match-play, environmental conditions). Additionally, a small selection bias in favour of early maturing players was observed in full-backs, although full-backs were significantly less mature than central defenders.

In this sample of national-level youth footballers, selection biases in favour of early maturing players were shown to exist in some, but not all, playing positions. Nevertheless, mean Z-scores for each position were positive values ($\geq 0.07$). These results suggest that late maturation does appear to be a negative selection factor in all positions, especially for central

defenders and centre forwards. By only selecting early maturing players for specific playing positions, a large proportion of the available pool of talent to select from is reduced (Johnson et al., 2017). Given that all players reach full biological maturity by adulthood, and therefore, senior levels of performance, the effects of advanced biological maturation will no longer be present by this point. Yet, the evidence presented in the previous two chapters suggests that late maturing players are no longer in the FAI's national TD system by age 14-15 years. This has significant implications, as many late maturing players may hold the potential to be successful at the senior level (e.g., Ostojic et al., 2014). However, reflecting on the discussion presented in Chapter 2, talent identification is a difficult and complex process for coaches and even the best performing adolescent footballers often do not attain elite-level senior status (e.g., Güllich, 2014; Herrebrøden & Bjørndal, 2022; Schroepf & Lames, 2018), demonstrating the complex, dynamic and non-linear nature of development (Abbott et al., 2005; Abbott & Collins, 2004; Collins & MacNamara, 2012). The selection and development dynamics associated with biological maturation will be explored further in the following chapter.

## 6.5 Limitations

Whilst recognising that dividing players by eight playing positions rather than three reduces the sample sizes within each position, these positional categorisations provide a more sensitive measure to examine maturation given the large variations in the technical-tactical (e.g., aerial duels, forward passes, crosses) and physical (e.g., high-speed running distance, sprint distance, number of accelerations and decelerations) demands between players in different positions (e.g., full back vs. central defender, attacking midfielder vs. defensive midfielder). Indeed, the overall sample size within this study is larger than similar studies conducted previously (Carling et al., 2012; Coelho e Silva et al., 2010; Malina et al., 2000). This investigation was

conducted with national-level youth footballers and provides a contextualised assessment of maturation biases according to playing positions in a high-profiled national TD setting.

In line with the limitations addressed in section 5.5 of Chapter 5, several methodological limitations must be addressed. Firstly, parental heights for the prediction of adult height were self-reported and adjusted for overestimation using equations based upon participant samples from the United States (Epstein et al., 1995). The percentage of predicted adult height at the time of observation was used as the indicator of biological maturity status using the regression formula and coefficients outlined by Khamis and Roche, which was derived from samples of American youth of European ancestry (Khamis & Roche, 1994, 1995). The Z-scores used to derive maturity status from the percentage of predicted adult height are calculated based on participants of European ancestry (Bayer & Bayley, 1960). The limitations of these methodological approaches are discussed in further detail in Chapter 7.

## 6.6 Conclusion

This study investigated how variations in biological maturation influenced the selection of national-level youth footballers in the FAI's national TD system according to playing position. The findings indicated that central defenders were significantly more mature than full-backs and central defensive and attacking midfielders. Moreover, selection biases in favour of advanced maturation existed for goalkeepers, central defenders, full-backs, central midfielders, wide midfielders, and centre forwards, although the magnitude of this bias ranged from small to very large. Selection biases did not exist for central defensive and attacking midfielders. This study supports the contention that maturation selection biases exist in youth football, but the magnitude of this bias is significantly dependent upon playing position. The practical implications of these findings in the Irish football context are discussed in section 9.3.3 in Chapter 9.

# Chapter 7: Push and Pull Factors: Contextualising Biological Maturation and Relative Age in Talent Development Systems

## 7.1 Introduction

The previous two chapters have demonstrated the extent to which biological maturation and relative age influence selection and development dynamics within national-level male Irish U13-U16 youth footballers. Whilst relative age and biological maturation are often incorrectly interpreted as synonymous (cf. Towlson et al., 2022), findings from the previous two chapters show how these two factors exist and operate independently, altering selection dynamics in different ways and at different developmental stages, varying in magnitude over time. Indeed, a recent qualitative study suggested that the RAE may be a population-level consequence of a constellation of factors (e.g., age and experiential differences such as event-specific knowledge and understanding or behavioural development (Towlson et al., 2022)) less measurable than maturation alone (McCarthy et al., 2022). Related to this thesis, Chapter 5 and 6 showed how, in the Irish player pathway, a small-to-moderate selection bias in favour of relatively older players existed, remaining relatively stable with chronological age. In contrast, moderate-to-very large selection biases existed in favour of early maturing players, increasing in magnitude with successive age groups. These trends are consistent with previous football-specific investigations (e.g., Hill et al., 2020; Johnson et al., 2017).

In respect to the RAE, much of the extant literature has emphasised the negative effects of chronological age groupings at the point of selection (e.g., Kelly et al., 2021; Mann & van Ginneken, 2017). Indeed, the consensus has been that there is the need to eradicate the RAE through developmental interventions (Roberts et al., 2021) to prevent large numbers of relatively younger athletes from being excluded from talent systems (Cobley et al., 2009). Perhaps as a result of this emphasis, comparatively limited attention has been paid to the significant dropout of athletes in later selection cohorts (McCarthy et al., 2022) and the theoretical underpinnings of the RAE (Hancock et al., 2013). Similar to relative age, maturation-related selection biases are also generally viewed as something to eradicate (cf. Hill et al., 2020) as a means of widening developmental opportunities for later maturing athletes. The desire for eradication, however, does not have as simple a solution.

Given the impact of relative age and biological maturation on the selection and development of young athletes, a key practical question across TD systems and contexts is how these dynamics should influence practice. Traditionally, in respect to relative age and biological maturation, research and practice has tended to focus on the relative make-up of selection cohorts within TD systems and the impact of each concept on current performance status (e.g., Buchheit & Mendez-Villanueva, 2014; Hill et al., 2020; Johnson et al., 2017; Parr et al., 2020a). Notably lacking, however, are discussions surrounding how these two concepts can be contextualised within the range of complex biopsychosocial factors that impact long-term development at the individual level. Reflecting these limitations and the seventh aim of this thesis outlined in Chapter 1, this chapter aims to contextualise relative age and biological maturation more broadly in TD systems and subsequently offer ways in which talent systems may choose to engage in challenge management strategies. As outlined in Chapter 2, a developmental challenge in a TD context is an experience perceived by a performer to have the potential of disrupting development and/or performance in sport (cf. Collins et al., 2019).

Challenge dynamics are, therefore, the complex biopsychosocial factors that influence an individual's experience of and interaction with challenge (Nash & Taylor, 2021).

This chapter will begin by critically evaluating the various strategies that have been suggested to 'counter' the effects of biological maturation and relative age, before considering the broader range of challenge factors in TD. Building on this argument, I will conclude the chapter by suggesting ways forward for talent systems regarding the management of these concepts.

## 7.2 Interventions Targeted at Equalising Selection

Building on the assumption that the RAE and maturation biases are representative of systemic selection error and, therefore, are something to solve (e.g., Cobley et al., 2009; Mann & Van Ginneken, 2017), multiple interventions have been suggested to 'level the playing field' and counteract their selection biases in youth sports. This review will begin by critically evaluating these interventions.

### 7.2.1 Selection Interventions Aimed at the RAE

The first category of interventions predominantly views the RAE as the result of selection error, with a disproportionate population of relatively older athletes being given opportunities in talent systems. One intervention proposed to resolve this is age-ordered shirt numbering (Mann & van Ginneken, 2017). This intervention requires the number on the back of each player's shirt to correspond with their order of relative age (in football, for example, the oldest player would wear number one and the youngest would wear number eleven) so that the ascending relative age order of each player is explicitly displayed to coaches during match-play, training, and assessments. Although suggested to eliminate the selection biases associated with the RAE

in youth football (Mann & van Ginneken, 2017), research is yet to be conducted to provide evidence to support the long-term validity or efficiency of age-ordered shirt numbering concerning either talent identification or development. By making relative age the focal point in the selection process, this strategy also seems to incorrectly view relative age as conferring universal advantage or disadvantage. Indeed, Mann & van Ginneken (2017, p. 788) state that the intervention:

'May help coaches to provide more age-appropriate coaching and instructions so that it is tailored to each player's expected skill level based on their age and/or maturation. Second, the age ordered shirt numbering could even help to make the individual players more aware of the differences in skill that should be expected as a result of their relative differences in age'.

If deployed in this manner, this assumption is ill-founded. In reality, those born at the start of the selection year can still be significantly disadvantaged relative to peers based on other factors (Hill et al., 2020; Johnson et al., 2017; Towlson et al., 2022). As one example, Chapter 5 demonstrated that relatively older players in the Irish under 15 national team were less biologically mature than their relatively younger counterparts. Put simply, challenge dynamics cannot be assumed on the basis of a single variable. Moreover, despite being advocated as an intervention that also influences biological maturation (Mann & van Ginneken, 2017), Chapter 5 has demonstrated that the RAE and maturation are two independent constructs and an intervention targeted at mitigating one will not have a direct impact on the other (Hill et al., 2020; Johnson et al., 2017; Towlson et al., 2022). It is also important to acknowledge that the inter-individual differences in relative age between players (a non-linear ascending function) cannot be accounted for using the linear ascending function of shirt numbers (Mann & van Ginneken, 2017).

From a statistical standpoint, Cobley et al. (2019) designed a corrective adjustment procedure using longitudinal reference data from swimming performance metrics that were shown to remove the RAE in Australian state and national-level swimmers. Such corrective adjustments were calculated by generating accurate estimates of the relationship between decimal age and swimming performance based on repeated years of longitudinal cross-sectional performance data as a reference. When correctively adjusted swim times were examined, RAEs were absent across age-group and selection levels. Similar corrective adjustments have been utilised in athletics, with the suggestion that pre-existing RAEs can be effectively removed from all performance levels with such formulae (Romann & Cobley, 2015). Although an interesting proposition, it is likely that (even if validated, effective and supported with longitudinal data) such a method would be limited to centimetres, grams, and seconds (CGS) sports (e.g., running, swimming, cycling) and is likely ineffective in sports where there are broader internal and external influences on performance outcomes (i.e., team sports, racquet sports). This is not to suggest that relative age strongly influences physical and functional performance in youth athletes, but rather that it is more difficult to control for the broader variety of confounding factors that influence performance outcomes in team and racquet sports, as opposed to the comparatively fewer in CGS sports. If such a corrective adjustment procedure were to be considered, it would be important to first identify the associations between relative age and performance in a given context before correcting for them. In addition, the second-order effects of levelling the challenge landscape are unknown, especially as challenge dynamics are experienced at the individual level and periods of high and low challenge appear desirable (Taylor & Collins, 2019, 2021).

Several other interventions have been put forward to counteract RAEs. The establishment of quotas, where talent systems are required to select a minimum number of athletes from each birth quartile, has been suggested (Bennett et al., 2019; Helsen et al., 1998).

Another similar approach is an average age team rule, where the average age of the team is one-half of the age group range (Helsen et al., 2000). To date, however, and reflecting general limitations in TD research, there is a paucity of longitudinal data to support the impact of these inventions both on selection and, perhaps more importantly, on long-term development. By implementing these approaches, the RAE will be reduced and the number of athletes from each birth quartile will be more evenly distributed. Yet, a consequence of enforcing selection based purely on date of birth is that it removes the flexibility for coaches to make selection and deselection decisions based upon other biopsychosocial factors. Moreover, these structural approaches may remove the flexibility for the individual approach that might be required based on the unique set of circumstances in which an athlete finds themselves (e.g., play up or down). Indeed, all these approaches suffer from the assumption that the cause for disproportionate selection cohorts is a result of biased decision making. This perspective is focused on talent 'identification' and the need to select the 'right' people (Baker et al., 2018) but resultantly misses the broader picture of developmental dynamics that influence the route to selection and beyond (McCarthy et al., 2022). It may be based on this perspective that no interventions have been sought to address the significant deselection of early born athletes, compared to their relatively younger peers (Andrew et al., 2022; Kelly et al., 2021).

### 7.2.2 Selection Interventions Aimed at Biological Maturation

Similar to the age-ordered shirt numbering intervention proposed to mitigate the selection biases associated with the RAE (Mann & van Ginneken, 2017), player labelling has been suggested as a solution to overcome the selection biases associated with advanced biological maturation (Lüdin et al., 2022a). Player labelling requires the number on the back of each player's shirt to correspond to the ascending order of players by maturity status. In practicality, during football training or competition, the most mature player would wear number one and

the least mature player would wear number eleven so that coaches and scouts are aware of the variations in maturation status between players. When player labelling has been adopted in Swiss youth football, scouts at the regional level were shown to be less likely to rank the more biologically mature players as those with the most potential and, instead, were more likely to select the less mature players (Lüdin et al., 2022a). Crucially, however, when player labelling was not adopted (e.g., coaches were not provided maturation details of the players), there was no maturation selection bias in favour of either population (Lüdin et al., 2022a). By making biological maturation the sole focus in selection processes, and by incorrectly perceiving maturation status as conferring universal advantage or disadvantage, this intervention may create selection biases in favour of late maturing players based upon one single variable. Much like age-ordered shirt numbering, player labelling is also still in its relative infancy and no research has been conducted to produce findings to support the long-term validity or efficiency of the intervention concerning selection or development. Moreover, the inter-individual differences in maturation status between players (a non-linear ascending function) cannot be accounted for using the linear ascending function of shirt numbers (Lüdin et al., 2022a). Although providing coaches with visual cues to indicate the individual maturation statuses of the athletes within their care provides a progressive step forward from pre-existing methods, it is likely that the utility of such an intervention will remain limited without the provision of coach education within this domain. Ongoing educational support for practitioners in growth and maturation would help to support staff to support individual players based upon their physical needs and strengthen the utility of such interventions.

## 7.3 Interventions Targeted at Levelling the Developmental Playing Field

Although with some overlap with selection interventions, and depending on how strategies are deployed, a second broad group of strategies have been designed to address not only selection biases, but also the developmental dynamics experienced by athletes.

### 7.3.1 Developmental Interventions Focused on Relative Age

The second block of interventions have centred on presenting athletes with varying challenge levels and the opportunity to compete in different chronological age bandings. One such strategy is Birthday Banding, which aims to provide a range of developmental experiences in training and competition, where athletes move up to their next birthdate group on their birthday to remove fixed selection points and chronological age groups (Kelly et al., 2020). Under these conditions, an athlete can experience being the relatively youngest and oldest over a year, something that is proposed to confer a more diverse developmental experience. In one study, Birthday Banding was found to contribute to an insignificant RAE in a national squash TD system (Kelly et al., 2020). Although this is unlikely to be *the* single cause, it does suggest that this strategy can have a significant impact on the challenge level across a population. However, given the nature of challenge dynamics (Taylor et al., 2022b) and the advantages that variations in challenge levels offer (cf. Taylor & Collins, 2020), Birthday Banding may remove the flexibility that might be required for the individual. For example, although some players may be of the chronological age to move up an age group, they may not have the psychosocial maturity or technical-tactical competency to cope with the challenge of the higher age group. In this sense, if such a policy is to be effective, flexibility within a TD system is required to

allow coaches and practitioners to account for the individual developmental needs of each child and make such decisions (e.g., keep a player down an age group, move a player up before their birthday) on an individual basis. In addition, there may be maladaptive consequences for the application of Birthday Banding in team sports with significant turnover of groups and the consequent challenges of coherence and social dynamics. On the other hand, Birthday Banding may present one relatively low-resource intervention to provide fluctuations in challenge levels in individual sports. Given that it appears desirable for periods of both high and low challenge to be pulsed through a pathway (Taylor & Collins, 2020), Birthday Banding may offer a window into how challenge dynamics might be manipulated.

A comparable strategy is the rotation of selection cut-off dates to reduce the number of relatively older athletes selected into the TD system (Helsen et al., 2012). Similarly, Hurley et al. (2001) proposed the Relative Age Fair Cycle, in which the cut-off dates for each year of competition are changed by three months between seasons of competition so that athletes experience being in all four quartiles of the year throughout development. The advantage of this approach again seems to be the variety in competitive level faced by athletes. Yet, the implementation of such interventions seems to pose a variety of complex problems, requiring significant restructuring and potentially hindering coherence.

Another proposition to counter the RAE has been to delay selection until 15–16 years of age (Cobley et al., 2009). Critically, this proposition fails to take account of the dynamics that are at play regardless of selection into a talent system and how these might impact development. Indeed, there are NGBs that do not begin selection processes until these ages, and the RAE is still present in these systems upon selection (e.g., Kelly et al., 2021). As addressed in Chapter 3, removing the provision of high-quality TD processes until later stages of development (e.g., high-quality coaching, increased contact hours, and periodised challenge) may also have detrimental effects on long-term development. The likelihood of many TD

systems (e.g., football academies) delaying selection until late adolescence is also very unlikely given the socio-political realities of professional sport outlined in section 3.2 of Chapter 3. In short, assuming that it is desirable to level the relative age playing field, macro strategies can only be part of the approach.

**7.3.2 Developmental Interventions Focused on Biological Maturation**

A variety of approaches have been suggested to counter the distinct advantages conferred by advanced biological maturation. Bio-banding is the most common and frequently investigated intervention to counteract the selection and performance advantages associated with variations in biological maturation. Bio-banding is proposed as an adjunct to, and not a replacement for, age group competition, forming just one part of a diverse developmental approach (Cumming et al., 2017; Towlson & Cumming, 2022). Bio-banding involves grouping and/or evaluating athletes based on maturity status rather than chronological age (Cumming et al., 2017). It is designed to promote competitive equity and athlete safety by limiting maturity-related variation in size and athleticism (Cumming et al., 2017). There are a number of proposed ways to bio-band athletes, including grouping them into maturity bands based upon their percentage of predicted adult height at the time of observation (e.g., 80–85%; 86–90%; 91–95% predicted adult stature (Khamis & Roche, 1994, 1995) and determining maturity offset (estimating the number of years athletes are from undergoing peak height velocity (Mirwald et al., 2002)).

There are several factors to consider regarding the evidence of the impact of bio-banding. Firstly, it is important to note that most research on bio-banding has tended to be football-specific and more research is required to understand its utility across a broader range of sporting contexts (Cumming et al., 2017). However, at specific time points, bio-banding has been perceived by some youth football players to generate greater physical, tactical, and technical challenges (Bradley et al., 2019; Cumming, Brown, et al., 2018). Early maturing

players have described bio-banded competition as more physically challenging, reducing size and strength dependence and placing more emphasis on technical and tactical characteristics (Cumming, Brown, et al., 2018). Conversely, later maturing players describe experiencing a greater opportunity to use, develop, and demonstrate their physical, social, technical, and psychological competencies in a less physically challenging environment (Bradley et al., 2019; Cumming, Brown, et al., 2018). These psychosocial 'competencies' included perceptions of increased self-confidence and the ability to adopt roles of leadership as a result of being one of the chronologically older players in the age cohort (Bradley et al., 2019; Reeves et al., 2018). Older children can benefit from taking up these teaching and leadership roles during bio-banded competition and may not get such opportunities in their own chronological age groups (Hill, Spencer, et al., 2020). Increased expression of technical-tactical characteristics because of bio-banded football competition/training has also been found elsewhere (e.g., Abbott et al., 2019; Lüdin et al., 2022b; Romann et al., 2020).

Bio-banded training camps have been introduced in sports such as cricket, with players again describing differential social and challenge dynamics (Walters et al., 2021). Bio-banding has also been favourably received by various stakeholders in a youth football academy in relation to its impact on the psychological, social, and technical-tactical characteristics of the later maturing athletes (Reeves et al., 2018). Given that the risk of injury is influenced by maturation status (i.e., pre-, mid-, and post-peak height velocity) (Cumming et al., 2017), bio-banding may also offer a method to prescribe maturity-specific training loads which may reduce injury risk and optimise conditioning effects in adolescent athletes (Cumming et al., 2017). However, in a recent commentary, Towlson & Cumming (2022) argue that further research is required to determine when and how to best adjust training programmes to mitigate the risk of specific injuries and how this varies relative to the distal-to-proximal growth gradient.

Despite these positive findings, and whilst acknowledging that biological maturation clearly has a significant effect on challenge dynamics, it is important to note that bio-banding is not designed or expected to consider technical, tactical, cognitive, emotional, or social development (Cumming et al., 2017; Malina et al., 2019). For optimal development, there is a need to consider not just size and maturity-related characteristics when grouping athletes by maturation status, but also the plethora of complex factors, and their potential interactions, that influence individual development (Cumming et al., 2017; Malina et al., 2019). For this reason, in previous bio-banded competition events in youth football, participating teams were asked to consider each player's psychological and technical-tactical competencies and to consider the exclusion of those individual players of the desired maturity statuses who may not benefit from bio-banded competition (Cumming, Brown, et al., 2018). For instance, some athletes advanced in maturation may be capable of withstanding the physical demands of competing with chronologically older athletes, but they may not be of the required technical-tactical standard or psycho-social skills to cope (Cumming et al., 2017; Thurlow et al., 2022). As an example, whilst some athletes perceive bio-banding to provide the opportunity to make new friends across different age groups (Cumming, Brown, et al., 2018), other young athletes have previously reported feelings of apprehension brought about by the potential for social isolation when moving between different groups and not being with friends or other players whom they were familiar with (Reeves et al., 2018). Feelings of apprehension should in no way be considered as a universal negative and may be highly appropriate for some. Therefore, whilst there are examples of how TD systems have twinned bio-banding with offered psychological provision during periods of bio-banding (Hill, Spencer, et al., 2020), regardless of support offered, what may be appropriate for one athlete will not be for another. There is, therefore, a necessity to weigh up complex individual biopsychosocial factors to decide what is appropriate.

171

Furthermore, whilst some authors have quantitatively shown seemingly positive effects of bio-banding on aspects of technical-tactical performance in football (i.e., increased number of short passing sequences, reduced number of long passes (Abbott et al., 2019)), others have observed a more limited effect on technical-tactical characteristics of players during bio-banded competition (Towlson, MacMaster, Gonçalves, et al., 2022). In addition, research from Spanish football academies has shown that matching players by maturity status alone in small-sided games formats elicited no skill differences displayed between groups (Moran et al., 2022). This would seem to reiterate that biological maturation has no direct influence on technical skill levels and any intervention that focuses on grouping athletes solely by biological maturation will fail to account for such individual differences. On the other hand, using smaller training areas and pitch sizes presents one viable option to limit the extent to which earlier maturing athletes (e.g., football players) can utilise their athletic advantages at the expense of other performance elements (e.g., technical-tactical characteristics) (Cumming, Brown, et al., 2018; Moran et al., 2022). In this regard, Cumming et al. (2017) suggest a hybrid approach to bio-banding, consisting of monthly or bi-monthly bio-banded competitions, alongside existing games programmes.

Reflecting arguments offered earlier about RAE interventions, adopting blanket and routine bio-banding may fail to recognise the individualised and biopsychosocial nature of TD (Abbott & Collins, 2004; Cumming et al., 2017).  For example, a late maturing athlete that is relatively advantaged based on other factors (e.g., technical and tactical ability and social skills) may not benefit from competitive challenge being reduced even further (Cumming et al., 2017). Taken as a simplified example, if such steps are taken purely to level the playing field, this reduction in challenge may act as a barrier to long-term development (Collins et al., 2016; Collins & MacNamara, 2012). Yet, if the intervention has other foci, such as the development of low-level psycho-behavioural skills, then it may be perfectly appropriate. In essence, this is

a highly individualised matter, and we need to consider the intended impacts against the needs of the individual.

In addition to the challenges of individual dynamics, whilst acknowledging that the tracking of maturation is an essential feature of a talent system, the implementation of bio-banding can be resource intensive, both in terms of administration (e.g., the necessity of changing groups) and coaches understanding a wider range of individual needs. For many sports, whilst maturation testing itself can be reasonably simple depending on the method employed, it does require practitioners to conduct reliable measurements and track these longitudinally. Providing large populations of athletes with bio-banded training and competition opportunities at all stages of a talent system presents a significant challenge. It is also important to acknowledge that due to resource limitations (e.g., reduced access to skeletal X-ray assessments), coincided with the invasive nature of other predictive equations, non-invasive predictive equations to determine maturity status are commonly utilised (i.e., percentage of predicted adult height (Khamis & Roche, 1994) or predicted maturity offset (Mirwald et al., 2002)). Due to the non-invasive and predictive nature of these equations, and as with all predictive equations, these methods are associated with a degree of error (e.g., Kozieł & Malina, 2018; Malina et al., 2007, 2012; Mirwald et al., 2002). Whilst the median error bounds between actual and predicted adult height using the Khamis-Roche method is just 2.2 cm in males aged between 4 to 17.5 years (Khamis & Roche, 1994, 1995), this predictive equation is derived from retrospective datasets of American youth of European ancestry, and this must be acknowledged when applied to populations of differing nationalities and ethnicities. Moreover, both the updated and original equations for the predictive maturity offset method are suggested to be unreliable for both early and late maturing males and females, with an overestimation of the predicted ages at peak height velocity in early maturing youth and an underestimation in late-maturing youth (Kozieł & Malina, 2018). This inability to differentiate

between early and late maturing youth using the maturity offset equation can lead to athletes being categorised incorrectly.

A suggested complement to bio-banding is Discreet Performance Banding (DPB), where athletes are grouped based on the performance of a discreet skill or ability that is highly valuable in their sport (e.g., change of direction ability in football), rather than using a marker of implied performance (e.g., maturation alone) (Moran et al., 2022). DPB using change of direction ability in youth football has been suggested to differentiate variations in skill levels (passing, shooting, ball control), with the suggestion that it may hold the potential to level competition in youth sport from a skill perspective (Moran et al., 2022). Therefore, it has been proposed that bio-banding, alongside DPB and chronological age group competition, may diversify the experiences of young athletes and expose them to new and varied challenges. However, the validity of a single discreet marker to differentiate between athletes seems highly questionable. Such a method presents an overly blunt instrument that fails to take account of the broader biopsychosocial influences on performance. As an example, change of direction ability is a poor proxy for technical ability, tactical understanding, or psychological skills. This is especially the case as research on DPB is in its infancy and the method remains largely conceptual and untested (Moran et al., 2022).

Although not specifically an intervention for biological maturation or relative age, 'playing up' athletes who have early advantages against chronologically older or higher performing peers has been suggested to facilitate more appropriate levels of challenge and individual development (Kelly et al., 2021). Playing up has been perceived by youth football players to elicit improvements in fitness and sport-specific skill, social capital, and social adaptability, as well as being rewarding when recognition and success are experienced (Goldman et al., 2022). Indeed, these findings are somewhat unsurprising given the social status conferred by selection. Whilst 'playing up' at face value may present athletes with a

174

higher level of challenge, conferring some technical-tactical benefits (Kelly et al., 2021), it may also lead to individuals relying on previously developed strengths, rather than developing potentially career-limiting weaknesses (Taylor & Collins, 2019). Athletes who play up may also face difficulties in coping with the increased intensity of competition and when fitting in with older teammates (Goldman et al., 2022). Somewhat counter intuitively, playing up can also provide a level of validation and reduced performance expectation that may actually reduce the perception of challenge (Taylor & Collins, 2021). Therefore, whilst it is clear that playing up or down significantly affects the perception of challenge, qualitatively, its impact cannot be assumed, with effects depending on a range of individual and environmental factors. In this sense, further qualitative and longitudinal research is required to understand the experiences of those who play up and the long-term benefits of developing expertise (Kelly et al., 2021). As with previous interventions, the application of these approaches is likely to be a highly individual matter.

## 7.4 Challenge Dynamics

The range of developmental interventions reviewed in this chapter are aimed at the management of challenge dynamics through a pathway. To build a case for practical approaches it is, therefore, important to contextualise these dynamics within the existing literature. As outlined in section 2.6.3 of Chapter 2, the importance of developing a range of psycho-behavioural skills to learn from and cope with challenges is well-established as an important requisite for developing excellence in sport (e.g., Collins et al., 2016; Collins & MacNamara, 2012; MacNamara et al., 2010a, 2010b; Savage et al., 2017; Taylor et al., 2022b; Taylor & Collins, 2019, 2020, 2021). Crucially, without the early acquisition and development of an adequate psychological skillset (that challenges can generate), athletes can be derailed by step changes in challenge that can occur towards the higher echelons of performance (Taylor

& Collins, 2019, 2021). In contrast, if the development of psycho-behavioural skills can subsequently be tested by a range of appropriate challenges, the consequent emotional disturbance, coupled with appropriate support, can provoke further refinement of these skills (Taylor & Collins, 2020).

Following this line of research, literature has challenged the assumption that being relatively younger or biologically late-maturing is unequivocally detrimental to development, instead identifying the potential later advantages of early disadvantage (e.g., Cumming, Searle, et al., 2018; Gibbs et al., 2012; Ostojic et al., 2014; Till et al., 2016). One example is the reversal of relative age advantage, where relatively younger athletes are proportionately more likely to reach elite senior status despite a disproportionate number of relatively older athletes being selected at the youth level (McCarthy et al., 2016). This is something now replicated across sporting contexts (Andrew et al., 2022; Kelly et al., 2021). Importantly, this is a reversal of advantage rather than the RAE reversing, suggesting that relatively younger athletes are less likely to be deselected than their relatively older counterparts (McCarthy et al., 2016). Various mechanisms have been suggested to explain advantage reversals, including that relatively younger athletes are thought to benefit from the increased levels of competitive challenge when competing with their older counterparts who possess age and experience associated advantages. This increased level of competitive challenge has been proposed to benefit the relatively younger athletes, stimulating their adaptive development, and facilitating long-term progress. This has specifically been referred to as the 'underdog hypothesis' (Gibbs et al., 2012). Similarly, the comparatively greater challenge that is experienced by later maturing athletes within a development environment where they are competing against early maturing athletes with physical, physiological, and functional advantages has been proposed to encourage the development of superior technical-tactical and psychological skills (Cumming, Searle, et al., 2018). The development of these superior technical-tactical and psychological skills is

proposed to allow the later-maturing athletes to survive and thrive in an environment where they are physically disadvantaged (Cumming, Searle, et al., 2018; Gibbs et al., 2012). Although these superior technical, tactical, and psychological attributes may be less obvious throughout childhood and early adolescence, they are proposed to become salient in late adolescence and early adulthood once the physical advantages associated with advanced biological maturity become attenuated (Cumming, Searle, et al., 2018). However, it is possible that many younger/late-maturing athletes always possessed such superior abilities which has allowed them to be initially selected into and remain within the system. Indeed, it is equally plausible that many early maturing players also possess and/or develop superior technical-tactical and psychological skills within the same TD system despite not being exposed to the same physical challenges (Zuber et al., 2016).

There is some evidence to suggest that late-maturing football and rugby academy players and relatively younger rugby players are proportionately more likely to progress to the elite adult level than early-maturing/relatively older players if retained within the system (Andrew et al., 2022; Kelly et al., 2021; Ostojic et al., 2014; Till et al., 2016). Whilst in support of the underdog hypothesis, it is also important to recognise the opposing methods used to estimate/examine maturity status (i.e., maturity offset method (Mirwald et al., 2002) vs. TW3 method (Tanner et al., 2001)) within these biological maturation-specific investigations, as well as the different criteria used to classify early, late, and on-time athletes (Ostojic et al., 2014; Till et al., 2016). Contrasting evidence from Swiss national-level youth football also suggests that many late-maturing players, despite possessing superior technical abilities and being exposed to the 'underdog challenges', are still deselected from the TD system by age 15 years (Zuber et al., 2016). However, this does not suggest that these players still did not progress to become elite senior athletes; there is no longitudinal data to indicate how these challenges influenced long-term development through to the senior level (Zuber et al., 2016). Critically,

however, if the underdog hypothesis were to exist, potential 'underdog' effects of being relatively younger or biologically late maturing would only hold if relatively younger/late-maturing athletes are retained within the system. Contrasting with the original underdog hypothesis (Gibbs et al., 2012), it is not the provision of higher challenge but, instead, how the individual responds to challenge that is a key determinant of success (Collins et al., 2016, 2019). Rather than directly causing development, challenge acts to test previously developed psycho-behavioural skills (Barnes et al., 2021; Savage et al., 2017). As proposed in section 2.5.2 of Chapter 2, it is important to note that late maturing players likely remain underrepresented at the adult level in absolute terms due to a smaller initial representation within the academy system. Indeed, a prime example of this in a relative age context has been presented in U17, U19, and senior-level international male football players (Andrew et al., 2022). Reflecting general limitations in biological maturation and RAE research, there is a lack of longitudinal data to support this proposition across contexts. End-stage conversion rates are often used as a metric for the underdog hypothesis (Gibbs et al., 2012), but caution is advised when examining end-stage conversion rates as a metric for career outcomes as some populations may still be over or underrepresented in absolute terms.

## 7.5 Push and Pull Factors

Being born late in the selection year or being late maturing biologically does not serve as a direct advantage or disadvantage; instead, the dynamics of challenge events are highly individual. Presenting a holistic view of challenge dynamics, McCarthy et al. (2022) suggested the concept of push and pull factors to conceptualise factors that may confer relative advantage or disadvantage for the athlete. Their hypothesis is that at the population level, the average early-born athlete will be subject to more push factors—those factors that act to accelerate early performance—whereas the later-born athlete will be subject to more pull factors—factors that

act to retard early performance. Abundant push factors will encourage early performance at the junior level but may hinder later progress. In contrast, those athletes who experience a greater prevalence of pull factors may experience a more developmentally optimal experience (Collins & MacNamara, 2012). Importantly, however, those athletes who are subject to an overwhelming volume of 'pull' factors might also become chronically disadvantaged, especially if these are external to the sport (Book et al., 2022). This seems to support the notion that significant challenge factors in an individual's life outside of sport are not an adaptive feature of development (Collins et al., 2016). There is, therefore, a practical necessity for strategic consideration and a subtle balance in how this approach is applied. An overabundance of pull factors may risk derailment, with repeated performance setbacks, negative feedback, and resultant negative emotional states unlikely to build an athlete's motivational resources (Taylor & Collins, 2019, 2020; Williams & MacNamara, 2022). In essence, pull factors are not necessarily positive for overall development, especially if preventing athletes from ever being selected. Based upon the literature synthesised, later-born athletes will, on average, be subject to more pull factors. As a result, the typical later-born selected athletes will be provided with a higher frequency and intensity of challenge to navigate as they progress. Reflecting the distinction between relative age and maturation, this suggests that early maturation is, in itself, an independent push factor, whereas late maturation is a pull factor. Thus, early maturing athletes are more likely to have significant physical, physiological, and functional advantages and consequently are more likely to be selected in contexts where these attributes provide advantages relative to peers. However, competing against less-mature peers may prevent the testing of psychological skills for the early maturing athletes (Cumming, Brown, et al., 2018; Cumming, Searle, et al., 2018). Indeed, evidence presented in Chapters 4, 5 and 6 suggests that late biological maturation appears to be one of the most prominent pull factors in the TD context.

## 7.6 Implications for Practice in Talent Systems

Seeking to present implications for practice, there is a need to conceptualise the interventions that are critiqued within the broader whole. In doing so, push and pull factors may offer the potential for a holistic and practical view of challenge in talent systems in sport. For those seeking to operationalise these factors, there is the need for a highly context-dependent and, ideally, individualised approach. Talent systems can be considered at three levels. The macro represents the interactions between organisations, typically at the national/international level (e.g., NGBs, such as the FAI). The meso is typically a collection of microsystems or 'all aspects of the coaching situation' (Martindale et al., 2005, p. 345) (e.g., an academy). The micro level represents the individual interactions that occur day-to-day in practice (Taylor et al., 2022c). Thus, rather than looking at single variables, there is a need for talent systems to frame their actions in a deeper understanding of the effects and potential side effects of interventions. This requires maximum flexibility at each level of a system.

### 7.6.1 Micro-Level Implications

Reflecting the emphasis on individual dynamics, this section will begin with reference to the micro level. This contrasts with the majority of reviewed interventions, which predominantly aim at the macro or meso level. At the micro level, if individuals are to be presented with appropriate challenge levels, there is a necessity to adapt to inter and intra-individual differences with a focus on the perceptions and needs of the individual athlete. This relies on a granular understanding of athletes' circumstances and the empathic accuracy necessary to notice change (e.g., Lorimer & Jowett, 2010). In all instances, an understanding of the maturational status of athletes is a useful data point for the coach and practitioner to make sense of the needs of a particular athlete. Yet, it should not be the only matter for consideration, nor

should assumptions be made regarding relative advantage or disadvantage based on a single data point. Take the example presented earlier: a late-maturing athlete that holds a technical advantage relative to their age group is unlikely to be further challenged under the same circumstances playing against peers who are chronologically younger but matched in maturation (Cumming et al., 2017). However, if the goal was to expand their tactical understanding, develop leadership skills (Cumming, Brown, et al., 2018) or provide a metacognitive challenge (Price et al., 2020), playing down an age group might facilitate the social circumstances necessary to support this process. Likewise, an early-maturing sprinter who has dominated in their chronological age group might strongly dislike the experience of competing against older, but more capable athletes. It may also be the experience that facilitates a refocus on weaknesses in their approach. Whilst competing at a higher level may seem like an appropriate intervention to provide additional levels of challenge, if an athlete does not have the psycho-behavioural competencies required to benefit, such a step change in challenge may be too great for that athlete to handle. Most importantly, in all these circumstances, it is not the event itself that will automatically confer development. Instead, it is the athlete's perspective and use of psychological skills, actively shaped by coaches and peers, that is critical (Taylor et al., 2022b).

On a broader note, at the micro level, it is also important to understand the individual context of each athlete from the totality of their experience and their lives, rather than solely age or maturity status alone. Take, for example, an athlete that is facing an abundance of pull factors outside of sport; after all, maturation or relative age is not the only important consideration, particularly in instances where an athlete is overwhelmed by an abundance of pull factors outside of the athletic domain. This approach is something which, despite some debate, is increasingly acknowledged as undesirable for TD (Book et al., 2022; Collins et al., 2016; John et al., 2019). In essence, this becomes a more holistic and individual process,

understanding a range of different push and pull factors and how they impact individual talent trajectories along with the ability of individual practitioners to make effective decisions about what is needed for those athletes. This will require a broader approach than, for example, playing up/down or finding alternate means of grouping athletes. It necessitates fundamental changes to practice, requiring the coach or practitioner to actively present individuals with appropriate levels of challenge. Reflecting the points made in section 7.3.2 in respect to bio-banding, this presents a necessity for a level of expertise to respond to individual developmental needs and experiences of each athlete as they arise (Collins et al., 2015). In this sense, the Professional Judgement and Decision Making (PJDM) of the individual coach or TD practitioner becomes a key facilitator of learning and progress (Abraham & Collins, 2011; Martindale et al., 2007).

### 7.6.2 Meso-Level Implications

To enable these processes at the individual level, there are several key considerations at the organisational level beyond those made previously in the literature regarding recommendations for effective practice (e.g., Henriksen & Stambulova, 2017; Martindale et al., 2007; Taylor & Collins, 2022a). The identification and selection of athletes has received significant attention in both the literature and practice, often being viewed as distinct from challenge dynamics. Rather than a search for athletes most likely to progress to the elite level, a more developmental and practical lens should be applied to selection processes. This requires a focus not only on current performance, but also on the likelihood of further development (Baker et al., 2018) and contribution to the further development of peers. In this regard, it is likely that the previous successful navigation of sport-based challenges, such as a high prevalence of pull factors like late biological maturation, relative to current performance, may signal what Baker et al. (2018) referred to as 'high potential'. That is, despite being subject to significant challenge, an athlete

is 'sticking in there'. This raises several practical questions: how can we know about these factors if our approach to selection is the 'talent scout' observing performance alone? Similarly, we cannot rely on single-variable interventions (e.g., Mann & van Ginneken, 2017) used as a proxy for the complex web of dynamic challenge factors that seem to play a central role in development. Strategically this will require systems to hold a contextually defined view of the purpose and function of selection. At the meso level, this would see organisations (e.g., individual academies) moving away from traditional talent spotting, something that is consistently doubted in the literature (Abbott et al., 2005; Güllich, 2014), towards a more pragmatic, contextualised view with decisions made based on a broader picture of biopsychosocial factors (Bailey et al., 2010). For example, as discussed in Chapter 3, early selection in football academies is a political necessity and one that affords the opportunity to shape a developmental journey. In other sports, macro national systems have legislated to limit the timing of selection and for a broader population to be selected (e.g., English rugby union regional academies (Kelly et al., 2021)), yet with less opportunity to shape athlete development over time. In other contexts, as reported in Norwegian handball (Bjørndal & Ronglan, 2020; Bjørndal & Ronglan, 2018), selection is seen as supplementary, with participation, development and performance contexts running in parallel; an approach that promotes a breadth of engagement opportunities but presents additional challenges to the shaping of athlete experience.

Whilst these recommendations do not suggest that there is a need for organisations to move towards a complete equity of push and pull factors, if selection processes at the organisational level exclude cohorts of athletes, this should warrant deliberate attention. This attention should include a pragmatic discussion regarding the relative weighting of resources needed to address the disparity. As an example, Chapters 5 and 6 have demonstrated that there is a near total exclusion of late maturing youth players in the FAI's national TD system. This

183

is a significant issue, especially as stakeholders in Chapter 4 perceived there to be limited routes back into the pathway once deselected and a marked difference in development provision between those who are in and out of the system. Yet, given that there is no optimal balance of what selection should look like (e.g., the proportion of early, on-time, and late maturing players within an academy), organisations should be encouraged to critically reflect on the desirability of selection cohorts being strongly weighted towards push factors like early biological maturation, as evidenced in Chapters 5 and 6.

Moving beyond the reasoning that the function of talent systems is simply to select the right athletes, the second core meso-level concern is the management of challenge throughout development. Many of the foci for proposed solutions suggest the benefit of an overall fluctuation of challenge level for the individual athlete, elsewhere referred to as periodised challenge (cf. Collins et al., 2016). Rather than relying on targeting single variables, at the organisational level, the focus should be placed on challenge management. The ideal output of this approach would be the integration of systems and support figures to maintain coherence for the athlete (Taylor & Collins, 2021). In high-resource organisations (e.g., Category 1 football academies in the UK), this may be multiple staff feeding into a development plan for an athlete directing the types of experiences appropriate for their development, informed by an assessment of push and pull factors. At the lower resourcing end (e.g., schoolboy football clubs), this profiling might be done by an individual coach. Where a range of support figures are present (e.g., coaches, practitioners, parents), there is a need for a shared understanding of individual challenge dynamics, especially if athletes are to move between different levels of performance and training groups. It is for this reason that shared mental models (SMMs) have been proposed as a vehicle to support integrated practice (Taylor et al., 2022b). SMMs refer to 'an organised and common understanding among team members regarding the essential aspects of work and how they should behave in specific situations' (Sinval et al., 2020, p.1). SMMs

among coaching and support staff would allow coaches to understand each athlete's individual needs and adapt their decisions based on individual circumstances. For example, evidence in a football context has demonstrated that SMMs between coaches and players was essential for coordinated efforts and collective decision making in competitive situations (Gershgoren et al., 2013). Recent evidence in the rugby union context also suggests that SMMs can enhance the coordinated efforts of players and coaches (Ashford et al., 2023). Ongoing case conferencing, coaching communities of practice and review processes that are designed for the co-construction and sharing of knowledge amongst staff becomes essential, especially as SMMs cannot be assumed as a function of time spent together (Bowles & O'Dwyer, 2022; Price & Collins, 2022).

Building upon the points made, it is important to recognise that such flexibility at the meso level poses a challenge to integrated practice, especially in a resource-intensive talent pathway such as the FAI's with large numbers of staff and with an absence of vertical and horizontal coherence. For example, if a dominant early-maturing adolescent athlete is selected for a senior competition, we cannot assume this selection automatically confers a higher level of challenge. Instead, it is how the athlete's experience is curated that matters. This requires multiple people to hold a shared understanding of the purpose and plan. It could be done in a manner that confers the athlete with enhanced self-efficacy or lower pressure based on role clarity (Taylor et al., 2022a). In contrast, it could also be used to highlight weaknesses, generating feedback in areas that have previously not been challenged with and against age-matched peers.

Therefore, there is a necessity for organisations to monitor the prevalence of push and pull factors for their athletes on a longitudinal basis, utilising individual biological maturation status along with other suggested push and pull factors that have been identified in the literature (e.g., familial influence (Côté, 1999), socio-economic status (Rowley & Graham, 2006) and

quality of previous coaching (Li et al., 2014)). In contrast, relative age data should be used differently, given that at the individual level it might not indicate individual challenge dynamics. Instead, it could be used to understand the relative make-up of selection cohorts over time, or to consider the efficacy of challenge management processes if higher proportions of players with greater early advantages continue to be deselected (Kelly et al., 2021; McCarthy et al., 2016).

### 7.6.3 Macro-Level Implications

Building from the micro and meso, the main critique thus far of most existing and well-intentioned approaches to the management of challenge is the lack of individual flexibility of approach. It would appear that any strategic approach to relative advantage or disadvantage should be focused at the meso and micro level, rather than at the macro level. Consequently, this presents a necessity of a more fine-grained approach to the grouping of young athletes and the provision of challenge (McCarthy et al., 2022). As noted by Cumming et al. (2017), if approaches like bio-banding are to be adopted wholesale, then we may simply advantage and disadvantage a different group based on less-measurable constellations of characteristics. Implementing blanket strategies to mediate against disproportionately high pull factors is overly simplistic and lacks holistic consideration of the biopsychosocial factors that influence relative advantage or disadvantage. Many existing approaches also focus on attempting to 'level out' challenge level which, based on the existing evidence base and applied at the population level, may be suboptimal given that it may be desirable for periods of high and low challenge levels to be pulsed through a pathway (Taylor & Collins, 2020). Indeed, talent systems may also ask if it is desirable for those who experience more push factors in development to be grouped together for appropriate challenge, so long as there is a vehicle for others to receive appropriately high-quality development.

Ultimately, rather than a bureaucratic regulatory approach, flexible systems should allow for practitioners to make decisions and respond to individual athlete needs. Therefore, there is a need for maximum flexibility and informed decision making for organisations and individuals. As is currently the case in the vast majority of systems, it may be easier for the top-down mandating of one approach for all, rather than encouraging informed flexibility. However, based on a model of a top-down and bottom-up approach to talent strategy (Taylor, et al., 2022c), as far as possible, national systems should remove barriers to optimising individual challenge, as well as provide high-quality input to individual organisations to enhance their approaches. As an example, the Royal Belgian Football Association's Futures Programme is a meso approach to provide developmental opportunities for later-maturing athletes (Royal Belgian Football Association., 2019). It enables opportunities for late-maturing players to be retained within the system and experience training, competition, coaching, and travel as part of a national team. In this instance, the strategy still means that selection is based on players being identified as technically, tactically, and psychologically able for youth international football. However, if this approach was adopted as a policy requirement on a broader scale, it would prevent existing organisations from adopting strategies appropriate to their unique context.

In terms of 'fairness', it is here that macro systems characterised without a step change in the quality of environment between those who are selected and not seem to hold an advantage (e.g., Bjørndal & Ronglan, 2018). Yet, this also means the provision of high-quality support to a large population which is highly resource-intensive (Taylor et al., 2022c). The key point is that there are no value-free judgements to be made in this area. At all levels, we need to recognise the various trade-offs inherent to managing the dynamics of development. If the more holistic approach suggested is to be adopted, there is also a need to promote decision making and integrated action through intelligent mediums. As such, any strategic approach should be

enabled by the macro, but should be targeted at the meso and micro level of a TD system. This necessitates macro support for coach and practitioner development on a holistic and evidence informed basis. In addition, the need to generate SMMs of outcome and performance is likely a necessity, especially where multiple stakeholders impact on the curriculum of an athlete (e.g., Bjørndal & Ronglan, 2018; Curran et al., 2021, 2022).

## 7.7 Conclusion

This chapter has reviewed the literature that seeks to negate some of the various selection and challenge dynamics in talent systems. Whilst many of these biases may come at the population level, the dynamics of challenge effects are highly individual. In all cases, research and practice should view the use of challenge mitigation approaches, like bio-banding, as tools to use at the individual level rather than strategies to deploy at the macro or meso level. There is no 'gold standard' approach to challenge management. What constitutes effective practice in this regard is highly contextual and determined by a myriad of other biopsychosocial factors that extend far beyond date of birth or current maturation status alone. Consequently, whilst there is of course a need to understand the dynamics illustrated by the vast literature in biological maturation and relative age, there is also a need for the research to investigate less quantifiable factors that might impact development. In addition, there is a need for researchers and practitioners to appreciate this broader and perhaps interdisciplinary picture, along with the value proposition of interventions in talent systems. Thus, a key recommendation in regard to challenge dynamics would be an end to the focus on 'levelling the playing field' of a phenomenon that has so many complex factors at play. In practice, there is an opportunity for talent systems to adopt a more holistic approach by conceptualising biological maturation and relative age within a broader spectrum of challenge dynamics and considering how other, less-measurable factors also impact athlete development.

# Chapter 8: Riding the Wave: A Prospective Exploration of the Temporal Impact of Perceived Challenges and Psychological Safety on National-Level Youth Footballers' Development.

Sweeney, L., MacNamara, Á., & Taylor, J. (Under Review). Riding the wave: A prospective exploration of the temporal impact of perceived challenges and psychological safety on national-level youth footballers' development. *Psychology of Sport and Exercise.*

## 8.1 Introduction

Chapter 7 provided a significant contribution to the literature by critically reviewing the interventions presented by the extant literature to influence the challenge dynamics associated with biological maturation and relative age. A key recommendation from that chapter was the need for talent systems to adopt a more holistic approach to challenge, with a broader recognition of the biopsychosocial 'push and pull factors' that impact challenge dynamics in TD. As discussed in Chapter 2, TD is a complex, dynamic, and typically non-linear process, with a range of biopsychosocial variables having the potential to impact a young player's progression (Abbott et al., 2005; Collins et al., 2019; Collins & MacNamara, 2019; Webb et al., 2016).

Reflecting this non-linearity, and the issue of conflating conversion rates with the quality of the development environment, most youth footballers selected into the system at early stages of the pathway do not transition to the elite senior level (Güllich, 2014; Haugaasen & Jordet, 2012; Herrebrøden & Bjørndal, 2022; Schroepf & Lames, 2018). These outcomes were discussed in Chapters 2 and 3. Moreover, findings from Chapters 5 and 6 suggest that there appear to be significant selection biases in favour of those with early advantages. The

prevalence of these early advantages is illustrated at the population level within Irish football's talent system, with a significant proportion of the national-level population slanted towards those that are relatively older or advanced in biological maturity. These findings have been replicated across other academy contexts (e.g., Andrew et al., 2022; Hill et al., 2020; Johnson et al., 2017; Lovell et al., 2015; Parr et al., 2020a; Ruf et al., 2021; Zuber et al., 2016). Against this basis, there have been calls to reconsider the pathway experience of aspiring footballers (cf. Brown & Potrac, 2009). Indeed, Chapter 7 called for the need to consider the challenge dynamics associated with selection, deselection, and development experiences within these environments.

As discussed in section 2.6.4, the concept of psychological safety (e.g., Edmondson, 1999, 2019) has begun to gain attention in the sporting domain (e.g., Jowett et al., 2023; Taylor et al., 2022a). Despite the growth in both applied (e.g., Taylor et al., 2022a) and research (e.g., Jowett et al., 2023) interest, psychological safety lacks a consensus definition applicable to the sporting context (cf. Taylor et al., 2022a). The inconsistency in which psychological safety has been defined in the sporting literature was outlined in section 2.6.4, with some authors utilising the traditional Edmondson (1999) definition (e.g., Jowett et al., 2023), with others (e.g., Vella et al., 2022) using an independent conceptualisation. Regardless of the way in which psychological safety is defined, Taylor et al. (2022a) questioned the extent to which psychological safety is appropriate and applicable in the sporting context. To this end, Taylor et al. (2022a) examined the extent to which psychological safety was an adaptive feature of development in international and released professional rugby union players. As discussed in section 2.6.4, a lack of psychological safety was a constant factor in the professional careers of all players, predominantly driven by the judgement conferred by selection and deselection decisions, with the extent to which athletes individually perceived their circumstances to be 'safe' impacting them differentially. Whilst the ability to cope with and develop in a

psychologically unsafe environment appeared critical to the progress and adaptive responses of successful players, the pressure conferred by a lack of safety was significantly fatiguing and long-term exposure was perceived as exhausting (cf. Taylor et al., 2022a). To date, this is the only published empirical investigation into the role of psychological safety in the high-performance sporting context. However, this data was specifically grounded in the elite adult male rugby union context, and there is a need to investigate the concept in the TD context to understand how the dynamics of selection impact individuals.

In the context of this thesis, there is no evidence that has specifically investigated psychological safety amongst younger participants who have been explicitly identified as being members of TD systems (Taylor et al., 2022a). The evidence presented by Taylor et al. (2022a) would suggest that a lack of psychological safety is an environmental feature that can impose challenge on an athlete. As discussed throughout Chapter 2, research on the role of challenge in the development of high-level sports performers has been dominated by retrospective designs (e.g., Collins et al., 2016; Savage et al., 2017, 2022; Taylor et al., 2022b) and there is a lack of prospective and longitudinal research into the role of challenge experience in the development of talent. Although research on the role of challenge specific to football academy players is limited, in section 2.6.3 I discussed how academy players generally report the pressure of having to consistently perform the required standards, fear of judgement from coaches, high technical-tactical demands, fear of losing their space in the academy, and the high levels of intra-group competition as their most significant challenges (e.g., Hem et al., 2022; Sothern & O'Gorman, 2021; Swainston et al., 2020). Whilst these investigations have contributed to our understanding of the challenges experienced by young academy players, they have generally focussed on collecting data at a specific moment in time (e.g., entrance into an academy, transition point, before/after selection/deselection procedures, pre-season) and thus, offer limited perspective on the temporal nature of the challenge experience for young

players. There is a need for more research on the processes and mechanisms that shape performers' interpretations and responses to challenge, including longitudinal and action-research based enquiry that tracks the 'highs and lows' of development (Savage et al., 2017). A temporal exploration of the experiences of young athletes in the early years of their talent pathway can help inform the approaches taken by coaches to better utilise challenge and support mechanisms (cf. Williams & MacNamara, 2022).

Therefore, in line with the eighth research objective outlined within section 1.7 of Chapter 1, this longitudinal investigation sought to prospectively explore the temporal impact of perceived challenges and psychological safety on the development of youth football players upon their entrance into, and first season in, the FAI's national TD system. In the context of this study, psychological safety was defined as that originally outlined by Edmondson (1999), which refers to the dual effect of a shared belief that people can speak up without interpersonal risk and that making mistakes will not lead to punitive consequences.

## 8.2 Methodology

### 8.2.1 Research Context

As outlined in section 5.2.1, the National Academy is the first national level selection programme within the FAI's boys' national player pathway, which was created to assist in the development of Ireland's highest potential players in the under 13 and 14 age cohorts. National Academy players are exposed to the increased amounts of training and competition along with additional coaching and developmental support with the aim being preparation for international football. National Academy training/competition events take place 1-2 times per month. Reflecting this important transition, this investigation focussed on players at the first step of

the national talent system; those players enrolled within the FAI National Academy under 13 cohort.

### 8.2.2 Research Philosophy

Reflecting my philosophical positioning (see Section 1.6), this research investigation was underpinned by a pragmatic research philosophy (Giacobbi et al., 2005). Indeed, the intention for all pragmatic research is to generate knowledge that can be applied effectively for the benefit of the individuals and groups under study (Badley, 2003). With this in mind, a qualitative and interpretive research design was deemed most appropriate as a means of understanding participant experience of challenge and the temporal impact of their experiences. As stated in Section 1.5 of Chapter 1, I was embedded within the FAI's player pathway, and thus, I was familiar with the FAI's National Academy, including the coaches, training facility, training and competition structures, and assessment procedures. Recognising the value of this positionality, this facilitated the generation of novel and innovative insights (Bryant, 2009) by allowing me to combine my applied experience within the specific context under investigation with relevant theoretical and empirical literature to generate practically meaningful information.

### 8.2.3 Participants

Six FAI U13 National Academy players (start of the FAI national talent system) were purposefully sampled for this study. Players were aged between 12.7-13.2 years (Mean = 13.0, SD = 0.21 years) at the start of this research investigation. Following ethical approval by the Dublin City University Research Ethics Committee, the FAI National Coaching Coordinator was asked to shortlist players using three criteria: a) those regarded as the best current

performers (top 25% of the cohort in terms of current performance) relative to their peers in the U13 age group; b) based on geographic distribution, with a maximum of one player from each region; and c) a maximum of one participant per playing position. Following this nomination process, the FAI National Coaching Coordinator was asked to pass this potential list of players to a gatekeeper within the FAI. The gatekeeper then contacted the parents/guardians of the potential players, providing them with information about this investigation and to ask for their consent to be contacted about participation in this study.

All parents/guardians agreed to be contacted, and each were contacted by email with a detailed information leaflet outlining the purpose of the study, the procedures involved, and an information leaflet adapted for minors. Following each parent/guardian offering their consent, I arranged individual information meetings on Zoom (Zoom Video Communications, San Jose, California, USA) with each parent and player. In these information meetings, the purpose and protocols of the investigation were discussed in further detail with confidentiality and anonymity assured. Within these meetings, players and parents were also provided with an additional opportunity to ask any further questions. After agreeing to participate in this investigation, each parent provided written consent before data collection, and players provided written assent. Players and their parents were informed that participation in this research was voluntary and that their status in the national squad would not be influenced by their decision to participate. Participants were also informed that none of the information that they provided would be shared with the FAI, and that the findings of this study would be presented in a pseudo-anonymised, confidential, and non-specific manner.

The biological maturity status of each participant was also recorded at the start of this investigation. The methods used to obtain and estimate biological maturity status, the equation used to adjust for the overestimation of self-reported parental heights, the Z-score criterion used to classify players as early, on-time and late maturing, and the equipment used to measure

the anthropometric variables of the players are the same as those outlined in section 5.2.4 of Chapter 5. At the start of this investigation, according to relative biological maturity status, all six of the participants were classified as early maturing (had a maturity Z-score of $> +0.5$; section 5.2.4). Given the status of the sample as being part of a relatively small group selected for a national talent programme, further participant information is limited to protect anonymity.

**8.2.4 Data collection, Member Reflections and Trustworthiness**

I interviewed each player once a month over the playing season, with at least once parent present for each interview. As such, each player was interviewed seven times, with a total of 42 interviews in this study. Players were interviewed reflexively with the use of a semi-structured interview guide consisting of open-ended questions and relevant follow-up prompts. Based on the terms of the ethical approval from the Dublin City University Research Ethics Committee, parents were required to be present for all interviews. The interview process began at the start of the national programme (after the first session of the year) upon each player's entrance into the FAI National Academy and continued until the end of that football season. Interview questions were designed to identify the challenges faced by players within the national TD system, how players reacted to and managed these challenges, and how they were supported during these experiences (e.g., 'Are you finding training and matches challenging with your club?', 'Did you find anything challenging at the National Academy this month?', 'Is there anything that you didn't enjoy at the National Academy this month?'). Follow-up prompts were used to expand on specific points raised throughout the interview and to ensure that the conversation flowed in a manner that was relevant to the research questions (e.g., 'Why was this so challenging?', 'How did that make you feel?', 'Was there anyone supporting you or helping you during these challenges?'). Interviews were conducted between each player and me, and parents were asked not to comment during the recorded interview process. Interviews

were conducted with flexibility and fluidity to resemble the flow of a real-world conversation, with considerable scope to be spontaneously responsive to the players' unfolding accounts. The interview guide was underpinned by my knowledge and experiences as a practitioner in the National Academy (see section 1.5: my context and positioning), and questions were designed with a focus on identifying the key challenges that players were experiencing within their pathway. The semi-structured interview guide remained consistent for all interviews and is available within Appendix L. The study protocol is outlined in Figure 8.1.

At the start of each monthly interview, I utilised member reflections to enhance the robustness and depth of the findings throughout the data collection process (Smith & McGannon, 2018). The purpose of utilising member reflections is not to verify results, find correspondence with the truth or to get an independent reality, but rather to encourage participant reflection and subsequent generation of additional data and insight (Smith & McGannon, 2018). During each interview, I recorded my personal reflections of the discussion with that player in a reflexive journal, recording any key topics and themes discussed in that interview that I believed to be relevant to the research questions. The recording of my personal reflections and insights in this journal was also utilised as a way of engaging with the data (Braun & Clarke, 2021), which supported the analytical process (see section 8.2.5). Following my monthly analysis of data (section 8.2.5), I would also record the key overarching themes discussed in that interview in the journal.

During the member reflection process, I referred to transcripts of previous interviews and my journal notes to discuss and follow up on key topics. Thus, players were presented with what I believed to be their most important experiences from the previous interviews (e.g., their challenges: injury, trial events, fixture congestion), notable events (e.g., recent club matches or training events, school), or concerns (e.g., nerves, performance anxiety, worries about status in the group)). As a consequence of member reflections, players often built upon previous

discussion points, elaborating on their experiences, offering a sense of both a lived and reflective perspective (cf. Kahneman & Riis 2005). Over the course of the season, as I spent more time with the players both in the applied environment, attending all National Academy training events and competitions, both interviews and member reflections were enhanced by increasing trust and rapport. Thus, the depth and quality of member reflections improved with participants speaking more openly about their experiences (Sparkes & Smith, 2009). Thus, whilst the core structure of the interview guide remained the same for all interviews, the initial interview questions focused on the member reflections process; with the orientation of the conversation dependent upon the key themes discussed in previous interviews.

As an example, below is a quotation from a member reflection with Player 4 in which he elaborates on the previous months experience of playing an internal trial match at the National Academy against an U14 Irish national team for the first time, where he offers a reflective perspective on previous experience: 'One other thing that I thought to myself [about last month's session] would be just the intensity that they play at and how quick everything is, not just their speed, but how quick passes and everything like that actually is. That was quite challenging at the start'. Given that member reflections and interviews were continuous, all data were integrated as part of the analytical process (see section 8.2.5).

Interviews were conducted electronically over a period of seven months via video interviews using the Zoom video software (Zoom Video Communications, San Jose, California, USA), which is recommended as an alternative method to face-to-face interviews to gather rich data whilst facilitating an appropriate participant experience (Gray et al., 2020). Electronic interviews were selected to maintain participant confidentiality from other FAI National Academy players and staff, which would not have been possible with in-person interviews conducted at the national training complex. Electronic interviews were also appropriate to mitigate against the risks of Covid-19 transmission. Excluding an initial briefing

and warm-up questions, interviews lasted between 19 and 59 minutes. Each interview was audio recorded and then I manually transcribed each verbatim.
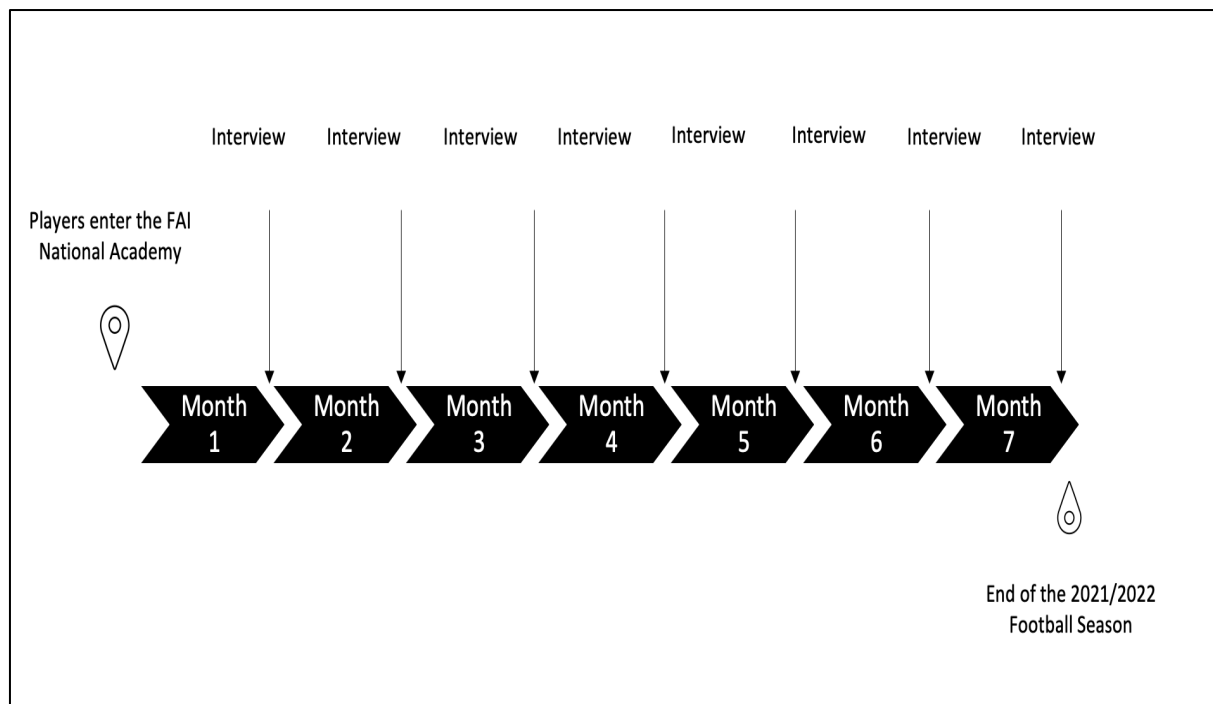


Figure 8.1. A timeline of the study protocol outlining data collection methods.

### 8.2.5 Data Analysis and Trustworthiness

Analysis was conducted using RTA as recently updated and outlined by Braun & Clarke (2019, 2021, 2022). The use of RTA was considered most appropriate given the emphasis placed on participant meaning underpinned by an overall centralised concept (Braun & Clarke, 2019, 2021). RTA differs from other forms of thematic analysis, such as coding reliability or codebook approaches, as the process is reflexive and acknowledges the active meaning making of the researcher. Themes are actively generated through thoughtful, comprehensive, and considerable engagement with the data based upon the researcher's values, experiences, and

research experience (Braun & Clarke, 2019, 2021). Researcher subjectivity is regarded to be a resource for research (Braun & Clarke, 2022) and was supported by my positionality as an experienced practitioner within the context under investigation (Chapter 1, section 1.5).

Data analysis was conducted using the six-phased approach to RTA outlined by Braun & Clarke (2019, 2021) with each of the first four phases being conducted on a monthly basis, following each interview. At the first phase of analysis, I manually transcribed each interview verbatim to Microsoft Word (Windows Microsoft, Washington, USA). Documents were re-checked against audio recordings to confirm transcription accuracy and facilitate deep immersion in the data.

At the second phase, systematic open coding of data took place. This produced succinct, but descriptive data relevant to the research questions (for example, initial codes include: 'high training volumes', 'incoherent coaching instructions', 'feeling nervous at the National Academy'). By coding monthly, I was able to conduct monthly member reflections with each player, referring to previous codes, manuscript annotations, and the reflexive journal. Given the reflexive nature of RTA, regular review of the manuscripts and dataset led to codes being continually revised and updated. Throughout coding, previous transcripts (the entire data set to that point) were regularly re-checked and referred to in order to a) assess the validity and relevance of existing codes, and b) to examine for new potential codes as the data set increased (quantitatively with time) and with my ever-increasing familiarisation with the data. Data was predominantly coded inductively in a 'bottom-up' approach with a focus on producing semantic and latent codes closely linked to the research data, and deductive coding was subsequently used to ensure that the codes and subsequent themes produced were relevant to the research questions.

At the third phase, once initial coding had been completed, initial and distinctive themes (e.g., 'high standards', 'difficulty adjusting to new tactical demands') were generated according

to the shared meaning across codes. Upon review, these initial themes (e.g., 'high standards', 'difficulty adjusting to new tactical demands') were developed and structured into a framework of sub-themes that shared an underlying concept (e.g., 'sharp increase in technical-tactical challenge'). Indeed, RTA is a recursive process, and it is rare that a researcher would follow a linear path through each phase (Byrne, 2022). Thus, the generation of themes (and codes) would take place following each monthly interview for each individual player. Therefore, codes and themes were continually revised and refined on an ongoing basis.

Phase four began following the conclusion of all data collection. At this stage, potential themes were reviewed in relation to the coded data items and the entire dataset (e.g., a review of the relationships between the codes within each sub-theme, theme, and overarching theme, and secondly, a review of the thematic hierarchy in relation to how well they represented the interpretation of the data with consideration to the aims of the research study). In this phase, some themes required revision and were renamed (for example, 'social support of the family' was revised to 'sensemaking through support figures'). Likewise, other themes were collapsed or merged into other sub-themes, whilst other themes were removed from the analysis. For example, 'physical challenges in football' was deemed too general and not representative of the specific issue that the main challenge faced was the volume of football being played, and so was renamed to 'high physical loading'. The high physical loading experienced by players was a result of the incoherent structure of the pathway, and thus, 'high physical loading' was merged as a sub-theme into the theme 'lack of coherence of expectations and processes'. As a method of furthering the trustworthiness of the analysis conducted, at this phase, the supervisory team audited the reflexive analytical process by sense-checking analysis and challenging my generation of themes and sub-themes. This sense-checking and 'critical friend-like' approach to the generation of themes and sub-themes encouraged and deepened reflexivity by providing possible alternative interpretations of data in a way that was

collaborative and flexible, thus achieving richer interpretations of meaning (Braun & Clarke, 2019, 2021). Following this process, again, some themes required revision and were renamed, whilst some themes were integrated as sub-themes into other themes.

Phase five involved the defining and naming of themes. At this phase, each individual theme was reviewed to ensure that it was relevant to the dataset. As part of this process, the final naming of sub-themes, themes and overarching themes were finalised. It was also at this phase where I shortlisted the potential quotes that were to be used within the write up of the study.

The final phase of analysis was the writing of the study. At this phase, I decided in what order the themes would be reported to best illustrate the findings. Following this decision, the results section was written. However, given the reflexive nature of RTA (Braun & Clarke, 2019, 2021), report writing was recursive and woven into the entire process of the analysis. Each phase of analysis was interwoven, where I would reflexively delve into, and out of, each phase in a forward and backwards manner (Braun & Clarke, 2021). The qualitative analysis software (QSR NVIVO-12) was used to assist in the structuring, organising and analysis of raw data into their thematic hierarchies.


## 8.3 Results and Discussion

Following the process of data analysis, three overarching themes were generated ('Factors Evoking the Challenge Experience', 'Fear of Losing Your Spot', and 'I'm Loving It - an Adaptive Developmental Experience'), which are displayed with their associated themes and sub-themes in Table 8.1. Reflecting the individual differences in themes, throughout the results examples from across participants are presented to show similarities and contrasting experiences. Demonstrating the temporal dimensions of lived and reflected upon challenge

experiences, exemplar quotations from players are labelled using a timestamp (Q1: first three months; Q2: middle two months; Q3: final two months of the study, respectively).

**8.3.1 Factors Provoking the Challenge Experience**

Across the season, players experienced a variety of physical, technical, tactical, social, and psychological challenges when entering the national TD system, with a range of factors provoking different degrees of emotional disturbance. A prominent feature of the participant's experience was that all the self-perceived most impactful challenges were football-specific, with challenges faced outside of the sporting domain reported as less impactful and not provoking the same level of emotional disturbance. Crucially, however, the emotional impact of each challenge and the temporal nature of each experience was highly individualised.

*8.3.1.1 High Technical-Tactical Challenge in the National TD System*

A key factor initiating the challenge experience for players was the step up to national-level football. This appeared to be particularly prominent as players transitioned into a new environment where they faced more and higher technical and tactical demands. For some, this initial increase in technical-tactical challenge was a difficult experience: 'It wasn't the most enjoyable experience (…) I didn't really know what I was doing' (Player 3, Q1), but this perception changed quickly within a few sessions: 'I quite like the roll of the way the eight [position] functions in that system; the way they get to pretty much be the box-to-box and the way they get to slip in and out of that attacking eight and defensive eight position, I like that as well' (Player 3, Q2). For others, such as Player 6, this initial sharp increase in technical-tactical challenge was significant at both at the start of the transition to the National Academy: 'it's just completely different. Going from a club where the quality is not great to going to the

nationals where the quality is very high is a massive jump' (Q1) and throughout the programme: '[the players are] just moving the ball around very fast, and at the club it's not really like that. It's just a massive step…a massive one' (Q2). For some players, this was the first time in their football pathway that they had not perceived themselves to be one of the best players in their group.

All the outfield players reported being required to play in new and different positions in the National Academy context. Whilst all players perceived this as challenging, the emotional impact and consequent temporal changes were highly individualised (Taylor et al., 2022b; Williams & MacNamara, 2022). Take, for example, Player 4's experience of being moved to a new playing position in the National Academy:

> I found it quite hard to go back and play it [new playing position] because I was used to going forward and dribbling round a lot (…) I found it a little bit difficult as well because I was playing [position] and I'm just not used to it that much (Q2)

Although perceived as a significant tactical challenge at the start, after a few months and training days, this positional change was no longer viewed as challenging: 'I found it a bit hard at first, but I'm kind of used to it again after playing there for a while again. I'm not really finding it too bad anymore' (Player 4, Q2). After a few more sessions, this positional change was reflected on as a positive experience: 'I think it's [FAI National Academy] been good for me as a player because I've played in quite a few positions' (Player 4, Q2). In contrast, Player 2 immediately embraced the challenge of being played in a new playing position, recognising the learning opportunities that it presented: '[being played in a new position] there is a benefit because you can learn how to get forward and the positions you can make, like the crosses and

where to be. Then when you're centre back, you can see the passes that as a left back you might not see' (Player 2, Q1). Toward the end of the season, Player 2 reflected on the benefits of his early experiences of being exposed to different positions:

> They played me left back again, but I didn't mind it because I had to push forward more (…) he [Coach] wanted me to be up the pitch a bit more, so I kind of knew what to expect and I've played left back quite a bit, so I had a good experience, and I knew what was needed by me (Q2)

In contrast, Player 3 found the experience of being played in a new position early in the programme as immediately challenging and unenjoyable: 'I played left back in one of the games. I don't know how I managed to get there... It was a pretty average day for me' (Q1). In contrast to Player 2 and 4, this perspective did not change. At the end of the year, he reflected on his frustration of being moved out of his favoured position:

> It was very annoying [being moved out of favourite position]. When I was out of midfield it felt like they were breaking the midfield so much easier. I think when they did have a big threat going forward, I think I personally would have made it harder for them to get that far (Player 3, Q2)

Despite the similar nature of the challenge experience, these findings suggest individual factors impacted the response to these positional challenges and such responses were dependent upon the individual's perception of the scale and impact of the challenge (Williams & MacNamara, 2022). Indeed, recent evidence suggests that the perception of the challenge is just as important for emotional impact as the challenge itself (Taylor et al., 2022b; Williams & MacNamara,

2022). Building from this base, no two players experienced the challenge of being moved out of their favoured position in the same way, with the provoked emotional disturbance and temporal response to the challenge a highly individualised matter. The degree to which these challenges were adaptive (or not), therefore, was dependent on the individual.

Following this step up in technical-tactical challenge, players would often use family members to make sense of their experiences (Papastaikoudis et al., 2023; Swainston et al., 2020; Morris et al., 2016) as described by one participant: 'when the game finishes then and I'm driving home with my dad, I ask him what I could have done to prevent it [a goal], and if he tells me something I can do, I bring it into the next game to know what to do and what not to do' (Player 1, Q1). Seeking performance feedback was not delimited to parents or guardians, as Player 6 described how he would seek technical and tactical guidance from his brother (cf. Papastaikoudis et al., 2023):

> He [brother] played with [name] and my brother tells me about him all the time; when I go to his games, he tells me to analyse him and if I'm going to a game, he tells me to watch their centre-backs. He is always trying to bring me on (Q3)

As a consequence of the increased technical and tactical challenge associated with national-level football, players would perceive themselves as making more mistakes, and occasionally, a general sense of underperformance. Players were often critical of their performances in such instances: 'they're more physical and I felt that I should have dealt with it better' (Player 2, Q2). Similar critique can be observed in the reflections of Player 6: 'Just a few times I played it over the top and I really shouldn't have played it over the top' (Q2). For many, this first experience of this sense of underperformance provoked significant emotional disturbance: 'if

they score a goal and it was my fault, I wouldn't feel great. That would last a few hours' (Player 5, Q1). Whereas for others, alternative responses were described following the same experiences: 'if you make a mistake, just move on (…) I don't dwell on them' (Player 1, Q1). For some players, mistakes induced significant negative affect at the time of the event, but upon reflection, were re-evaluated to be important moments for their development. As an example, Player 2 described his initial feeling after a perceived underperformance at the National Academy: 'I was disappointed to lose the games in my head (…) I'm used to playing out passes and then teams are used to playing out different ways, so it's kind of hard to adapt to playing as other teams play. That's what I found hard' (Q1). Just weeks later, when describing the same event, Player 2's perception of this challenge experience had changed; the experience was now retrospectively perceived to have offered the opportunity to learn and refine areas of weakness:

> It was just me that I needed to improve on and personal things that I needed to do better. The coaches are brilliant, and they've always been honest. [Referring to the last national training event] I felt that it was a lesson to learn, so next time I can do even better because I know what things I need to improve on, and I know what I could have done better on the day (Q2)

Regarding the support utilised in the management and response to these challenges, family members were, again, the people to offer support for players (Swainston et al., 2020; Morris et al., 2016; Papastaikoudis et al., 2023). Player 1 described how his parents supported him after a perceived underperformance: 'I was telling my thoughts to my Mum and Dad and just telling them, and they were just reassuring me. So, maybe it [losing] wasn't my fault' (Player 1, Q1). Players actively sought guidance from parents in response to setbacks throughout the season;

for example, Player 3, after a perceived substandard performance late in the season, describes how he went to his father for support and reassurance:

> One thing is that when I'm talking to my dad when I thought I've done something wrong and my dad might agree, when my dad is talking to me about it, it's never just all about the problem, there's always, and it might not be one hundred percent solving the problem, but it's not just critical, critical, critical, there's always 'you could do this' or 'you could do that to get better at it'; there's always a way to counter the problem (Player 3, Q3).

Like the findings of Swainston et al. (2020), the youth players in this investigation also relied heavily on their personal support networks during challenging periods, with limited use of social support from coaches and peers reported by the participants. Indeed, the absence of seeking social support from coaches and peers could be attributed to the fact that players only had one session a month with these individuals and therefore had yet not built the rapport or trust in that network.

Despite the significant technical-tactical challenges posed by the step up to national-level football, players would more often discuss the benefits that it presented, describing the challenge as something to embrace rather than avoid:

> Every time I go to a training session in soccer it always pushes me, but that's a good thing to be honest, I need a challenge because if I'm competing with other players up there in the national academy, I need a challenge and I need to keep up at that level (Player 1, Q1)

*8.3.1.2 Low Levels of Regular Challenge Outside the National Context*

The importance of experiencing appropriate levels of challenge throughout development is well established (e.g., Collins & MacNamara, 2012; MacNamara et al., 2010a, 2010b; Savage et al., 2017, 2022; Taylor et al., 2022a, 2022b; Taylor & Collins, 2019, 2020, 2021). As outlined in Chapter 3, selection into the formalised talent pathways of professional football clubs in Ireland begins at age 13 years (one year after the FAI National Academy begins). Whilst the jump to the national level presented participants with sustained challenge experiences through the season in that environment, they simultaneously reported a drop in competitive challenge levels outside of the national context (i.e., in their clubs). This is particularly significant given that players at this stage of the pathway spend the majority of their development time and contact hours in their schoolboy (grassroots) club, rather than in the National Academy or other academy settings. Illustrating this, Player 5 reflected on his perceptions of the marked differences in challenge levels between the club and national level both at the start of the season: 'the standard of play is not as good [at the club]. Playing out from the back and stuff like that, we don't really do that' (Q1) and end of the season: 'everything really; technically, tactically, physically, mentally. Everything's better than where I'm playing at right now. It's just the jump; you're not expecting the players to be as good as they are [at the national level] because you're playing at a low level' (Q3). Such feelings of frustration were noted by other players, such as Player 3 when discussing the level and nature of competition and learning experienced in his club: 'You're not really learning anything. When you can beat them at a certain standard and you can beat them comfortably at that standard, you're not really pushed to raise it and when you're not pushed to raise it, you're either gonna fall or it will stay the same, so there isn't much you can take from those games' (Q1). This level of frustration was consistent across the season and the cohort, even where coaches were taking active steps to try and increase the challenge level for players:

It's quite annoying because sometimes [at the club] we're beating teams 8-0 and our manager would put limits on the games, like we have to make ten passes in the other teams' half and then you can go and score. We played another team, and we were beating them 13-0 and then we could only use our bad foot on one touch. They're some of the limits we got put on us. That's why I'd rather the hard games because there's more of a challenge and its beneficial to me and my team (Player 2, Q3)

Of course, the reductions in the competitive challenge levels experienced in the club environment may be a consequence of the National Academy experience. As a result of what was described as a gulf between the two contexts, players described the frustration and lack of enjoyment of playing with lower-level peers in competitive situations in their clubs: 'you do a lot of work and then you give the ball to someone, and they lose it and it's annoying. You're sort of just doing the work for them' (Player 6, Q1). It seemed that this frustration grew for the National Academy players as they progressed through the season, with Player 6 noting that 'it can be a bit annoying because at the nationals, every time you pass to someone you can trust them to control it, but sometimes at the club you're almost like 'can he do this?' (Q2). This highlights one of the many dilemmas for those seeking to develop TD systems (Taylor et al., 2022c). The desire to keep young Irish players involved in the community game by delaying selection into formalised club pathways until age 13 potentially risks the provision of a lack of appropriate competitive challenge for those who are relatively good performers (Collins & MacNamara, 2012). This is not to say that the players did not experience *any* challenge outside of the national context, but rather that these challenges were not perceived as significant as those experienced within the national context. On the other hand, the removal of players from the community game and into selective talent systems potentially denies those who are not

selected with high quality development opportunities (cf. Erikstad et al., 2021). Ultimately, when it comes to 'appropriate' youth selection processes, as suggested in Chapters 3 and 7, there are no simple solutions. The range of biopsychosocial influences that need consideration should be framed at both the individual and systemic level (cf. Bailey et al., 2010). It is also important to note that by the end of the season, all six players were either signed for/on trial at academies of professional football clubs in Ireland; with five of the six players no longer formally affiliated with the local clubs they were members of during this investigation.

### 8.3.1.3 Lack of Coherence of Expectations and Processes

In this study, players described a sense of incoherence across their different football environments. In this regard, players discussed the different coaching approaches, training design and levels of competition experience in different contexts (i.e., club and national). Of course, breadth and range of experiences is an important feature of a developmental diet (Webb et al., 2016); it may be that this incoherence was especially challenging for these young players as they were at the very start of their journey and did not have the experience or skills to manage this complexity. The challenge for participants was that their experience across contexts was incoherent, unplanned, unstructured, and in some instances directly contradictory: 'the stuff they're [FAI National Academy coaches] teaching you is just completely different to what they're teaching you at the club (…) it gets confusing sometimes' (Player 6, Q1). These experiences support the findings in Chapter 4 where key stakeholders highlighted the incoherent nature of the Irish football pathway. Supporting this, the players in this study reported a lack of coherence of expectations and processes between different contexts of the pathway. For example, Player 5 reflected upon these challenges between the club and national context after just one month in the national TD system:

> They [new National Academy coaches] tell me different things that I wouldn't normally do [compared to club coaches], but I suppose that's better for me because they know what they're doing (…) I'm not sure what to do sometimes. You have to be really concentrated and know where you are (Q1)

These incoherent experiences were a consistent feature of player's experiences throughout the year, as Player 5 later described feelings of frustration again in the following months: 'it's annoying because you're used to playing out [at the national level], but then [in the local club] they just want you to get it [the ball] out and get it up the pitch' (Q1). This perceived lack of ambition in playing style both frustrated the players and was perceived to limit their opportunities for further development. Players also reported contradictory coaching across different settings with the perception that their club coaching limited their development:

> Sometimes the ball would be somewhere and you kind of remember something or with muscle memory you just do something and then you remember that you were supposed to do something else. You're so used to doing one thing but then you remember that you're not actually supposed to be doing it (Player 4, Q1)

This issue in the context of these particular players is the extent of the variability, with a lack of consistency in the perceptions and behaviours of the coaches across the players' pathway (Taylor et al., 2022d). Players also described a lack of integrated practice and incoherence within the same environment: 'with my club, I have three different coaches and almost every coach does a different thing (…) for the first few months I found it a bit difficult because you're hearing one thing from this side and another thing from the other side' (Player 3, Q1).

Reflecting this incoherence, upon entering the national system, each player was still typically engaged in football across a multitude of different, often competing, environments including at school, club (in multiple age groups), district, regional and national level. A consequence being *high physical loading* throughout the season:

> On Monday I train with the school team after school, and after that with my local club, then on Tuesday with [academy club], Wednesday I have the regional FAI centre [training], on Thursday I'm with [academy club] again, then on Friday I have strength and conditioning with my coach (…) and then I have a match on the Saturday, and then on the Sunday I play for the club side the year up; they normally call me up. That's what my week looks like really (Player 6, Q2)

At this point, it is important to note that Peak Height Velocity (period where the fastest rate in growth of standing stature occurs) is estimated to occur between 85-96% of predicted adult stature (Parr et al., 2020b). During the season under investigation, all players went through Peak Height Velocity (i.e., were between 85-96% predicted adult stature). During Peak Height Velocity, athletes are at an increased risk of sustaining an overuse or growth-related injury (Johnson et al., 2020; Towlson et al., 2021). This, in part, is suggested to be due to changes in joint stiffness, bone density, and imbalances between strength and flexibility, coincided with periods of rapid growth in stature where trunk and lower limb length have increased, but soft tissues have yet to adapt to the size and weight of the frame (Towlson et al., 2021). Thus, all players were exposed to high volumes of football training and competition during a developmental period in which the risk of sustaining an overuse or growth-related injury was at its highest (Johnson et al., 2020; Towlson et al., 2021). Player 2 described how these high

training volumes were having a detrimental impact on his well-being even at early stages of the season:

> I'm feeling tired to be honest. I think I need a tiny break just for two days or something just to get me back on track because we've played a lot of football with my team. We've played maybe ten games in a month (…) I've been playing matches with my school, it's all very hard for me to recover because I'm playing so many things and thinking about so many things (Player 2, Q1)

Player 3 explained how these significant physical loads were becoming increasingly detrimental as the season progressed: 'well, it's almost been even worse for the last four weeks or so. It's nearly been four games a week' (Q1). As a result, he later described how he was forced to adapt how he plays to mitigate the consequences of these physical loads:

> I would feel good at the start, but I could feel myself getting tired quicker and quicker and quicker in games. What I did learn is, I learned how to let the ball do the work. I think its matured me; knowing how to cope with playing Tuesday, Thursday, Saturday, Sunday (Q1)

Reflecting on this issue at the end of the season, this negative perception of the impact of high physical loading had not changed: 'it was pretty difficult. Some of the games, especially at the end of the season, you were going out there and you didn't feel 100% because you had a game two days ago. Your body just hasn't recovered' (Player 3, Q3). Thus, the incoherent and numerous actors in the players' sphere, and a lack of connectedness and communication between them, meant that players reported high training and competition loads (cf. Bjørndal et

al., 2017). During one week, players could be engaged in football activities across six different environments with six different coaches. Importantly, these week-to-week demands were not imposed by the National Academy, they were instead a result of the number of football environments that players were a part of. Similar to the findings in Norwegian handball, the unintended consequences of the heterarchical structure within the Irish system presented players with an incoherent experience, characterised by high training volumes (cf. Bjørndal et al., 2017). It is also important to note that players were also engaging in other physical activity and sporting commitments, for example Physical Education lessons: 'on Wednesday and Friday [at school] we do an hour of different sports each week' (Player 4, Q1). Outside of the school context, Players 1, 2 and 3 did not participate in any other sports, whilst players 4, 5 and 6 reported in engaging in Gaelic Games occasionally at a recreational level throughout the season: 'I don't really train in the hurling much, but I have played three or four matches in the last two months maybe' (Player 4, Q1). For those who did participate in another sport, this engagement was considered by players to be secondary, but still a significant additional commitment with another setting exercising a level of influence:

> I'd only play a game [of Gaelic football], only one game a week. Also, again, my [Gaelic Football] coaches know I have a lot of football on so they say I don't have to go to the training, they just say I can just play the matches or if we're playing a weak team in the Gaelic, he says that I don't have to play because it will make me more tired (Player 6, Q1)

Thus, the data presented here add to the complex nature of the decisions that might be taken at this stage of the talent system outlined in Chapter 3. Whilst there appear some benefits to engaging with multiple sports (Jayanthi et al., 2013; DiFiori et al., 2014) and in the context of

your local peers, the experiences of these players highlights that there are no simple solutions. Reiterating the findings of Chapter 3, the long-term benefits of either approach in respect to developing senior professional footballers remain unclear.

*8.3.1.4 Injury and Illness*

Perhaps unsurprisingly, given the extent of the playing and training loads reported, most players reported injury and/or illness as one of the most significant negative experiences that they faced over the season (Papastaikoudis et al., 2023). These injuries caused players to miss considerable periods of training as well as significant developmental events, including trials and selections. Yet, no two players experienced injury in the same way. For example, Player 6 reported feelings of uncertainty and frustration over how best to manage the injury and a perceived lack of control soon after the incident:

> It's been quiet, it really has just been the injury. It has been pretty annoying. I haven't went [sic] through this sort of injury. I never really have injuries where I'm really out for this long. Obviously I'm never out this long, so it is sort of pretty negative (Q2)

Player 6 described how his parents provided support during this challenge experience: 'my dad was talking to me and letting me know that it was okay, and I didn't need to worry. He knows a bit more than me about it and he just makes me feel more comfortable' (Q2). Reflecting on the experience toward the end of the season, the negative perspective of the impact of this injury had, however, not changed: 'it was very disappointing. In the summer as well when you do a lot of…play football and that was eliminated. You couldn't do anything really; you just had to sit there and watch them [teammates] do it' (Q2).  Player 1, who experienced a similar

injury causing the same missed opportunities, had a similar perception of his injury at the time of the incident:

> I was devastated. It's a very big thing for me now; that's the build-up at the end of the month and the time to show what you're made of each month, and you get to train for that. It was weird. I was training all the way up and then got injured and then I'm thinking about whether I can go or not (Q1)

However, when discussing the same injury later on in the season, he described how with time and reflection, the injury had prepared him for similar challenges in the future, and despite initial negative perceptions, was an important moment in his long-term development: 'the experience I've gained from it though [the injury], I'll know what to do the next time I have an injury' (Player 1, Q3). In further contrast, whilst missing national trials through long-term injury, Player 2 explained how such a negative experience led to a period of reflection, followed by an immediate increase in motivation and a subsequent successful navigation of the challenge:

> I missed the Ireland trials, and I wasn't happy with that. I felt disappointed because I didn't know whether I would be called to another one. I was quite disappointed, but I learned from that. After the operation, I did my best and worked my hardest and then I got called back for another session (Q1)

In this sense, what appeared to be adaptive was not the challenge itself, but the perception and response of the player to the challenge. Indeed, whilst injury in some players evoked an instant negative emotional disturbance and an immediate reaction, for others the response was

prolonged. Similarly, whilst injury was not perceived by some players as impactful for development at the time of the event, upon reflection (at later points of the data collection), it was perceived as more impactful and playing an important role in self-development.

## 8.3.2 Fear of Losing Your Spot

### 8.3.2.1 Pressures of Judgement

A lack of psychological safety in the National Academy environment was a prominent and constant factor for all players. Specifically, key themes identified included performance anxiety and sustained competition for places. The consequences of a lack of safety were expressed immediately upon entering the programme: 'I was a little bit nervous because I didn't know what to expect, but I tried to express myself as good [sic] as I could, but I felt that I could have expressed myself a little bit more…[I need] to make sure that I make use of this great opportunity that I have been given' (Player 1, Q1). Similar to previous research, a driver of this lack of safety was the judgement conferred by the regular selection and deselection decisions (Taylor et al., 2022a). The fear of deselection was consistently reported by each participant, with Player 1 summarising it with the following quotation:

> Will I be invited back? Will I not? It's kind of a nervous thing. Even if I did really well in a session, I'd still be nervous, like maybe I did something wrong that I'm not aware of (Q3)

This sustained competition for places and the monthly selection and deselection procedures were central in engineering this lack of safety, with players uncertain of their place in the system on a month-to-month basis:

No matter how good I feel about how I did in the last one, there's always that voice in the back of your head that says, 'it's not 100% yet'. When I get that email [invited back to the next training event], it's just a breath of fresh air (Player 3, Q3)

English academy players have previously described feelings of fear over losing their place in the academy and anxiousness over deselection (Sothern & O'Gorman, 2021). Similarly, non-English players recruited into English Premier League academies have discussed difficulties in managing the pressure of having to perform and prove themselves consistently to coaches (Hem et al., 2022). Such feelings appeared to be inherent to the national-level experience for the players examined in this study. After months in the programme, this lack of safety persisted: 'I'm happy to still be there, but the pressures on because people are still getting dropped every month, so I just need to keep trying my best' (Player 5, Q2). At the end of the season, players would regularly describe how they were unsure whether they were going to be invited back for the last few sessions: 'it's about trying to stay in it and make a good impression; that's what you worry about really. I hope that I can get called back to the last few' (Player 4, Q3). Similar concerns were expressed by Player 6: 'you always have to work hard each session because you never know, it might be your last one' (Q3). This sustained competition for places also provoked a competitive nature in the players. Take, for example, Player 3's description of his mentality to retain his place in light of the regular deselection procedures within the TD system:

It's kind of like everybody is going for the same thing, so you just know that everybody…you can be friends or even best friends with people, but you have to remember that everybody is there for a reason and 99% of them will take your spot on the team to put their spot on the team (Q2)

218

For some players, selection was reflected on as being a motivating and adaptive feature of their experience. Player 2 described how the competition for places was driving internal focus and motivation:

> I like it though because it's good competition for places and I like that. You have to give one hundred percent every game or else someone can just take your spot, so you have to stay focussed and give one hundred percent every game (Q2)

Yet, this was not a universal perception. Player 6 reflected on how the impact of selection actively limited his exploratory behaviour during training sessions, with a distinction drawn with other environments that he played in: 'maybe because it's the nationals and it is Ireland U13s and it's just like 'oh I might not do that pass in case I make a mistake or something'. It's weird because my confidence is normally one of my good things, but when I go down there, it's just like not as good' (Q3).

With the pressures of selection, individual perceptions of a lack of safety were also driven by peer comparison and intra-group comparison (cf. Taylor et al., 2022a). Similarly, because of the uncertainty of selection and the perceived importance of performing well, feelings of pressure were regularly described by players: 'the intensity has been raised (…) there was constant pressure' (Player 1, Q2). Players suggested that rather than coaches actively increasing pressure, the lack of clarity regarding their status in the group led to individual perceptions of a lack of safety that persisted throughout the year:

> I still feel like there's pressure to perform. No one is really putting pressure on you to perform week in, week out, but we feel like we have pressure going down [to the

national events]. Once you play the first game, it's grand. It is just me being hard on myself, like what if I don't perform? (Player 6, Q3)

Thus, whilst coaches were never reported as deliberately using selection as a tool to pressurise players, it was instead the lack of clarity regarding each player's position and status in the group and the extent to which errors would influence selection that contributed to the feelings of a lack of safety. Importantly, however, not at any point during the year did any player state that they felt that they were not able to speak up to their coaches to ask questions, or voice their opinions or concerns (Edmondson, 2019). This would further question the contextual applicability of psychological safety as an entire concept in selection settings (cf. Taylor et al., 2022a). However, this finding should also be treated with caution given the obvious difference in power dynamics between a coach and U13 player (Cushion & Jones, 2006). It must also be acknowledged that players spent just one day a month with coaches in the national context, and this differs from the contact hours between players and coaches in the academy setting (e.g., Read et al., 2016) or those players and coaches in the senior football context (e.g., Swainston et al., 2020).

### 8.3.3 "I'm Loving It" - An Adaptive Developmental Experience

*8.3.3.1 Learning and Development Experience*

Despite the challenges faced and the lack of psychological safety inherent in the national TD system, all players reflected on a global sense of meaning and enjoyment from the unique opportunity of the National Academy experience. This theme was apparent for all players throughout the season, despite challenges. A key driver being the impact of the programme on their personal development: 'I think I also kind of learn something new every time I go up

there, so there are different points just to take away from each time I'm up there' (Player 4, Q2). Player 1 reiterated these perceptions after his first few sessions: 'being called up for the national academy and having an opportunity to train and play with the best, it's a huge privilege and I'm loving it' (Q1). Reflecting on these experiences at the end of the year, Player 1 later summarised his experience:

> My personal experience with the last twelve months in my journey with the national academy has been an experience that I will always remember and something that I know that I have been privileged to be part of such an excellent set-up. Somewhere I know that I will take all the information that I have learned and use it to the best of my ability (Player 1, Q3)

Players described how they perceived their experience to be beneficial in the long-term: 'I really like the coaches, and everything is well organised. It's had a positive effect on me, even just playing against better players once a month gives you a perspective about how good the players are. Without that, I wouldn't have developed as much and thought about these new things' (Player 4, Q3).

Alongside the perception of an adaptive developmental experience, being within such a selective national TD system elicited feelings of pride for all players. This was consistent across players from rural areas: 'I'm proud that I'm representing my county, myself, I'm representing my friends, my school, my parents, my family, my area; it's brilliant' (Player 1, Q3) and urban areas alike: 'I have as much pride as you can get. I feel like I've made the first step on the ladder to international football. I'm pretty much the most [names city in Ireland] person you'll ever meet in your life' (Player 3, Q3)

221

**Table 8.1**. The overarching themes, themes, and sub-themes produced from the RTA, presented across time and individuals to demonstrate the individual and temporal nature of the challenge experience.

| Overarching Theme | Theme | Sub-theme | Raw data examples | |
|---|---|---|---|---|
| | | | **Temporal differences** (Horizontal) ⟶ | |
| Factors evoking the challenge experience | Sharp increase in technical-tactical challenge | High standards | [the standards were] surprising, they're [the players] as good as me and some might be better (Player 5, Q1) | I'm looking forward to it anyway. I'm excited and I just want to play good. You get a chance to play and show people how good you are (Player 5, Q3) |
| | | | it's just completely different. Going from a club where the quality is not great to going to the nationals where the quality is very high is a massive jump (Player 6, Q1) | [the players are] just moving the ball around very fast, and at the club it's not really like that. It's just a massive step…a massive one (Player 6, Q2) |

| | | | Difficulty adjusting to new tactical demands | It wasn't the most enjoyable experience (…) I didn't really know what I was doing (Player 3, Q1) | I quite like the roll of the way the eight functions in that system; the way they get to pretty much be the box-to-box and the way they get to slip in and out of that attacking eight and defensive eight position, I like that as well (Player 3, Q2) |
| | | | | I found it quite hard to go back and play it [new playing position] because I was used to going forward and dribbling round a lot (…) I found it a little bit difficult as well because I was playing as a six and I'm just not used to it that much (Player 4, Q2) | I found it a bit hard at first, but I'm kind of used to it again after playing there for a while again. I'm not really finding it too bad anymore (Player 4, Q2) |

| | | | | |
|---|---|---|---|---|
| | Injury and illness | Experiencing injury and/or illness | It's been quiet, it really has just been the injury. It has been pretty annoying. I haven't went through this sort of injury. I never really have injuries where I'm really out for this long. Obviously I'm never out this long, so it is sort of pretty negative (Player 6, Q2) | It [the injury] was very disappointing. In the summer as well when you do a lot of…play football and that was eliminated. You couldn't do anything really, you just had to sit there and watch them [teammates] do it (Player 6, Q2) |
| | | | I was devastated. It's a very big thing for me now; that's the build-up at the end of the month and the time to show what you're made of each month and you get to train for that. It was weird. I was training all the way up and then got injured and then I'm thinking about whether I can go or not (Player 1, Q1) | The experience I've gained from it though, I'll know what to do the next time I have an injury (Player 1, Q3) |

| | Low levels of challenge outside the national context | Levels of consistent challenge in the community context | The standard of play is not as good [at the club]. Playing out from the back and stuff like that, we don't really do that (Player 5, Q1) | Everything really; technically, tactically, physically, mentally. Everything's better than where I'm playing at right now. It's just the jump; you're not expecting the players to be as good as they are [at the national level] because you're playing at a low level (Player 5, Q3) |
| | | | You do a lot of work and then you give the ball to someone and they lose it and it's annoying. You're sort of just doing the work for them (Player 6, Q1). | It can be a bit annoying because at the nationals, every time you pass to someone you can trust them to control it, but sometimes at the club you're almost like 'can he do this?' (Player 6, Q2) |

| | Lack of coherence of expectations and processes | Confusing and contradictory messaging across environments | They [new National Academy coaches] tell me different things that I wouldn't normally do (Player 5, Q1) | They [coaches] just do their own thing. It's tricky enough talking to all the managers (Player 5, Q1) |
| | | | You're so used to doing one thing but then you remember that you're not actually supposed to be doing it. It can be a bit challenging (Player 4, Q1) | The coaching is probably quite different. It's probably focusing a bit more on the technical aspects really; the on the ball stuff (Player 4, Q2) |

| | | | | |
|---|---|---|---|---|
| | | High physical loading | Well, it's almost been even worse for the last four weeks or so. It's nearly been four games a week (Player 3, Q1) | Some of the games, especially at the end of the season, you were going out there and you didn't feel 100% because you had a game two days ago. Your body just hasn't recovered (Player 3, Q3) |
| | | | Other times I have had four or five things each day after each other and at the end of that four or five day period I can be quite sore sometimes (Player 4, Q1) | Some days I have school training and that can be on in the morning around eight or half seven, and then I might have two sessions in a day and then school (…) some of the days I can be a bit tired (Player 4, Q3) |

| | | | | |
|---|---|---|---|---|
| | Navigating the challenge | Deploying psycho-behavioural skills | What I would do is, I think I would change the negative into a positive. Let's just say I make a mistake, so I know what to do and what not to do then as well (…) I benefit from mistakes if you kind of get me, because I'm learning so much (Player 1, Q1) | I did my part, and it just shows the quality that you have to be at, so I've been training really hard to try and reach that (Player 1, Q3) |
| | | | When you leave, you think back to when you were playing and wonder if you could have done better and whether you could have played a better pass or made a better decision. I do think about what I could have done and what I did right, but also what I did not so well (Player 4, Q1) | I still kind of reflect and think to myself. I think of the good things that I did and try to keep doing them. Also, I look for the small details with the things I didn't do the best, even if there aren't many I look for them (Player 4, Q1) |

| | | | | I was telling me thoughts to my Mum and Dad and just telling them, and they were just reassuring me. So, maybe it wasn't my fault (Player 1, Q1) | Always after the event on the way home we always have a discussion on what I could have done and what I need to improve on. My Dad is the main character there to be honest (Player 1, Q3) |
|---|---|---|---|---|---|
| | | | Sensemaking through support figures | We've [the family] been talking about the experience and even my brother as well; my brother was talking about how good I played and everything like that (Player 6, Q2) | He [brother] played with [name] and my brother tells me about him all the time; when I go to his games, he tells me to analyse him and if I'm going to a game he tells me to watch their centre-backs. He is always trying to bring me on (Player 6, Q3) |

| Fear of losing your spot | Pressures of Judgement | Performance anxiety | I was a little bit nervous because I didn't know what to expect, but I tried to express myself as good as I could, but I felt that I could have expressed myself a little bit more (…) [I need] to make sure that I make use of this great opportunity that I have been given" (Player 1, Q1) | Will I be invited back? Will I not? It's kind of a nervous thing. Even if I did really well in a session, I'd still be nervous, like maybe I did something wrong that I'm not aware of." (Player 1, Q3) |
|---|---|---|---|---|
| | | | The most nervous is probably the night before and there are a little bit of nerves driving to it (Player 3, Q1) | On each one, I don't think I ever said that I wasn't nervous (Player 3, Q3) |

| | | Sustained competition for places | I'm happy to still be here, but the pressures on because people are still getting dropped every month (Player 5, Q2) | People that are there are good players and if you don't perform, they [coaches] won't think you're as good as people said. If you make a mistake, you also don't feel great. I want to stay in the programme for as long as I can (Player 5, Q3) |
|---|---|---|---|---|
| | | | Everybody is there for a reason and 99% of them will take your spot on the team to put their spot on the team (Player 3, Q2) | The numbers got cut down, so the quality of our age has gone up (Player 3, Q3) |
| "I'm loving it" - An adaptive developmental experience | A positive learning experience | Sense of pride | I love to represent my country; it would make me so proud, and I'd take any chance I have (Player 2, Q1) | I just think it's a privilege to be called up to train with Ireland. I think you need to take in every moment and perform to the best of your ability because you don't get |

| | | | | them chances all the time (Player 2, Q3) |
|---|---|---|---|---|
| | | | I think it's very good. I'm kind of a little bit proud that I'm still in it (Player 1, Q2) | It's kind of unusual to see a [location] player doing so well and keeping it up there, so I'm so proud because it's kind of unheard of a little bit (Player 1, Q3) |
| | | Enjoyment of the experience | Being called up for the national academy and having an opportunity to train and play with the best, it's a huge privilege and I'm loving it (Player 1, Q1) | My personal experience with the last twelve months in my journey with the national academy has been an experience that I will always remember and something that I know that I have been privileged to be part of such an excellent set-up (Player 1, Q3) |

| | | | | |
|---|---|---|---|---|
| | | | I thought it was a brilliant experience. I felt that I was there to work hard and I was just trying to improve. In the games, they were very tough and I enjoyed it, that's the main thing. I enjoyed the training and the matches (Player 2, Q1) | There's no bad parts. I've enjoyed every minute of it (Player 2, Q3) |
| | | Shaping development | I think I also kind of learn something new every time I go up there, so there are different points just to take away from each time I'm up there (Player 4, Q2) | Without that [FAI National Academy], I wouldn't have developed as much and thought about these new things (Player 4, Q3). |
| | | | The experience I've gained from it [The FAI National Academy session] has been absolutely outstanding (Player 1, Q2) | The experience and the improvement that I think I've gotten is really good. The level is unreal and it's great to see what it's like (Player 1, Q3) |

## 8.4 General Discussion

The purpose of this investigation was to explore the temporal impact of perceived challenges and psychological safety on the development of youth football players upon their entrance into, and first season in, the FAI's national TD system. It is well established that the TD process for young athletes is complex, dynamic, and non-linear (Abbott et al., 2005). This is particularly evident in a youth football context, with players being recruited into selective and formalised pathways at increasingly younger ages, with a broad range of biopsychosocial factors influencing selection and development (Collins & MacNamara, 2022). The participants in this study, players recruited into the national TD system at twelve years of age, were a notable cohort in several ways. Firstly, there is relatively little literature examining the experiences of young players at this stage of the pathway and secondly, the longitudinal data collection enabled an investigation of how exposure to significant challenge over the season influenced each player's experience. In line with much of the retrospective research on the nature of challenge (e.g., Collins et al., 2016; Savage et al., 2017, 2022; Taylor et al., 2022b), a consistent theme across the sample was that the most impactful challenges were sport-specific, with challenges faced outside of the sporting domain seemingly less impactful and not provoking significant emotional disturbance.

### 8.4.1 Challenge Experience

This study presents findings relating to young players' engagement with a national system while simultaneously being involved in multiple community sport environments. Players reported experiencing a lack of coherence across their pathway, exposure to high training volumes, and the lack of a coordinator for their individual programme (cf. Bjørndal et al., 2017). Interestingly, players in this investigation were highly aware, and able to offer examples,

of the incoherent messaging and direction that they were receiving across environments. This is perhaps unsurprising given the findings of Chapter 4 where key stakeholders in the TDE also reported similar findings. Indeed, the TD milieu is complex, with multiple stakeholders impacting the development of the athlete both within and across environments. However, across contexts, players described experiencing a range of different coaching instructions and messaging, some of which was contradictory, often leaving them confused and unable to make sense of some experiences. Whilst heterarchical TD structures create an integrated web of activities and actors that provide multiple development opportunities (Bjørndal et al., 2017), a lack of integration across contexts can present a significant challenge for young players. As suggested in Chapter 4, if such a heterarchical TD structure like the one evident in Irish football is to be optimised, the establishment of well-developed and integrated coordination mechanisms and communication between pathway stages is crucial (Bjørndal et al., 2017).

The findings of this study also point to the need for a consideration of the appropriateness of the challenges faced by the players at this stage of an international pathway. Based on the extent of football specific training and the early specialisation criteria outlined by Jayanthi et al. (2015), all the players in the sample would be considered either highly or moderately specialised. Whilst some players had completely excluded participation in all other sports, others devoted most of their sporting activity to football, with the occasional recreational engagement in non-football related activity. Regardless, all players reported very high and unmanaged training volumes as they took part in multiple activities (cf. Bjørndal et al., 2017). This poses a significant challenge, and for the players, not one that could be considered developmentally appropriate. Whilst talent systems are often critiqued for removing players from their community environments (Erikstad et al., 2021), in this instance, where the national system did not have control or influence on other activities, it led to players taking part in high volumes of football related activity; something that the players reported as

challenging. It also meant that players were subjected to a range of different and often incoherent coaching experiences, leaving players frustrated and confused.

When experiencing a series of developmental challenges over the season (e.g., increased technical challenge, adjusting to differential tactical demands, recovering from a minor injury, intra-group competition), players described utilising a range of psycho-behavioural skills (MacNamara et al., 2010a, 2010b). The benefits of deploying these skills have been outlined in Chapter 2. These psycho-behavioural skills included self-reflection, actively seeking social support, and realistic performance evaluation (see section 8.3.1.1 and 8.3.1.4 for examples). In line with the idiosyncratic theme of the findings of this study, players experienced similar events differently and different challenge experiences elicited the deployment of different psycho-behavioural skills (Taylor et al., 2022b). Crucially, however, whilst the deployment of a range of psycho-behavioural skills were perceived to be of benefit during these developmental challenges, players consistently reported difficulties in managing their inappropriate training volumes and the incoherent messaging and direction received by different coaches across contexts. Thus, whilst the development and use of psycho-behavioural skills are one important part of the developing athlete's toolkit (MacNamara et al., 2010a, 2010b), their utility remained limited in face of the systemic challenges posed by the player pathway.

In instances where players could make sense of their appropriate challenge experiences, the challenge *could* lead to an adaptive response and a furthering of development (cf. Taylor et al., 2022b). For instance, players described how exposure to new tactical demands and competing against peers perceived as higher performing presented a significant challenge. Ultimately, these challenge experiences led to an adaptive response in some, stimulating periods of deep reflection and leading to positive change in approach and focus. However, challenge experiences were only an adaptive feature in the learning and development of the

players in the instances where they could make sense of these challenges *and* the extent to which they perceived them as appropriate. Players were highly aware of the incoherent messaging and direction that they were receiving across environments, often leaving them confused and unable to make sense of some experiences (Taylor et al., 2022b), which was further compounded by the frequent exposure to improper training and competition loads (Bjørndal et al., 2017). Players did not perceive these experiences as appropriate for their development, nor did they express a way in which they could navigate these challenges of their own accord.

At this point, it is important to note that all participants in this study were biologically early maturing and part of the same FAI National Academy cohort as those participants in the studies of Chapter 5 and 6. Reflecting on the findings of Chapter 5, however, the FAI National Academy cohort does not consist solely of early biologically maturing players (see section 5.3 and Table 5.2). Thus, although all players in this study were early maturing, they were competing in a national cohort that also consisted of on-time and late biologically maturing players. Despite the early 'push' advantage presented by early biological maturation, the experience of challenge was an omnipresent feature of each player's experience in the national TD system; a system in which they were competing against players of all biological maturation statuses. Specifically, the perception of the challenge, the emotional impact of the challenge, the temporal nature of the challenge, and the adaptive response (or not) to the challenge was highly individualised. As suggested in section 7.5, whilst early biological maturation presents a 'push factor' for young athletes, it is just *one* factor that sits alongside a broad range of other biopsychosocial push and pull factors in development. Ultimately, whilst acknowledging the primary role played in conferring advantage for these players by advanced maturation status, the experience of the National Academy provided players with a range of challenges beyond those that might be presumed as being attendant to physical advantage (e.g., Bradley et al.,

2019; Cumming, Brown et al., 2018). Thus, in respect of the challenge experience, biological maturation status was only part of the broader biopsychosocial context for each player. Another interesting finding in this regard was that (as outlined in section 8.2.3) all of the players perceived by their coaches to be the best current performers (top 25% of the cohort in terms of current performance) relative to their peers in the National Academy were all biologically early maturing.

### 8.4.2 Psychological Safety

A prominent feature of each player's experience was the lack of psychological safety throughout the course of the season. Importantly, rather than players feeling that they could not speak up, question, or ask their coaches for help, it was instead performance related judgement that drove the reported lack of safety (cf. Edmondson, 1999). These experiences must be considered against the age and developmental stage of the players within the programme. All players felt a sense of vulnerability in relation to their position in the TD system and felt that there was a need for them to consistently perform to the required standard. In the event of poor performances, players were fearful that this would count against them and result in deselection. These feelings were consistent as players were aware that selection and deselection decisions were made monthly. As a result, players described feeling psychologically unsafe on a consistent basis, and even those players perceived as the highest performing in the cohort did not describe feeling psychologically safe at any point throughout the year. Whilst this lack of safety was adaptive in some specific instances (e.g., some players described how the sustained competition for places could increase motivation and refine focus), this consistent lack of psychological safety does not appear to be appropriate for the development of youth footballers at early stages of adolescence (Jowett et al., 2023; Taylor et al., 2022a). For example, without

ever feeling psychologically safe, players are unlikely to experiment, take risks or try new skills (Jowett et al., 2023; Taylor et al., 2022a).

Rather than aiming for psychological safety as a universal outcome, Taylor et al. (2022a) have suggested the consideration of psychological safety on a continuum, with differential effects depending on the extent of the lack of safety. With this view, and with appropriate planning, the extent of safety experienced by the athlete could be periodised through the pathway on an individual basis. In as much as it appears desirable for periods of high and low challenge to be pulsed through a pathway based upon individual needs (Taylor et al., 2022b; Taylor & Collins, 2020), a similar principle may apply in the context of psychological safety. For example, taken in the context of this investigation, low levels of safety may be appropriate to refine focus, increase motivation and attention to detail. In other instances, high levels of safety may be appropriate to allow players to experiment, take risks and reduce perceptions of pressure. Whilst the recommendations on psychological safety by Taylor et al. (2022a) present a promising proposition, their utility is likely to remain limited in the context under investigation, given the limited contact time between national coaches and players, the frequent selection and deselection decisions, and the multiple and sometimes conflicting environments in which the players inhabited. This, once again, demonstrates the individual nature of psychological safety and the differences in its applicability in a youth and senior context (Taylor et al., 2022a).

## 8.5 Limitations

Of course, the present study is not without limitations. Whilst the small sample of players allowed for the deep and regular examination of each player's experiences over the season, these experiences are contextually situated within the national level of Irish football's male talent system, with the participant sample representing a very select group of national level

players that had been identified as the most able by their Football Association at the time of selection. Care should, therefore, be taken in reflecting on the transferability to alternative populations (e.g., grassroots, regional level, academy level, non-Irish contexts). There is also a need to acknowledge the power dynamics involved between myself as the lead researcher (an adult embedded within the program in which the players were engaged) and the youth players, who were aged between 12-13 years at the time of investigation. In this regard, there is the potential that some of the responses provided by players were at risk of self-presentation; that is, responses provided by players may have been portrayed in a manner to manage the impressions of the researcher (Arkin et al., 1980). Perhaps most significantly, and reflective of the limitations in research of this nature outlined in Chapter 7, the findings are limited in that they do not provide insight into the experiences of players beyond that of one season, and no indication is provided as to how these challenge dynamics did or did not change and impact development in the longer term through to senior performance, making a longitudinal follow up a desirable next step in this research context.

## 8.6 Conclusion

In Chapter 3, I discussed the need for more prospective research on young footballers' experiences of their TD environment, arguing that the player's voice has been largely absent from the discussion to date. Despite the consistent lack of psychological safety, the significant challenges faced, and the emotional disturbances evoked, all players expressed their enjoyment of the experience and the perceived benefit that the national level TD system had on their development. Players also described how the increased competitive challenge levels were of benefit to them; something that they did not believe they were consistently exposed to in their other environments. Early selection into the national talent pathway also presented players with a consistent lack of psychological safety over the course of the season. This lack of

psychological safety led to feelings of pressure, nerves, and performance anxiety, although this response was individualised. The practical implications of these findings in the Irish football context are discussed in section 9.3.4 and 9.3.5 in Chapter 9. Ultimately, a shift in focus to a more individualised and age and stage appropriate view of psychological safety would appear most appropriate, rather than a blanket suggestion that an entire environment could or should be classified as either 'safe' or 'unsafe' (cf. Taylor et al., 2022a).

Crucially, and reflective of the discussions in Chapter 7, the dynamics of challenge effects are highly individual. Whilst players experienced similar types of challenges over the course of the season, the evoked emotional disturbance, the psycho-behavioural skillset deployed, and the perception and temporal nature of the challenge was a highly individualised matter. In this sense, similar challenge events are not created equal, and challenge experience is representative of the complex, dynamic and individual nature of TD. To mirror the findings of Chapter 7, blanket approaches to the management of challenge will, therefore, be ineffective given the highly individualised, temporal, and biopsychosocial nature of such experiences. The findings of this investigation call for the need for TD systems and practitioners to recognise challenge as a highly individualised biopsychosocial concept and adopt an individualised approach to the management of challenge and psychological safety.

# Chapter 9: Discussion, Practical Implications and Future Directions

## 9.1 Overview of the thesis

The overarching aim of this thesis was to employ a biopsychosocial lens to explore the mechanisms and principles underpinning TD in the FAI's male player pathway. This required a series of prospective, longitudinal, multi-method, and contextually situated studies that examined young Irish players' experiences, skills, supports and challenges. Despite the clear value of such interdisciplinary studies, they have been notably lacking within the TD literature to date (cf. Collins et al., 2019).

Chapter 1 presented an introduction to the thesis. This chapter provided information on the background and significance of the research, as well as the overall aims and objectives of the PhD.

Chapter 2 critically reviewed the literature in the areas of talent conceptualisation, identification and development, principles of effective TDEs, early engagement, biological maturation and relative age, and the role of challenge experience in the development of sporting talent. This literature review summarised, synthesised, and discussed the literature, providing a comprehensive overview of the research landscape to date.

Chapter 3 critically synthesised the literature underpinning the early engagement practices of professional football clubs and the extent to which, and how, the pathway can provide the most appropriate starting point for player development.

Chapter 4, the first study in this thesis, examined the extent to which horizontal and vertical stakeholder coherence existed across the FAI's player pathway. This study also examined key stakeholders' alignment to academic TD principles. This was conducted by gathering qualitative data from coaches, parents and members of the FAI engaged at various stages across the pathway.

Chapter 5 quantitatively examined the associations between biological maturation status and relative age and the extent to which their relative selection biases existed across competitive age groups in an analysis of players within the FAI's national TD system.

Chapter 6 investigated the extent to which the selection biases associated with biological maturation status varied according to playing position in an analysis of players within the FAI's national TD system.

Chapter 7 critically reviewed the interventions presented by the extant literature to influence the challenge dynamics associated with biological maturation and relative age. Following this review, practical recommendations and considerations for talent systems regarding the management of these dynamics were provided.

Chapter 8, the final study of the thesis, adopted a qualitative, prospective, and longitudinal research design to explore the temporal impact of perceived challenges and psychological safety on the development of youth football players upon their entrance into, and first season in, the FAI's national talent pathway.

## 9.2 Contributions of this Thesis to the Literature

### 9.2.1 The Football Pathway

To the best of my knowledge, the review described in Chapter 3 of this thesis provides the first published critical review of the literature underpinning the early engagement practices of professional football clubs. The motivation for this review was driven by both the limitations of the research in this area (e.g., domination of retrospective designs, lack of football-specific investigations, lack of longitudinal designs), but perhaps more importantly the need to look beyond the 'early specialisation vs. diversification' debate in youth football. As such, this review represented an initial consideration of an early engagement perspective that reflects the biopsychosocial influences on TD and the socio-political environment that influences decisions about player selection and development.

As discussed throughout this thesis, athlete development is not the responsibility of a single individual within the environment, but rather, it is the collective responsibility of the environment itself (Bjørndal and Ronglan, 2018). Whilst there has been a growing research base that has sought to examine TDEs in a youth football context (e.g., Aalberg & Sæther, 2016; Flatgård et al., 2020; Larsen et al., 2013, 2020), these investigations have predominantly focused on a single football club or age group and have failed to investigate how the broader system impacts across multiple stakeholders engaged in the TD process. In a team sport like football, where the NGB (in this case the FAI) operates in parallel with other organisations and structures, it was important to look at player development from a systemic perspective. As such, Chapter 4 reports the first published exploration of how the design of the FAI's player pathway impacts multiple key stakeholders, including coaches, parents, and management across all stages of the TD system. A lack of horizontal and vertical coherence across the pathway was identified, characterised by inconsistent conceptualisations of the academy system in Ireland and the long-term strategic aims of the FAI, as well as disjointed and

incohesive relationships between different stakeholders. Similar findings have been observed in other youth sporting contexts (e.g., Curran et al., 2021, 2022; Pankhurst et al., 2013; Taylor & Collins, 2021), including within football specifically (Clarke and Harwood, 2014; Harwood et al., 2010; Ivarsson et al., 2015; Relvas et al., 2010).

The lack of vertical coherence and integration in the Irish player pathway was characterised by the poor relationships between schoolboy football and the underage NLs and the FAI and is suggested to be a key factor inhibiting athlete transitions through the pathway (Taylor & Collins, 2020; Relvas et al., 2010). Vertical integration in the FAI's player pathway would see schoolboy football clubs working closely with NL clubs to facilitate the transition of players between the schoolboy level and the academy environment (cf. Webb et al., 2016). Yet, in some instances, there was a perception among stakeholders that these two stages of the pathway were actively avoiding such integration. Moreover, whilst stakeholders across the Irish pathway understood the importance of key TD principles (e.g., a focus on long-term development not short-term success, the importance of providing appropriate challenge, individualised nature of TD), these principles were not perceived to exist in applied practice. Participants were particularly critical of the emphasis that they believed was placed on winning matches (e.g., Martindale et al., 2007) and the lack of appropriate or individualised challenge (e.g., Collins & MacNamara, 2012; Williams & MacNamara, 2022) at the academy level.

There is substantial evidence linking stakeholder coherence and long-term athlete development (Bjørndal & Ronglan, 2018, 2019, 2020; Curran et al., 2021; Henriksen et al., 2010a, 2010b; Martindale et al., 2007; Taylor & Collins, 2021; Webb et al., 2016). There is now a need for future research to identify how appropriate levels of coherence can be established and maintained, further exploring the use of SMM in practice. This may be especially important in complex TD systems with heterarchical structures lacking established system controllers, like that of the FAI.

**9.2.2 Biological Maturation and Relative Age**

A primary concern raised by key stakeholders in Chapter 4 was the perceived selection biases in favour of those with early advantages. Two of the most prominent factors providing early selection advantages in youth football are advanced biological maturation and relative age (Cobley et al., 2009; Hill et al., 2020; Johnson et al., 2017; Lovell et al., 2015; McCarthy et al., 2022; Towlson et al., 2022). To the best of my knowledge, the studies conducted in Chapters 5 and 6 were the first published research investigations to examine how both concepts influence selection dynamics at the (inter)national underage level within a Football Association across successive age groups. Results highlighted the existence of moderate to very large selection biases in favour of early maturing players; a bias that increased in magnitude with chronological age. The magnitude of this selection bias increased to such an extent that by the U15 age group, there were no late maturing players remaining within the FAI's national TD system. Similar findings have been observed in an English Premier League academy context (Hill et al., 2020). Maturation biases were most prominent in the positions most frequently involved in goal scoring situations (i.e., central attacking and defending positions). In contrast, a small to moderate selection bias existed in favour of relatively older players, although remaining relatively stable with chronological age.

Throughout literature and practice, biological maturation and relative age have historically been interpreted as synonymous (e.g., Cobley et al., 2009; Helsen et al., 2005; Mujika et al., 2009; Mann &Van Ginneken, 2017; Musch & Grondin, 2001). The correlational analyses in Chapter 5 demonstrated that relative age was predominantly unrelated to both absolute and relative biological maturation status. Thus, relative age and biological maturity are two independent constructs (Hill et al., 2020; Johnson et al., 2017; Towlson et al., 2022). In addition, an inverse correlation was observed between relative age and relative maturity

status in players selected into the Irish U15 national team. This finding demonstrates that selected players born later in the selection year were generally *more* mature for their age than those born earlier in the selection year in that sample. These findings are in line with that of Figueiredo et al. (2019) who examined the associations between relative age and maturity status in Portuguese youth footballers. The findings of the investigations outlined in Chapters 5 and 6 provide a significant contribution to the literature by demonstrating that biological maturation status and relative age exist and operate independently, influencing selection dynamics to varying magnitudes, in different ways, and at different developmental stages.

### 9.2.3 Challenge Dynamics

Given the impact of relative age and biological maturation on the selection of young players identified in Chapters 4-6, as well as those identified in similar contexts (e.g., Cobley et al., 2009; Gibbs et al., 2012; Hill et al., 2020; Johnson et al., 2017; Kelly et al., 2021; Lovell et al., 2015; McCarthy et al., 2022; Till et al., 2009; Zuber et al., 2016), a key practical question across talent systems and contexts has been how these dynamics should influence practice. As discussed in section 7.1, research into biological maturation and relative age in TD has traditionally tended to focus on the relative make up of selection cohorts within particular talent systems and/or the impact of each respective concept of current performance status (Buchheit & Mendez-Villanueva, 2014; Hill et al., 2020; Johnson et al., 2017; Parr et al., 2020a). Notably lacking, however, has been investigation into how these concepts can be contextualised within the range of complex biopsychosocial factors that impact long-term development at the individual level. As a first in the published literature, Chapter 7 sought to address this critical practical question by reviewing the literature that proposes to negate some of the various selection and challenge dynamics in talent systems. The findings from this chapter describe how the dynamics of challenge effects are highly individual. Despite various interventions

248

proposed to manage challenge dynamics associated with biological maturation and relative age (e.g., bio-banding, birthday banding, age-ordered shirt numbering, selection quotas, corrective adjustments, discrete performance banding (Bennett et al., 2019; Cobley et al., 2009, 2019; Cumming et al., 2017; Helsen et al., 1998, 2000; Kelly et al., 2020; Mann & van Ginneken, 2017; Moran et al., 2022)), the biopsychosocial, individual, and non-linear nature of TD (Abbott et al., 2005; Abbott & Collins, 2004; Collins & MacNamara, 2019; McCarthy et al., 2022) means that there is no 'optimal' approach to challenge management. In essence, what constitutes effective practice is highly contextual and determined by a myriad of factors that extend far beyond date of birth or current maturation status alone.

Building upon the findings presented in Chapter 7, Chapter 8 presented an exploration of the temporal impact of perceived challenges in the development of a sample of players in the FAI's national TD system. As discussed in Chapter 2, research on the role of challenge in the development of high-level sports performers has been dominated by retrospective designs (e.g., Collins et al., 2016; Savage et al., 2017, 2022; Taylor et al., 2022b; Taylor & Collins, 2019) and there has been a lack of prospective and longitudinal research within this domain. There has also been a lack of research specific to the challenge experiences of young football academy players. Of those investigations specific to academy football (e.g., Hem et al., 2022; Sothern & O'Gorman, 2021; Swainston et al., 2020), most have utilised cross sectional designs (e.g., entrance into an academy, transition point, before/after selection/deselection procedures, pre-season) and thus, offer limited perspective on the temporal nature of the challenge experience. Chapter 8 sought to address these limitations (cf. Collins et al., 2019).

All players within the study outlined in Chapter 8 were early biologically maturing. Despite the early advantage presented by early biological maturation, the experience of challenge was an omnipresent feature of all players' experiences, even when competing against early, on time and late maturing players. Across the season, players reported experiencing a

variety of technical and tactical challenges in the national TD system. For instance, players described difficulties adapting to an increase in technical standards and adjusting to different playing positions within the national TD system (e.g., Hem et al., 2022). Such an increase in technical-tactical challenge was perceived by players to contribute to them making more mistakes and underperforming in some instances (e.g., Reeves et al., 2009). Several players also described experiencing an injury as their most significant challenge over the season (Papastaikoudis et al., 2023). During challenge experiences, players would often use family members to make sense of these experiences (Morris et al., 2016; Papastaikoudis et al., 2023; Swainston et al., 2020), with limited use of support from peers and coaches reported (Swainston et al., 2020).

Crucially, however, in this sample of early maturing players, challenge dynamics were highly individual, with the evoked emotional disturbance, the temporal nature, the psycho-behavioural skillset deployed, and the perception of the impact of the challenge a highly individualised matter (Taylor et al., 2022b; Williams & MacNamara, 2022). As suggested in Chapter 7 and 8, blanket approaches to the management of challenge in applied practice will be ineffective given the highly individualised and biopsychosocial nature of such experiences. Although the jump up to national-level football provided players with consistent challenge experiences throughout the year, a drop in challenge levels outside of the national context (i.e., club and school contexts) were reported.

Future research must now seek to clarify how biological maturation influences challenge dynamics and long-term development through to the senior level of performance. Despite the plethora of research investigating the influence of biological maturity on player selection (e.g., Hill et al., 2020, 2021; Johnson et al., 2017; Parr et al., 2020a; Ruf et al., 2021; Zuber et al., 2016), there is a lack of prospective and longitudinal data to indicate how biological maturation influences long-term development from selection into the TD system

through to the senior level. Whilst the study presented in Chapter 8 provides an insight into the challenge dynamics experienced by players in a national TD system, these dynamics were only tracked for one season, and there is no prospective and longitudinal data to indicate how these dynamics play out throughout development through to the professional level.

Whilst the players examined in Chapter 8 described using a range of psycho-behavioural skills during some challenge experiences (MacNamara et al., 2010a; 2010b), players consistently reported difficulties in managing their high training volumes and the incoherent messaging and direction received by different coaches across contexts (Bjørndal et al., 2017). Thus, the findings of Chapter 8 also point to the need for a consideration of the appropriateness of the challenges faced by young players at this stage of an international pathway. Such incoherence led to confusion and players being unable to make sense of some experiences (Taylor et al., 2022b).

### 9.2.4 Psychological Safety

As outlined in Chapter 2, psychological safety is a concept that originally derives from the organisational literature (Edmondson, 1999, 2019). Although inconsistently defined, the concept has recently begun to attract applied and conceptual research attention specific to the sporting context (Jowett et al., 2023; Taylor et al., 2022a; Vella et al., 2022). That said, Taylor et al. (2022a) have questioned the applicability of psychological safety in the sporting context and its transferability from organisational to performance environments.

Taylor et al. (2022a) conducted the only empirical study of psychological safety specific to high-performance sport in a professional rugby context, with a lack of safety being a constant factor in all players' experiences. This lack of safety was predominantly driven by the judgement conferred by selection and deselection decisions. Whilst offering the opportunity for an adaptive response in some players, a lack of safety was significantly fatiguing and long-

term exposure left players feeling exhausted (Taylor et al., 2022a). Yet, this investigation was specifically grounded in the senior elite male rugby union context in the UK. To date, there has been no investigation into the role of psychological safety in the TD context and how the dynamics of selection impact individuals. Thus, the study outlined in Chapter 8 sought to prospectively explore the temporal impact of psychological safety on the development of young Irish players during their first season in the FAI's national TD system.

A prominent feature of each player's experience was the lack of psychological safety in the TD system throughout the course of the season. All players described feelings of vulnerability over their position in the TD system and the perceived need to consistently perform to the required standard. In the event of poor performances, players were fearful that this would count against them and lead to deselection. Although coaches were never reported as intentionally using selection and deselection to manipulate levels of safety, the performance related judgement and the consistent (monthly) selection and deselection decisions associated with the FAI's National TD system appeared to drive the persistent lack of safety in young players. Similar to the findings of Taylor et al. (2022a) in the senior elite sport context, this lack of safety was also driven by peer comparison and intra-group competition. This lack of safety was apparent upon entering the FAI's national TD system and persisted until the end of the year.

Importantly, not at any point throughout the year did players describe feeling unable to speak up to, question, or ask their coaches for help (Edmondson, 2019). Thus, performance related judgement appeared to be the factor that drove the reported lack of safety in this TD context. These findings lend support to the work of Taylor et al. (2022a) and question the utility of the application of psychological safety (e.g., Edmondson, 1999, 2019) in its full form in selective TD settings.

## 9.3 Implications for Practice in Irish Football

As outlined in section 1.6 and reflecting my pragmatic approach to research (cf. Giacobbi et al., 2005), the following section will offer some practical recommendations for the Irish football pathway in respect to appropriate developmental provision for young players.

### 9.3.1 The Pathway Experience

A key aim of the TD process is to provide players with the best possible environment to support their trajectory and development. Nurturing players along a dynamic pathway in environments best suited to their individual needs at particular points of childhood and adolescence requires a system that facilitates multiple entry, exit and re-entry points. This type of coherent development system may seem aspirational given the socio-political context of modern-day football outlined in section 3.2. Nonetheless, the large gap between research theory and sporting practice that exists (cf. Collins et al., 2019; Pankhurst & Collins, 2013) must be addressed and it is the responsibility of those working within the football industry at every level to ensure that the welfare of children is at the forefront of all decision making. If conditions can be created whereby an academy manager feels secure in the knowledge that producing players is not the sole outcome measure, a positive player development model can be woven into academy culture (Mills et al., 2014b). This will require increased collaboration across the football pathway, characterised by vertical and horizontal integration (cf. Chapter 4). At the academy level, it points to the importance of quality coaching that recognises the complexity and dynamic nature of the developmental process (cf. Chapter 2). Sections 9.3.2. 9.3.3 and 9.3.4 will address how this may be established in the Irish context.

### 9.3.2 Establishing a Coherent Player Pathway

As discussed throughout Chapter 1 and 2, it is crucial for football pathways to aim for horizontal and vertical coherence throughout a talent pathway (Martindale et al., 2005, 2007; Pankhurst et al., 2013; Pankhurst & Collins, 2013). Findings from Chapter 4 highlighted the lack of horizontal and vertical coherence. Stakeholders reflected on a maladaptive relationship between schoolboy football clubs and NL academies, characterised by conflict involving player transfers, financial disputes, and dissonant control of player development. This lack of vertical integration was perceived to be intertwined with the poor historical relationship between the FAI and SFAI. The disconnect between the SFAI and the FAI regarding what is best for player development appears a major obstacle for player development in Ireland. The evident lack of integration between schoolboy football clubs and NL academies was exemplified by the lack of shared understanding regarding the purpose of the player pathway. Whilst this shared understanding and vertically coherent player development system ceases to exist, the player development pathway within Irish football is unlikely to be optimised (Mills et al., 2014a).

From a vertical perspective, professional football clubs in Ireland and their associated NL academies must try to collaborate with local grassroots (schoolboy) clubs and schools (Webb et al., 2016). This may include opportunities for players from grassroots clubs and schools to train with the academies of NL partner teams, regular school holiday camps hosted at partner club locations, and regular fixtures between NL academies and schoolboy clubs. A lack of formal communication between youth and professional environments, even within the same club or broader system, can hinder the coherent progression of young players into the professional environment (Relvas et al., 2010). In practical terms, this means that open and clear lines of communication need to exist between stakeholders at different levels of the game (e.g., schoolboy football clubs, underage NL academies, senior NL clubs, the FAI's Emerging Talent Programmes, Irish international underage teams) so that players are supported in their

development as they progress from youth to adult football. The 'rocky road to the top' (Collins & MacNamara, 2012) should be systematic, well-planned, and coherent. TD systems must enable individual players' transition in and across challenging environments in a structured and supportive manner (Webb et al., 2016), with appropriate, well-planned, and periodised developmental challenges and experiences (Collins & MacNamara, 2012). Such a coherent pathway for young players only becomes achievable when all the key stakeholders in the game collaborate for the best interests of players (Martindale et al., 2007).

A lack of horizontal coherence was also apparent at the NL level in the findings presented in Chapter 4, most notably in the relationships between coaches and parents. Parents expressed concerns over the lack of regular and comprehensive communication from coaches, which is a common concern within football academies elsewhere (Clarke & Harwood, 2014; Harwood et al., 2010). On the other hand, coaches explained how parents can often interfere with coaching practices, most notably by providing inappropriate and contradictory coaching advice (Mills et al., 2012). From a horizontal perspective, academy staff across NL clubs must make a conscious effort to spend time developing relationships with parents to provide tailored and continuous support in an environment where parents feel welcomed, valued, and respected (Newport et al., 2021). Moreover, clubs must make an effort to support parents from initial engagement in the pathway to consider how their role can be supportive of their child's development (Harwood et al., 2010; Newport et al., 2021). This could be delivered in the form of parent inductions upon entrance into the academy, followed by educational workshops throughout the year and open and transparent discussions between parents, coaches and academy management staff.

### 9.3.3 Entry into the FAI's TD System

The findings from Chapters 5 and 6 highlighted the existence of moderate to very large selection biases in favour of early maturing players; a bias that increased in magnitude with successive age groups to such an extent that there were no late maturing players remaining in the FAI's national TD system by the U15 cohort. These findings are consistent with similar investigations conducted in the football academy context (e.g., Hill et al., 2020; Johnson et al., 2017), although the magnitude of these biases was variable according to playing position. As discussed in Chapter 7, whilst there are no simple solutions in managing the selection and development dynamics associated with biological maturity, this has significant implications as the findings from Chapter 4 suggest that once excluded access to the TD system in Ireland, there are limited routes back in, and moreover, that there appear to be marked differences in developmental provision between those who are in, or out, of the system.

Since the early physical advantages of early biological maturation are generally no longer present once players reach the age of 18, it is possible that the FAI is reducing the number of high potential players available at the senior level of the game by preferentially selecting from a subset of players who are biologically advanced for their age from 12 years upwards (Johnson et al., 2017). If this process of elimination prevents others (on time and late maturing players) accessing the talent system, or the types of challenge and development necessary for later high performance, this is a flawed strategy. This is an important point because stakeholders in Chapter 4 reported that there is a large drop in the quality of developmental provision and challenge offered between the grassroots game (e.g., SFAI structures) and formal FAI structures. These findings were reinforced by the experiences reported by the players in Chapter 8. However, and reflecting the discussion outlined in Chapters 4 and 8, the heterarchical structure and lack of integration in Irish football's TD system questions the extent to which systemic change at the grassroots level could be

256

implemented. The SFAI operate and govern independently to the FAI, and a lack of vertical integration exists between these two entities (cf. Chapter 4).

There is also a need for the consideration of the psychosocial impact of delimiting selection solely to early maturing players. If later maturing players are unable to cope with the chronically low levels of early selection (as evidenced in the FAI's national TD system in Chapters 5 and 6), the likelihood of those players dropping out of the system is increased (Taylor & Collins, 2020). Indeed, the selection biases in favour of early maturing players may also have implications for the early maturing players themselves. Whilst early maturation will typically lead to several physical, physiological, and functional advantages (e.g., Brown et al., 2017; Buchheit & Mendez-Villanueva, 2014; Gundersen et al., 2022; Malina et al., 2004; Meylan et al., 2010; Radnor et al., 2021), it may also confer enhanced self-efficacy and social status. Crucially, if these advantages dissipate later, there may be maladaptive consequences for early maturing players when exposed to higher levels of challenge at later stages of the pathway (Taylor & Collins, 2019).

It is also important to note that when the Irish national TD system begins at the under 13 level, maturation biases are already prominent. As such, national talent coaches may be selecting players from a population that is already slanted towards early maturing players at this age group, which is then further magnified with chronological age. This is likely given that the overt and physical changes associated with puberty emerge at 11-12 years (Malina et al., 2004). It would seem prudent to examine the biological maturation statuses of young Irish players before the entrance to the national talent pathway (i.e., under 10, 11 and 12), with a focus on Irish clubs and the Emerging Talent Programme at league and regional level (the preceding pathway stages presented in Figure 5.1) to provide a deeper understanding of the role of biological maturity on player selection in Irish football. Although biological maturation is just one factor in a broad range of biopsychosocial variables that impact the TD process

(Chapter 7), routine monitoring of players' biological maturation statuses from late childhood and early adolescence in Irish football could be an important first step to help coaches to be aware of the biological maturity statuses of every player within their care.

### 9.3.4 Challenge Dynamics

Chapter 7 reviewed the literature that has sought to negate the various selection and challenge dynamics associated with biological maturation and relative age in TD systems. As discussed in Chapter 7, the RAE is a population-level consequence of a constellation of factors less measurable than biological maturation alone (cf. McCarthy et al., 2022). In this regard, the RAE appears to be a population-level effect, indicative of a deeper phenomena, rather than having a direct effect on individual challenge levels. In contrast, biological maturation has a direct effect on challenge at the individual level for athletes. However, as the findings presented in Chapter 7 and 8 suggest, biological maturation is just one factor influencing challenge at the individual level for athletes. All the players examined in Chapter 8 were early maturing biologically, competing in an environment with early, on time and late biologically maturing players. Yet, the experience of challenge was an omnipresent feature of each player's experience in the national TD system, with the perception of the challenge, the emotional impact of the challenge, the temporal nature of the challenge, and the adaptive response (or not) to the challenge a highly individualised matter.

For practitioners and TD systems more broadly, challenge mitigation approaches (see sections 7.2 and 7.3) should be used at the individual level, rather than deployed at the academy (macro) or FAI (meso) level. This requires maximum levels of flexibility across the system to allow for practitioners to make decisions on an individual basis and respond to the individual needs of the athlete. The highly individualised and biopsychosocial nature of the challenge experience means that there are no optimal approaches to challenge management, and instead,

an effective approach is highly contextual and dependent upon a range of individual biopsychosocial factors. In practice, there is an opportunity for talent systems, such as the FAI, to adopt a more holistic approach by conceptualising biological maturation and relative age within a broader spectrum of challenge dynamics and considering how other, less-measurable factors also impact athlete development. As discussed in section 7.6.1, this requires an individualised approach to challenge with an understanding of additional push and pull factors beyond that of maturation status or relative age (section 7.5) and how they impact individual talent trajectories, along with the ability of individual practitioners to make effective decisions about what is needed for those individual athletes.

Reflecting these individual challenge dynamics, findings from Chapter 8 suggest that selection into the FAI's national TD system at age 12 offers Ireland's highest potential players with higher challenge levels than that that can be provided across other community contexts. As outlined in Chapter 3, selection into the formalised talent pathways of professional football clubs in Ireland begins at age 13 years (one year after the FAI National Academy begins). Thus, keeping players in the community game by delaying selection into formal FAI development structures until age 13 potentially risks the provision of a lack of appropriate competitive challenge for those players perceived as high performing until such ages (Collins & MacNamara, 2012). On the other hand, the removal of players from the community game and into selective and formalised talent systems from earlier ages is proposed to deny many players with opportunities for long-term engagement and personal development (cf. Erikstad et al., 2021). Ultimately, when it comes to "appropriate" youth selection processes of a Football Association, as suggested in Chapters 3, 7 and 8, there are no simple solutions in this regard and there are a range of biopsychosocial influences that need to be considered (cf. Bailey et al., 2010). The engagement of players across multiple community environments in Ireland appears to be complicated by the lack of coherence across the pathway and the lack of a central

controller (cf. Bjørndal et al., 2017). Adding to the data presented in Chapters 4 and 7, findings highlight the need for the establishment of SMM's and well-developed coordination mechanisms and communication between pathway stages if the pathway experience for Irish players is to be optimised.

**9.3.5 Psychological Safety**

As discussed in section 8.4.2, a consistent lack of psychological safety cannot be considered appropriate for the development of young Irish footballers at the first step of the national TD system (Jowett et al., 2023; Taylor et al., 2022a). Whilst a lack of safety has been an adaptive experience for some in the senior high-performance context (Taylor et al., 2022a), the investigation in Chapter 8 focused on early adolescent players in a national TD programme. Indeed, all players described feeling psychologically unsafe on a consistent basis, and even those players perceived as the highest performing (see section 8.2.3) in the cohort did not describe feeling psychologically safe at any point throughout the year. Without ever feeling psychologically safe, players are unlikely to experiment, take risks or try new skills (Jowett et al., 2023; Taylor et al., 2022a).

Indeed, the research landscape on psychological safety in the sporting context is limited (Jowett et al., 2023) and its practical utility in the high-performance milieu remains unclear (Taylor et al., 2022a). The findings of Chapter 8 suggest that there also appear to be differences in the role and impact of psychological safety between youth and senior sporting contexts (e.g., Taylor et al., 2022a). There are no 'optimal' recommendations on how best to manage or manipulate psychological safety in the TD context (cf. Taylor et al., 2022a). Findings from Chapter 8 suggest that the impact and role of psychological safety in the development of young players is likely to be a highly individualised matter. As suggested in section 8.5, therefore, a shift in focus to a more individualised view of psychological safety would appear most

appropriate, rather than designing or manipulating a TDE to be 'safe' or 'unsafe' (cf. Taylor et al., 2022a). Firstly, however, there is a need for more empirical data to shed light on the role of psychological safety in the development of young athletes. At minimum, there is a need for coaches to recognise the dynamics of working in an environment where people are judged, seeing the difference between sporting and organisational domains (Edmondson, 2019).

The results from Chapter 8 also question the extent to which psychological safety could be manipulated in the FAI's national TD context. In line with section 8.4.2, coaches in the national context only spent one day a month working with players in a system that conducts monthly selection and deselection procedures. In addition, players were still engaged with multiple community (and often conflicting) environments, and in some instances, were under the direct provision of six different coaches over the course of one week. Thus, it would appear unlikely that coaches at the national level could use or manipulate psychological safety in the development of young players in the national TD context. Reflecting on the findings of Chapter 4, it would appear crucial to establish a coherent player pathway, characterised by horizontal and vertical integration (Taylor & Collins, 2020, 2021), before psychological safety could be manipulated for the benefit of young Irish players in the national context.

## 9.4 Limitations of the Thesis

Given that the focus of this research was to produce practically meaningful knowledge to enhance the TD processes within Irish football, Chapters 4, 5, 6 and 8 incorporate research studies that focussed solely on the Irish football player pathway, gathering data and insight into the young players involved and their sociocultural milieu. Whilst these research outputs produced evidence-informed knowledge that can be applied to TD systems, they may be delimited to the Irish football context and may not apply to non-Irish contexts or alternative

sporting pathways. It is up to the reader to consider the transferability of these findings (cf. Burchett et al., 2013) to their specific sporting and cultural context.

The methods used to predict biological maturity status in the investigations conducted in Chapters 5, 6 and 8 utilised the Khamis-Roche method for the percentage of predicted adult height (Khamis & Roche, 1994, 1995). Although this method has demonstrated construct validity as an indicator of biological maturation status in samples of healthy American, German and Portuguese youth (Malina et al., 2007, 2012; Ruf et al., 2021), the median error bounds between actual and predicted adult height using the Khamis-Roche method for those biological males aged between 4 to 17.5 years who are situated in the 50th and 90th normative growth percentiles is 2.2 cm and 5.2 cm, respectively (Khamis & Roche, 1994, 1995). This predictive equation is also derived from samples of American youth of European ancestry, and this must be acknowledged when applied to the Irish population. This limitation (i.e., applying American data based upon Caucasian samples to non-American populations/mixed ethnicities) is often unacknowledged across the football specific literature on biological maturity using the Khamis and Roche equation (e.g., Bradley et al., 2019; Cumming, Brown, et al., 2018; Hill et al., 2021; Johnson et al., 2020).

Parental heights for the prediction of adult height utilised in the studies outlined in Chapters 5, 6 and 8 were self-reported, rather than measured, and subsequently adjusted for overestimation based on the equations outlined by Epstein et al. (1995); this formula is based upon participant samples from the United States. The Z-scores used to derive maturity status from the percentage of predicted adult height are calculated based on participants of European ancestry in the Berkeley Growth Longitudinal Study (Bayer & Bayley, 1960; Khamis & Roche, 1994, 1995). Whilst the participant sample examined in the studies outlined in Chapters 5, 6 and 8 consisted predominantly of European (Irish) Caucasians, this must be noted as a limitation.

Whilst the small sample of players allowed for a rich and sustained examination of each player's journey over the season, the experiences outlined by players in Chapter 8 were contextually situated within the national level of Irish football's male talent system. Care should, therefore, be taken in reflecting on the transferability to alternative populations. The findings outlined in Chapter 8 also do not provide insight into the experiences of players beyond that of one season, and no indication is provided as to how these challenge dynamics did or did not change and impact development in the longer term through to senior performance (cf. Collins et al., 2019).

## 9.5 Conclusion

To conclude, this thesis provides a novel, significant and original contribution to the TD literature through a series of mixed-method, prospective, and longitudinal investigations of a biopsychosocial nature focused on player development in Irish football. A mixed-methods and multi-layered analysis of macro, meso, and micro stages of the pathway was undertaken, allowing for the examination of multiple variables that impact the player development process (i.e., social support structures, challenge dynamics, selection processes, early engagement practices). Since the implementation of significant restructures to the FAI's player pathway, there has been an absence of empirical data to evidence both the short and long-term impact of these modifications on player development in Ireland and the perceptions and understanding of key stakeholders about the experience. The data resulting from this PhD provide evidence-informed information with applied implications to support the refinement of the talent pathway in Irish football, to ultimately ensure that young players across Ireland are provided with optimal opportunities and experiences to fulfil their potential. However, the findings from this PhD have broader implications, and provide practitioners working within TD structures across youth sport with information and considerations to help inform and guide practice.

# References

Aalberg, R. R., & Sæther, S. A. (2016). The Talent Development Environment in a Norwegian top-level football club. *Sport Science Review*, *25*(3–4), 159–182. https://doi.org/10.1515/ssr-2016-0009

Abbott, A., Button, C., Pepping, G.-J., & Collins, D. (2005). Unnatural selection: Talent identification and development in sport. *Nonlinear Dynamics, Psychology, and Life Sciences*, *9*, 61–88.

Abbott, A., & Collins, D. (2002). A Theoretical and Empirical Analysis of a 'State of the Art' Talent Identification Model. *High Ability Studies*, *13*(2), 157–178. https://doi.org/10.1080/1359813022000048798

Abbott, A., & Collins, D. (2004). Eliminating the dichotomy between theory and practice in talent identification and development: Considering the role of psychology. *Journal of Sports Sciences*, *22*(5), 395–408. https://doi.org/10.1080/02640410410001675324

Abbott, W., Williams, S., Brickley, G., & Smeeton, N. (2019). Effects of Bio-Banding upon Physical and Technical Performance during Soccer Competition: A Preliminary Analysis. *Sports*, *7*(8), 193. https://doi.org/10.3390/sports7080193

Abraham, A., & Collins, D. (2011). Taking the Next Step: Ways Forward for Coaching Science. *Quest*, *63*(4), 366–384. https://doi.org/10.1080/00336297.2011.10483687

Andersen, S. S., Bjørndal, C. T., & Ronglan, L. T. (2015). *The ecology of talent development in the Nordic elite sport model. In Managing Elite Sport Systems.* (pp. 49–66). Routledge.

Andrew, M., Finnegan, L., Datson, N., & Dugdale, J. H. (2022). Men Are from Quartile One, Women Are from? Relative Age Effect in European Soccer and the Influence of Age, Success, and Playing Status. *Children*, *9*(11), 1747. https://doi.org/10.3390/children9111747

Arkin, R. M., Appelman, A. J., & Burger, J. M. (1980). Social anxiety, self-presentation, and the self-serving bias in causal attribution. *Journal of Personality and Social Psychology*, *38*(1), 23–35. https://doi.org/10.1037/0022-3514.38.1.23

Ashford, M., Taylor, J., Payne, J., Waldouck, D., & Collins, D. (2023). "Getting on the same page" enhancing team performance with shared mental models—Case studies of evidence informed practice in elite sport. Frontiers in Sports and Active Living, 5, 1057143. https://doi.org/10.3389/fspor.2023.1057143

Bacon, M. (2012). *Pragmatism: An introduction*. Polity.

Badley, G. (2003). The Crisis in Educational Research: A Pragmatic Approach. *European Educational Research Journal*, *2*(2), 296–308. https://doi.org/10.2304/eerj.2003.2.2.7

Bailey, R., Collins, D., Ford, P. R., MacNamara, Á., Toms, M., & Pearce, G. (2010). *Participant Development in Sport: An Academic Literature Review. Commissioned Report for Sports Coach UK. UK Sport.*

Baker, J. (2022). *The tyranny of talent: How it compels and limits athletic achievement... and why you should ignore it*. Aberrant Press.

Baker, J., Cote, J., & Abernethy, B. (2003). Sport-Specific Practice and the Development of Expert Decision-Making in Team Ball Sports. *Journal of Applied Sport Psychology*, *15*(1), 12–25. https://doi.org/10.1080/10413200305400

Baker, J., Côté, J., & Deakin, J. (2005). Expertise in Ultra-Endurance Triathletes Early Sport Involvement, Training Structure, and the Theory of Deliberate Practice. *Journal of Applied Sport Psychology*, *17*(1), 64–78. https://doi.org/10.1080/10413200590907577

Baker, J., Mosher, A., & Fraser-Thomas, J. (2021). Is it too early to condemn early sport specialisation? *British Journal of Sports Medicine*, *55*(3), 179–180. https://doi.org/10.1136/bjsports-2020-102053

Baker, J., Schorer, J., & Wattie, N. (2018). Compromising Talent: Issues in Identifying and Selecting Talent in Sport. *Quest*, *70*(1), 48–63. https://doi.org/10.1080/00336297.2017.1333438

Baker, J., & Wattie, N. (2018). Innate talent in sport: Separating myth from reality. *Current Issues in Sport Science (CISS)*, *3*. https://doi.org/10.36950/2018ciss006

Baker, J., Wattie, N., & Schorer, J. (2019). A proposed conceptualization of talent in sport: The first step in a long and winding road. *Psychology of Sport and Exercise*, *43*, 27–33. https://doi.org/10.1016/j.psychsport.2018.12.016

Barnes, F. B., Fletcher, D., & Neely, K. C. (2021). Stress-Related Growth in Elite Sport Performers: Qualitative Differentiators in Psychosocial Mechanisms. *The Sport Psychologist*, *35*(4), 293–304. https://doi.org/10.1123/tsp.2020-0015

Barraclough, J., Grecic, D., & Harper, D. (2022). Examining the psychological characteristics of developing excellence profiles of male English youth soccer players: Differences across ages and performance levels. *International Journal of Sport and Exercise Psychology*, 1–23. https://doi.org/10.1080/1612197X.2022.2152854

Barth, M., Güllich, A., Macnamara, B. N., & Hambrick, D. Z. (2022). Predictors of Junior Versus Senior Elite Performance are Opposite: A Systematic Review and Meta-Analysis of Participation Patterns. *Sports Medicine*, *52*(6), 1399–1416. https://doi.org/10.1007/s40279-021-01625-4

Bayer, L., & Bayley, N. (1960). Growth Diagnosis: Selected Methods for Interpreting and Predicting Physical Development from One Year to Maturity. *Medical Journal of Australia*, *2*(4), 143–144. https://doi.org/10.5694/j.1326-5377.1960.tb87063.x

Bennett, K. J. M., Vaeyens, R., & Fransen, J. (2019). Creating a framework for talent identification and development in emerging football nations. *Science and Medicine in Football*, *3*(1), 36–42. https://doi.org/10.1080/24733938.2018.1489141

Bergeron, M. F., Mountjoy, M., Armstrong, N., Chia, M., Côté, J., Emery, C. A., Faigenbaum, A., Hall, G., Kriemler, S., Léglise, M., Malina, R. M., Pensgaard, A. M., Sanchez, A., Soligard, T., Sundgot-Borgen, J., van Mechelen, W., Weissensteiner, J. R., & Engebretsen, L. (2015). International Olympic Committee consensus statement on youth athletic development. *British Journal of Sports Medicine*, *49*(13), 843–851. https://doi.org/10.1136/bjsports-2015-094962

Bergkamp, T. L. G., Frencken, W. G. P., Niessen, A. S. M., Meijer, R. R., & den Hartigh, Ruud. J. R. (2022). How soccer scouts identify talented players. *European Journal of Sport Science*, *22*(7), 994–1004. https://doi.org/10.1080/17461391.2021.1916081

Bergkamp, T. L. G., Niessen, A. S. M., den Hartigh, Ruud. J. R., Frencken, W. G. P., & Meijer, R. R. (2019). Methodological Issues in Soccer Talent Identification Research. *Sports Medicine*, *49*(9), 1317–1335. https://doi.org/10.1007/s40279-019-01113-w

Beunen, G. P., Rogol, A. D., & Malina, R. M. (2006). Indicators of Biological Maturation and Secular Changes in Biological Maturation. *Food and Nutrition Bulletin*, *27*(4_suppl5), S244–S256. https://doi.org/10.1177/15648265060274S508

Bjørndal, C., & Ronglan, L. T. (2020). Athlete Development in Norwegian Handball. In *Talent Identification and Development in Sport: International Perspectives; Baker, J., Cobley, S., Schörer, J.* Routledge.

Bjørndal, C., Ronglan, L. T., & Andersen, S. S. (2016). The diversity of developmental paths among youth athletes: A 3-year longitudinal study of Norwegian handball players. *Talent Development and Excellence*, *8*(2), 20–32.

Bjørndal, C. T., Andersen, S. S., & Ronglan, L. T. (2018). Successful and unsuccessful transitions to the elite level: The youth national team pathways in Norwegian handball. *International Journal of Sports Science & Coaching*, *13*(4), 533–544. https://doi.org/10.1177/1747954117740014

Bjørndal, C. T., & Gjesdal, S. (2020). The role of sport school programmes in athlete development in Norwegian handball and football. *European Journal for Sport and Society*, *17*(4), 374–396. https://doi.org/10.1080/16138171.2020.1792131

Bjørndal, C. T., Luteberget, L. S., Till, K., & Holm, S. (2018). The relative age effect in selection to international team matches in Norwegian handball. *PLOS ONE*, *13*(12), e0209288. https://doi.org/10.1371/journal.pone.0209288

Bjørndal, C. T., & Ronglan, L. T. (2018). Orchestrating talent development: Youth players' developmental experiences in Scandinavian team sports. *Sports Coaching Review*, *7*(1), 1–22. https://doi.org/10.1080/21640629.2017.1317172

Bjørndal, C. T., & Ronglan, L. T. (2019). Engaging with uncertainty in athlete development – orchestrating talent development through incremental leadership. *Sport, Education and Society*, *26*(1), 104–116. https://doi.org/10.1080/13573322.2019.1695198

Bjørndal, C. T., Ronglan, L. T., & Andersen, S. S. (2017). Talent development as an ecology of games: A case study of Norwegian handball. *Sport, Education and Society*, *22*(7), 864–877. https://doi.org/10.1080/13573322.2015.1087398

Blakelock, D. J., Chen, M. A., & Prescott, T. (2016). Psychological Distress in Elite Adolescent Soccer Players Following Deselection. *Journal of Clinical Sport Psychology*, *10*(1), 59–77. https://doi.org/10.1123/jcsp.2015-0010

Bolckmans, S., Starkes, J. L., Towlson, C., Barnes, C., Parkin, G., & Helsen, W. F. (2022). Leveling the Playing Field: A New Proposed Method to Address Relative Age- and Maturity-Related Bias in UK Male Academy Soccer Players. *Frontiers in Sports and Active Living*, *4*, 847438. https://doi.org/10.3389/fspor.2022.847438

Book, R. T., Henriksen, K., Stambulova, N., & Storm, L. K. (2022). "All they have seen is a model for failure:" Stakeholder's perspectives on athletic talent development in

American underserved communities. *Journal of Applied Sport Psychology*, *34*(6), 1037–1057. https://doi.org/10.1080/10413200.2021.1958953

Borms, J. (1986). The child and exercise: An overview. *Journal of Sports Sciences*, *4*, 3–20.

Bowles, R., & O'Dwyer, A. (2022). Identifying learning in a coaching community of practice: A collaborative self-study. *European Journal for Sport and Society*, *19*(3), 214–231. https://doi.org/10.1080/16138171.2021.1930943

Bradley, B., Johnson, D., Hill, M., McGee, D., Kana-ah, A., Sharpin, C., Sharp, P., Kelly, A., Cumming, S. P., & Malina, R. M. (2019). Bio-banding in academy football: Player's perceptions of a maturity matched tournament. *Annals of Human Biology*, *46*(5), 400–408. https://doi.org/10.1080/03014460.2019.1640284

Braun, V., & Clarke, V. (2019). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597. https://doi.org/10.1080/2159676X.2019.1628806

Braun, V., & Clarke, V. (2021). One size fits all? What counts as quality practice in (reflexive) thematic analysis? *Qualitative Research in Psychology*, *18*(3), 328–352. https://doi.org/10.1080/14780887.2020.1769238

Braun, V., & Clarke, V. (2022). Conceptual and design thinking for thematic analysis. *Qualitative Psychology*, *9*(1), 3–26. https://doi.org/10.1037/qup0000196

Breznik, K., & Law, K. M. Y. (2016). Relative Age Effect in Mind Games: The Evidence from Elite Chess. *Perceptual and Motor Skills*, *122*(2), 583–594. https://doi.org/10.1177/0031512516640957

Bridge, M. W., & Toms, M. R. (2013). The specialising or sampling debate: A retrospective analysis of adolescent sports participation in the UK. *Journal of Sports Sciences*, *31*(1), 87–96. https://doi.org/10.1080/02640414.2012.721560

Brown, G., & Potrac, P. (2009). 'You've not made the grade, son': De-selection and identity disruption in elite level youth football. *Soccer & Society*, *10*(2), 143–159. https://doi.org/10.1080/14660970802601613

Brown, K. A., Patel, D. R., & Darmawan, D. (2017). Participation in sports in relation to adolescent growth and development. *Translational Pediatrics*, *6*(3), 150–159. https://doi.org/10.21037/tp.2017.04.03

Brustio, P. R., Lupo, C., Ungureanu, A. N., Frati, R., Rainoldi, A., & Boccia, G. (2018). The relative age effect is larger in Italian soccer top-level youth categories and smaller in Serie A. *PLOS ONE*, *13*(4), e0196253. https://doi.org/10.1371/journal.pone.0196253

Bryant, A. (2009). *Grounded Theory and Pragmatism: The Curious Case of Anselm Strauss*.

Buchheit, M., & Mendez-Villanueva, A. (2014). Effects of age, maturity and body dimensions on match running performance in highly trained under-15 soccer players. *Journal of Sports Sciences*, *32*(13), 1271–1278. https://doi.org/10.1080/02640414.2014.884721

Burchett, H. E. D., Mayhew, S. H., Lavis, J. N., & Dobrow, M. J. (2013). When can research from one setting be useful in another? Understanding perceptions of the applicability and transferability of research. *Health Promotion International*, *28*(3), 418–430. https://doi.org/10.1093/heapro/das026

Byrne, D. (2022). A worked example of Braun and Clarke's approach to reflexive thematic analysis. *Quality & Quantity*, *56*(3), 1391–1412. https://doi.org/10.1007/s11135-021-01182-y

Calvin, M. (2017). *No hunger in paradise: The players : the journey : the dream*. Century.

Carling, C., Le Gall, F., & Malina, R. M. (2012). Body size, skeletal maturity, and functional characteristics of elite academy soccer players on entry between 1992 and 2003. *Journal of Sports Sciences*, *30*(15), 1683–1693. https://doi.org/10.1080/02640414.2011.637950

Cherryholmes, C. H. (1992). Notes on Pragmatism and Scientific Realism. *Educational Researcher*, *21*(6), 13–17. https://doi.org/10.3102/0013189X021006013

Childers, J., & Hentzi, G. (1995). *The Columbia dictionary of modern literary and cultural criticism*. Columbia university press.

Christensen, M. K. (2009). "An Eye for Talent": Talent Identification and the "Practical Sense" of Top-Level Soccer Coaches. *Sociology of Sport Journal*, *26*(3), 365–382. https://doi.org/10.1123/ssj.26.3.365

Clarke, N. J., & Harwood, C. G. (2014). Parenting experiences in elite youth football: A phenomenological study. *Psychology of Sport and Exercise*, *15*(5), 528–537. https://doi.org/10.1016/j.psychsport.2014.05.004

Cobley, S., Abbott, S., Eisenhuth, J., Salter, J., McGregor, D., & Romann, M. (2019). Removing relative age effects from youth swimming: The development and testing of corrective adjustment procedures. *Journal of Science and Medicine in Sport*, *22*(6), 735–740. https://doi.org/10.1016/j.jsams.2018.12.013

Cobley, S., Baker, J., Wattie, N., & McKenna, J. (2009). Annual Age-Grouping and Athlete Development: A Meta-Analytical Review of Relative Age Effects in Sport. *Sports Medicine*, *39*(3), 235–256. https://doi.org/10.2165/00007256-200939030-00005

Cobley, S., McKenna, J., Baker, J., & Wattie, N. (2009). How pervasive are relative age effects in secondary school education? *Journal of Educational Psychology*, *101*(2), 520–528. https://doi.org/10.1037/a0013845

Cobley, S., Schorer, J., & Baker, J. (2012). Identification and development of sport talent: A brief introduction to a growing field of research and practice. *In J. Baker, S. Cobley, & J. Schorer (Eds.). Talent identification and development in sport: International perspectives* (pp. 1–10). Routledge.

Coelho e Silva, M. J., Figueiredo, A. J., Simões, F., Seabra, A., Natal, A., Vaeyens, R., Philippaerts, R., Cumming, S. P., & Malina, R. M. (2010). Discrimination of U-14 Soccer Players by Level and Position. *International Journal of Sports Medicine*, *31*(11), 790–796. https://doi.org/10.1055/s-0030-1263139

Collins, D., Burke, V., Martindale, A., & Cruickshank, A. (2015). The Illusion of Competency Versus the Desirability of Expertise: Seeking a Common Standard for Support Professions in Sport. *Sports Medicine*, *45*(1), 1–7. https://doi.org/10.1007/s40279-014-0251-1

Collins, D. J., & Macnamara, A. (2017). Making Champs and Super-Champs—Current Views, Contradictions, and Future Directions. *Frontiers in Psychology*, *8*, 823. https://doi.org/10.3389/fpsyg.2017.00823

Collins, D. J., Macnamara, A., & McCarthy, N. (2016). Putting the Bumps in the Rocky Road: Optimizing the Pathway to Excellence. *Frontiers in Psychology*, *7*. https://doi.org/10.3389/fpsyg.2016.01482

Collins, D., & MacNamara, Á. (2012). The Rocky Road to the Top: Why Talent Needs Trauma. *Sports Medicine*, *42*(11), 907–914. https://doi.org/10.1007/BF03262302

Collins, D., & MacNamara, Á. (2019). From talent identification to talent development: An overview and critique. In APA Handbooks in Psychology Series. , Vol. 1. Sport Psychology, edsM. H. Anshel, T. A. Petrie, and J. A. Steinfeldt (Washington, DC: American Psychological Association), 111–128. In *APA Handbook of Sport and Exercise Psychology* (Vol. 1).

Collins, D., & MacNamara, A. (Eds.). (2022). *Talent development: A practitioner and parents guide* (Second edition). Routledge, Taylor & Francis Group.

Collins, D., MacNamara, Á., & Cruickshank, A. (2019). Research and Practice in Talent Identification and Development—Some Thoughts on the State of Play. *Journal of*

*Applied Sport Psychology*, *31*(3), 340–351. https://doi.org/10.1080/10413200.2018.1475430

Collins, D., MacNamara, Á., & McCarthy, N. (2016). Super Champions, Champions, and Almosts: Important Differences and Commonalities on the Rocky Road. *Frontiers in Psychology*, *6*. https://doi.org/10.3389/fpsyg.2015.02009

Côté, J. (1999). The Influence of the Family in the Development of Talent in Sport. *The Sport Psychologist*, *13*(4), 395–417. https://doi.org/10.1123/tsp.13.4.395

Côté, J., Baker, J., & Abernethy, B. (2007). Practice and Play in the Development of Sport Expertise. In G. Tenenbaum & R. C. Eklund (Eds.), *Handbook of Sport Psychology* (1st ed., pp. 184–202). Wiley. https://doi.org/10.1002/9781118270011.ch8

Côté, J., Ericsson, K. A., & Law, M. P. (2005). Tracing the Development of Athletes Using Retrospective Interview Methods: A Proposed Interview and Validation Procedure for Reported Information. *Journal of Applied Sport Psychology*, *17*(1), 1–19. https://doi.org/10.1080/10413200590907531

Côté, J., & Fraser-Thomas, J. (2007). Youth involvement in sport. In *Introduction to sport psychology: A Canadian perspective* (pp. 270–298). Pearson.

Côté, J., & Hay, J. (2002). Children's involvement in sport: A developmental perspective. In *Psychological Foundations of Sport* (pp. 484–502). Allyn and Bacon.

Côté, J., Lidor, R., & Hackfort, D. (2009). ISSP position stand: To sample or to specialize? Seven postulates about youth sport activities that lead to continued participation and elite performance. *International Journal of Sport and Exercise Psychology*, *7*(1), 7–17. https://doi.org/10.1080/1612197X.2009.9671889

Côté, J., & Vierimaa, M. (2014). The developmental model of sport participation: 15 years after its first conceptualization. *Science & Sports*, *29*, S63–S69. https://doi.org/10.1016/j.scispo.2014.08.133

Coutinho, P., Mesquita, I., & Fonseca, A. M. (2016). Talent development in sport: A critical review of pathways to expert performance. *International Journal of Sports Science & Coaching*, *11*(2), 279–293. https://doi.org/10.1177/1747954116637499

Creswell, J. W. (1994). *Research design: Qualitative & quantitative approaches*. Sage Publications.

*Crystal Palace Football Club*. (2022). https://www.cpfc.co.uk/news/club/crystal-palace-enhances-after-care-programme-for-released-academy-players/

Cumming, S. P., Brown, D. J., Mitchell, S., Bunce, J., Hunt, D., Hedges, C., Crane, G., Gross, A., Scott, S., Franklin, E., Breakspear, D., Dennison, L., White, P., Cain, A., Eisenmann, J. C., & Malina, R. M. (2018). Premier League academy soccer players' experiences of competing in a tournament bio-banded for biological maturation. *Journal of Sports Sciences*, *36*(7), 757–765. https://doi.org/10.1080/02640414.2017.1340656

Cumming, S. P., Lloyd, R. S., Oliver, J. L., Eisenmann, J. C., & Malina, R. M. (2017). Bio-banding in Sport: Applications to Competition, Talent Identification, and Strength and Conditioning of Youth Athletes. *Strength & Conditioning Journal*, *39*(2), 34–47. https://doi.org/10.1519/SSC.0000000000000281

Cumming, S. P., Searle, C., Hemsley, J. K., Haswell, F., Edwards, H., Scott, S., Gross, A., Ryan, D., Lewis, J., White, P., Cain, A., Mitchell, S. B., & Malina, R. M. (2018). Biological maturation, relative age and self-regulation in male professional academy soccer players: A test of the underdog hypothesis. *Psychology of Sport and Exercise*, *39*, 147–153. https://doi.org/10.1016/j.psychsport.2018.08.007

Curran, O. (2023). *Exploring a National Female Team Sport Talent Development Environment*. Doctoral Thesis (PhD), Dublin City University.

Curran, O., MacNamara, A., & Passmore, D. (2019). What About the Girls? Exploring the Gender Data Gap in Talent Development. *Frontiers in Sports and Active Living*, *1*, 3. https://doi.org/10.3389/fspor.2019.00003

Curran, O., MacNamara, Á., & Passmore, D. (2021). Singing off the same hymn sheet? Examining coherence in a talent development pathway (part 1). *Journal of Sports Sciences*, *39*(15), 1709–1716. https://doi.org/10.1080/02640414.2021.1896456

Curran, O., Passmore, D., & MacNamara, Á. (2022). Singing off the same hymn sheet? Examining coherence in a talent development pathway (part 2). *Journal of Sports Sciences*, *40*(8), 863–870. https://doi.org/10.1080/02640414.2021.2021702

Cushion, C., Ford, P. R., & Williams, A. M. (2012). Coach behaviours and practice structures in youth soccer: Implications for talent development. *Journal of Sports Sciences*, *30*(15), 1631–1641. https://doi.org/10.1080/02640414.2012.721930

Davids, K., & Baker, J. (2007). Genes, Environment and Sport Performance: Why the Nature-Nurture Dualism is no Longer Relevant. *Sports Medicine*, *37*(11), 961–980. https://doi.org/10.2165/00007256-200737110-00004

Davids, K., Güllich, A., Shuttleworth, R., & Araújo, D. (2017). Understanding Environmental and Task Constraints on Talent Development. In J. Baker, S. Cobley, J. Schorer, & N. Wattie (Eds.), *Routledge Handbook of Talent Identification and Development in Sport* (1st ed., pp. 192–206). Routledge. https://doi.org/10.4324/9781315668017-14

de la Rubia, A., Lorenzo, A., Bjørndal, C. T., Kelly, A. L., García-Aliaga, A., & Lorenzo-Calvo, J. (2021). The Relative Age Effect on Competition Performance of Spanish International Handball Players: A Longitudinal Study. *Frontiers in Psychology*, *12*, 673434. https://doi.org/10.3389/fpsyg.2021.673434

Dellal, A., Wong, D., Moalla, W., & Chamari, K. (2010). Physical and technical activity of soccer players in the French First League: With special reference to their playing position. *International Sports Medicine Journal*, *11*(2), 278–290.

Deprez, D., Fransen, J., Boone, J., Lenoir, M., Philippaerts, R., & Vaeyens, R. (2015). Characteristics of high-level youth soccer players: Variation by playing position. *Journal of Sports Sciences*, *33*(3), 243–254. https://doi.org/10.1080/02640414.2014.934707

Dewey, J. (1931). *The development of pragmatism. In H.S. Thayer (Ed.), Pragmatism: The classic writings (pp. 23-40). Indianapolis, IN: Hackett.*

Dewey, J. (1938). *Logic: The Theory of Inquiry, 1938*.

Dewey, J. (1969). *The collected works of John Dewey: 1882-1953 edited by Jo Ann Boydston*. Southern Illinois University Press.

DiFiori, J. P., Benjamin, H. J., Brenner, J. S., Gregory, A., Jayanthi, N., Landry, G. L., & Luke, A. (2014). Overuse injuries and burnout in youth sports: A position statement from the American Medical Society for Sports Medicine. *British Journal of Sports Medicine*, *48*(4), 287–288. https://doi.org/10.1136/bjsports-2013-093299

Dohme, L.-C., Backhouse, S., Piggott, D., & Morgan, G. (2017). Categorising and defining popular psychological terms used within the youth athlete talent development literature: A systematic review. *International Review of Sport and Exercise Psychology*, *10*(1), 134–163. https://doi.org/10.1080/1750984X.2016.1185451

Edmondson, A. (1999). Psychological Safety and Learning Behavior in Work Teams. *Administrative Science Quarterly*, *44*(2), 350–383. https://doi.org/10.2307/2666999

Edmondson, A. C. (2019). *The fearless organization: Creating psychological safety in the workplace for learning, innovation, and growth*. John Wiley & Sons, Inc.

*Elite Player Performance Plan: A Document Prepared by the English Premier League*. (2011).

Epstein, D. J. (2014). *The sports gene: Talent, practice and the truth about success*. Yellow Jersey Press.

Epstein, L. H., Valoski, A. M., Kalarchian, M. A., & McCurley, J. (1995). Do Children Lose and Maintain Weight Easier Than Adults: A Comparison of Child and Parent Weight Changes From Six Months to Ten Years. *Obesity Research*, *3*(5), 411–417. https://doi.org/10.1002/j.1550-8528.1995.tb00170.x

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, *100*(3), 363–406. https://doi.org/10.1037/0033-295X.100.3.363

Erikstad, M. K., Tore Johansen, B., Johnsen, M., Haugen, T., & Côté, J. (2021). "As Many as Possible for as Long as Possible"—A Case Study of a Soccer Team That Fosters Multiple Outcomes. *The Sport Psychologist*, *35*(2), 131–141. https://doi.org/10.1123/tsp.2020-0107

Fabricant, P. D., Lakomkin, N., Sugimoto, D., Tepolt, F. A., Stracciolini, A., & Kocher, M. S. (2016). Youth sports specialization and musculoskeletal injury: A systematic review of the literature. *The Physician and Sportsmedicine*, *44*(3), 257–262. https://doi.org/10.1080/00913847.2016.1177476

Faude, O., Koch, T., & Meyer, T. (2012). Straight sprinting is the most frequent action in goal situations in professional football. *Journal of Sports Sciences*, *30*(7), 625–631. https://doi.org/10.1080/02640414.2012.665940

FIFA. (2021). *FIFA: Ten Years of International Transfers: A Report on International Football Transfers Worldwide 2011–2020.* FIFA. https:// sports.tj/wp-content/uploads/2021/09/fifa-ten-years-international-transfersreport. pdf

*FIFA: Republic of Ireland.* (2021). https://www.fifa.com/ fifa-world-ranking/IRL

Figueiredo, A. J., Coelho-e-Silva, M. J., Cumming, S. P., & Malina, R. M. (2019). Relative age effect: Characteristics of youth soccer players by birth quarter and subsequent playing status. *Journal of Sports Sciences*, *37*(6), 677–684. https://doi.org/10.1080/02640414.2018.1522703

Flatgård, G., Larsen, C. H., & Sæther, S. A. (2020). Talent development environment in a professional football club in Norway. *Scandinavian Journal of Sport and Exercise Psychology*, *2*, 8–15. https://doi.org/10.7146/sjsep.v2i0.114470

*Football Association of Ireland Board and Assembly*. (2023). https://www.fai.ie/domestic/fai/fai-board-and-assembly

*Football Association of Ireland ETP*. (2022). https://www.fai.ie/domestic/take-part-programmes/emerging-talent

*Football Association of Ireland NL*. (2023). https://www.fai.ie/domestic/news/2023-underage-national-league-formats-confirmed#:~:text=The%20Football%20Association%20of%20Ireland,other%20underage%20National%20League%20competitions.

*Football Association of Ireland Strategy (2022-2025)*. (2022). https://www.fai.ie/sites/default/files/atoms/files/FAI%20Strategy%202022-2025.pdf

Ford, P. R., Carling, C., Garces, M., Marques, M., Miguel, C., Farrant, A., Stenling, A., Moreno, J., Le Gall, F., Holmström, S., Salmela, J. H., & Williams, M. (2012). The developmental activities of elite soccer players aged under-16 years from Brazil, England, France, Ghana, Mexico, Portugal and Sweden. *Journal of Sports Sciences*, *30*(15), 1653–1663. https://doi.org/10.1080/02640414.2012.701762

Ford, P. R., Ward, P., Hodges, N. J., & Williams, A. M. (2009). The role of deliberate practice and play in career progression in sport: The early engagement hypothesis. *High Ability Studies*, *20*(1), 65–75. https://doi.org/10.1080/13598130902860721

Ford, P. R., & Williams, A. M. (2012). The developmental activities engaged in by elite youth soccer players who progressed to professional status compared to those who did not. *Psychology of Sport and Exercise*, *13*(3), 349–352. https://doi.org/10.1016/j.psychsport.2011.09.004

Fraser-Thomas, J., Côté, J., & Deakin, J. (2008). Examining Adolescent Sport Dropout and Prolonged Engagement from a Developmental Perspective. *Journal of Applied Sport Psychology*, *20*(3), 318–333. https://doi.org/10.1080/10413200802163549

Frome, D., Rychlik, K., Fokas, J., Chiampas, G., Jayanthi, N., & LaBella, C. (2019). Sports Specialization Is Not Associated With Greater Odds of Previous Injury in Elite Male Youth Soccer Players. *Clinical Journal of Sport Medicine*, *29*(5), 368–373. https://doi.org/10.1097/JSM.0000000000000643

Gagné, F. (2000). Understanding the Complex Choreography of Talent Development Through DMGT-Based Analysis. In *International Handbook of Giftedness and Talent* (pp. 67–79). Elsevier. https://doi.org/10.1016/B978-008043796-5/50005-X

Gagné, F. (2004). Transforming gifts into talents: The DMGT as a developmental theory1. *High Ability Studies*, *15*(2), 119–147. https://doi.org/10.1080/1359813042000314682

Gershgoren, L., Filho, E. M., Tenenbaum, G., & Schinke, R. J. (2013). Coaching Shared Mental Models in Soccer: A Longitudinal Case Study. Journal of Clinical Sport Psychology, 7(4), 293–312. https://doi.org/10.1123/jcsp.7.4.293

Giacobbi, P. R., Poczwardowski, A., & Hager, P. (2005). A Pragmatic Research Philosophy for Sport and Exercise Psychology. *The Sport Psychologist*, *19*(1), 18–31. https://doi.org/10.1123/tsp.19.1.18

Gibbs, B. G., Jarvis, J. A., & Dufur, M. J. (2012). The rise of the underdog? The relative age effect reversal among Canadian-born NHL hockey players: A reply to Nolan and

Howell. *International Review for the Sociology of Sport*, *47*(5), 644–649. https://doi.org/10.1177/1012690211414343

Gladwell, M. (2009). *Outliers: The story of success*. Penguin Books.

Goldman, D. E., Turnnidge, J., Kelly, A. L., deVos, J., & Côté, J. (2022). Athlete perceptions of playing-up in youth soccer. *Journal of Applied Sport Psychology*, *34*(4), 862–885. https://doi.org/10.1080/10413200.2021.1875518

González-Víllora, S., Pastor-Vicedo, J. C., & Cordente, D. (2015). Relative Age Effect in UEFA Championship Soccer Players. *Journal of Human Kinetics*, *47*(1), 237–248. https://doi.org/10.1515/hukin-2015-0079

Gould, D., Dieffenbach, K., & Moffett, A. (2002). Psychological Characteristics and Their Development in Olympic Champions. *Journal of Applied Sport Psychology*, *14*(3), 172–204. https://doi.org/10.1080/10413200290103482

Gould, D., Lauer, L., Rolo, C., Jannes, C., & Pennisi, N. (2006). Understanding the role parents play in tennis success: A national survey of junior tennis coaches. *British Journal of Sports Medicine*, *40*(7), 632–636. https://doi.org/10.1136/bjsm.2005.024927

Gray, L. M., Wong-Wylie, G., Rempel, G. R., & Cook, K. (2020). *Expanding Qualitative Research Interviewing Strategies: Zoom Video Communications*.

Gulbin, J., Oldenziel, K., Weissensteiner, J., & Gagné, F. (2010). A Look through the Rear View Mirror: Developmental Experiences and Insights of High Performance Athletes. *Talent Development and Excellence*, *2*, 149–164.

Gulbin, J., Weissensteiner, J., Oldenziel, K., & Gagné, F. (2013). Patterns of performance development in elite athletes. *European Journal of Sport Science*, *13*(6), 605–614. https://doi.org/10.1080/17461391.2012.756542

Güllich, A. (2014). Selection, de-selection and progression in German football talent promotion. *European Journal of Sport Science*, *14*(6), 530–537. https://doi.org/10.1080/17461391.2013.858371

Güllich, A. (2019). "Macro-structure" of developmental participation histories and "micro-structure" of practice of German female world-class and national-class football players. *Journal of Sports Sciences*, *37*(12), 1347–1355. https://doi.org/10.1080/02640414.2018.1558744

Güllich, A., Barth, M., Macnamara, B. N., & Hambrick, D. Z. (2023). Quantifying the Extent to Which Successful Juniors and Successful Seniors are Two Disparate Populations: A Systematic Review and Synthesis of Findings. *Sports Medicine*. https://doi.org/10.1007/s40279-023-01840-1

Güllich, A., & Emrich, E. (2006). Evaluation of the support of young athletes in the elite sports system. *European Journal for Sport and Society*, *3*(2), 85–108. https://doi.org/10.1080/16138171.2006.11687783

Güllich, A., Kovar, P., Zart, S., & Reimann, A. (2017). Sport activities differentiating match-play improvement in elite youth footballers – a 2-year longitudinal study. *Journal of Sports Sciences*, *35*(3), 207–215. https://doi.org/10.1080/02640414.2016.1161206

Gundersen, H., Riiser, A., Algroy, E., Vestbøstad, M., Saeterbakken, A. H., Clemm, H. H., Grendstad, H., Hafstad, A., Kristoffersen, M., & Rygh, C. B. (2022). Associations between biological maturity level, match locomotion, and physical capacities in youth male soccer players. *Scandinavian Journal of Medicine & Science in Sports*, *32*(11), 1592–1601. https://doi.org/10.1111/sms.14225

Hancock, D. J., Adler, A. L., & Côté, J. (2013). A proposed theoretical model to explain relative age effects in sport. *European Journal of Sport Science*, *13*(6), 630–637. https://doi.org/10.1080/17461391.2013.775352

Hannon, M. P., Close, G. L., & Morton, J. P. (2020). Energy and Macronutrient Considerations for Young Athletes. *Strength & Conditioning Journal*, *42*(6), 109–119. https://doi.org/10.1519/SSC.0000000000000570

Harwood, C., Drew, A., & Knight, C. J. (2010). Parental stressors in professional youth football academies: A qualitative investigation of specialising stage parents. *Qualitative Research in Sport and Exercise*, *2*(1), 39–55. https://doi.org/10.1080/19398440903510152

Haugaasen, M., & Jordet, G. (2012). Developing football expertise: A football-specific research review. *International Review of Sport and Exercise Psychology*, *5*(2), 177–201. https://doi.org/10.1080/1750984X.2012.677951

Haugaasen, M., Toering, T., & Jordet, G. (2014). From childhood to senior professional football: A multi-level approach to elite youth football players' engagement in football-specific activities. *Psychology of Sport and Exercise*, *15*(4), 336–344. https://doi.org/10.1016/j.psychsport.2014.02.007

Helsen, W. F., Baker, J., Michiels, S., Schorer, J., Van winckel, J., & Williams, A. M. (2012). The relative age effect in European professional soccer: Did ten years of research make any difference? *Journal of Sports Sciences*, *30*(15), 1665–1671. https://doi.org/10.1080/02640414.2012.721929

Helsen, W. F., Starkes, J. L., & Van Winckel, J. (1998). The influence of relative age on success and dropout in male soccer players. *American Journal of Human Biology*, *10*(6), 791–798. https://doi.org/10.1002/(SICI)1520-6300(1998)10:6<791::AID-AJHB10>3.0.CO;2-1

Helsen, W. F., Starkes, J. L., & Van Winckel, J. (2000). Effect of a change in selection year on success in male soccer players. *American Journal of Human Biology*, *12*(6), 729–735. https://doi.org/10.1002/1520-6300(200011/12)12:6<729::AID-AJHB2>3.0.CO;2-7

Helsen, W. F., van Winckel, J., & Williams, A. M. (2005). The relative age effect in youth soccer across Europe. *Journal of Sports Sciences*, *23*(6), 629–636. https://doi.org/10.1080/02640410400021310

Hem, M., Fuhre, J., Høigaard, R., & Sæther, S. A. (2022). Talent development abroad. Young football players' experiences and challenges on being recruited to English academies. *Soccer & Society*, *23*(8), 1118–1129. https://doi.org/10.1080/14660970.2022.2038573

Hendry, D. T., & Hodges, N. J. (2018). Early majority engagement pathway best defines transitions from youth to adult elite men's soccer in the UK: A three time-point retrospective and prospective study. *Psychology of Sport and Exercise*, *36*, 81–89. https://doi.org/10.1016/j.psychsport.2018.01.009

Henriksen, K., & Stambulova, N. (2017). Creating Optimal Environments for Talent Development. In J. Baker, S. Cobley, J. Schorer, & N. Wattie (Eds.), *Routledge Handbook of Talent Identification and Development in Sport* (1st ed., pp. 270–284). Routledge. https://doi.org/10.4324/9781315668017-19

Henriksen, K., Stambulova, N., & Roessler, K. K. (2010a). Holistic approach to athletic talent development environments: A successful sailing milieu. *Psychology of Sport and Exercise*, *11*(3), 212–222. https://doi.org/10.1016/j.psychsport.2009.10.005

Henriksen, K., Stambulova, N., & Roessler, K. K. (2010b). Successful talent development in track and field: Considering the role of environment: Successful track and field environment. *Scandinavian Journal of Medicine & Science in Sports*, *20*, 122–132. https://doi.org/10.1111/j.1600-0838.2010.01187.x

Herrebrøden, H., & Bjørndal, C. T. (2022). Youth International Experience Is a Limited Predictor of Senior Success in Football: The Relationship Between U17, U19, and U21 Experience and Senior Elite Participation Across Nations and Playing Positions.

*Frontiers in Sports and Active Living*, *4*, 875530. https://doi.org/10.3389/fspor.2022.875530

Hibberd, E. E., Hackney, A. C., Lane, A. R., & Myers, J. B. (2014). Assessing biological maturity: Chronological age and the pubertal development scale predict free testosterone in adolescent males. *Journal of Pediatric Endocrinology and Metabolism*, *0*(0). https://doi.org/10.1515/jpem-2014-0187

Hill, M., Scott, S., Malina, R. M., McGee, D., & Cumming, S. P. (2020). Relative age and maturation selection biases in academy football. *Journal of Sports Sciences*, *38*(11–12), 1359–1367. https://doi.org/10.1080/02640414.2019.1649524

Hill, M., Scott, S., McGee, D., & Cumming, S. P. (2021). Are relative age and biological ages associated with coaches' evaluations of match performance in male academy soccer players? *International Journal of Sports Science & Coaching*, *16*(2), 227–235. https://doi.org/10.1177/1747954120966886

Hill, M., Spencer, A., McGee, D., Scott, S., Frame, M., & Cumming, S. P. (2020). The psychology of bio-banding: A Vygotskian perspective. *Annals of Human Biology*, *47*(4), 328–335. https://doi.org/10.1080/03014460.2020.1797163

Holt, N. L. (2002). A Comparison of the Soccer Talent Development Systems in England and Canada. *European Physical Education Review*, *8*(3), 270–285. https://doi.org/10.1177/1356336X020083006

Houser, N., & Kloesel, C. J. W. (1992). *The essential Peirce: Selected philosophical writings (1867–1893)*. Indiana University Press.

Howe, M. J. A., Davidson, J. W., & Sloboda, J. A. (1998). Innate talents: Reality or myth? *Behavioral and Brain Sciences*, *21*(3), 399–407. https://doi.org/10.1017/S0140525X9800123X

Hurley, W., Lior, D., & Tracze, S. (2001). A Proposal to Reduce the Age Discrimination in Canadian Minor Hockey. *Canadian Public Policy / Analyse de Politiques*, *27*(1), 65. https://doi.org/10.2307/3552374

Issurin, V. B. (2017). Evidence-Based Prerequisites and Precursors of Athletic Talent: A Review. *Sports Medicine*, *47*(10), 1993–2010. https://doi.org/10.1007/s40279-017-0740-0

Ivarsson, A., Stenling, A., Fallby, J., Johnson, U., Borg, E., & Johansson, G. (2015). The predictive ability of the talent development environment on youth elite football players' well-being: A person-centered approach. *Psychology of Sport and Exercise*, *16*, 15–23. https://doi.org/10.1016/j.psychsport.2014.09.006

James, W. (1907). *Pragmatism: A new name for some old ways of thinking.* Longmans, Green and Co. https://doi.org/10.1037/10851-000

Jayanthi, N. A., LaBella, C. R., Fischer, D., Pasulka, J., & Dugas, L. R. (2015). Sports-Specialized Intensive Training and the Risk of Injury in Young Athletes: A Clinical Case-Control Study. *The American Journal of Sports Medicine*, *43*(4), 794–801. https://doi.org/10.1177/0363546514567298

Jayanthi, N., Kliethermes, S. A., & Côté, J. (2020). Youth sport specialisation: The need for an evidence-based definition. *British Journal of Sports Medicine*, *54*(4), 196–197. https://doi.org/10.1136/bjsports-2019-101256

Jayanthi, N., Pinkham, C., Dugas, L., Patrick, B., & LaBella, C. (2013). Sports Specialization in Young Athletes: Evidence-Based Recommendations. *Sports Health: A Multidisciplinary Approach*, *5*(3), 251–257. https://doi.org/10.1177/1941738112464626

John, J. M., Gropper, H., & Thiel, A. (2019). The role of critical life events in the talent development pathways of athletes and musicians: A systematic review. *Psychology of Sport and Exercise*, *45*, 101565. https://doi.org/10.1016/j.psychsport.2019.101565

Johnson, A. (2015). Monitoring the Immature Athlete. *Aspetar Sports Medicine Journal*, *4*(114).

Johnson, A., Farooq, A., & Whiteley, R. (2017). Skeletal maturation status is more strongly associated with academy selection than birth quarter. *Science and Medicine in Football*, *1*(2), 157–163. https://doi.org/10.1080/24733938.2017.1283434

Johnson, D. M., Williams, S., Bradley, B., Sayer, S., Murray Fisher, J., & Cumming, S. (2020). Growing pains: Maturity associated variation in injury risk in academy football. *European Journal of Sport Science*, *20*(4), 544–552. https://doi.org/10.1080/17461391.2019.1633416

Johnston, K., & Baker, J. (2020). Waste Reduction Strategies: Factors Affecting Talent Wastage and the Efficacy of Talent Selection in Sport. *Frontiers in Psychology*, *10*, 2925. https://doi.org/10.3389/fpsyg.2019.02925

Johnston, K., Wattie, N., Schorer, J., & Baker, J. (2018). Talent Identification in Sport: A Systematic Review. *Sports Medicine*, *48*(1), 97–109. https://doi.org/10.1007/s40279-017-0803-2

Jokuschies, N., Gut, V., & Conzelmann, A. (2017). Systematizing coaches' 'eye for talent': Player assessments based on expert coaches' subjective talent criteria in top-level youth soccer. *International Journal of Sports Science & Coaching*, *12*(5), 565–576. https://doi.org/10.1177/1747954117727646

Jones, S., Almousa, S., Gibb, A., Allamby, N., Mullen, R., Andersen, T. E., & Williams, M. (2019). Injury Incidence, Prevalence and Severity in High-Level Male Youth Football:

A Systematic Review. *Sports Medicine*, *49*(12), 1879–1899. https://doi.org/10.1007/s40279-019-01169-8

Jowett, S., Do Nascimento-Júnior, J. R. A., Zhao, C., & Gosai, J. (2023). Creating the conditions for psychological safety and its impact on quality coach-athlete relationships. *Psychology of Sport and Exercise*, *65*, 102363. https://doi.org/10.1016/j.psychsport.2022.102363

Kahneman, D., & Riis, J. (2005). Living, and thinking about it: Two perspectives on life. In F. A. Huppert, N. Baylis, & B. Keverne (Eds.), The Science of Well-Being (pp. 284–305). Oxford University Press. https://doi.org/10.1093/acprof:oso/9780198567523.003.0011

Kaushik, V., & Walsh, C. A. (2019). Pragmatism as a Research Paradigm and Its Implications for Social Work Research. *Social Sciences*, *8*(9), 255. https://doi.org/10.3390/socsci8090255

Kelly, A. L., Jackson, D. T., Taylor, J. J., Jeffreys, M. A., & Turnnidge, J. (2020). "Birthday-Banding" as a Strategy to Moderate the Relative Age Effect: A Case Study Into the England Squash Talent Pathway. *Frontiers in Sports and Active Living*, *2*, 573890. https://doi.org/10.3389/fspor.2020.573890

Kelly, A. L., Till, K., Jackson, D., Barrell, D., Burke, K., & Turnnidge, J. (2021). Talent Identification and Relative Age Effects in English Male Rugby Union Pathways: From Entry to Expertise. *Frontiers in Sports and Active Living*, *3*, 640607. https://doi.org/10.3389/fspor.2021.640607

Kelly, A. L., Williams, C. A., Jackson, D. T., Turnnidge, J., Reeves, M. J., Dugdale, J. H., & Wilson, M. R. (2023). Exploring the role of socioeconomic status and psychological characteristics on talent development in an English soccer academy. *Science and Medicine in Football*, 1–9. https://doi.org/10.1080/24733938.2023.2213191

Kelly, A., Wilson, M. R., Jackson, D. T., Goldman, D. E., Turnnidge, J., Côté, J., & Williams, C. A. (2021). A multidisciplinary investigation into "playing-up" in academy football according to age phase. *Journal of Sports Sciences*, *39*(8), 854–864. https://doi.org/10.1080/02640414.2020.1848117

Khamis, H., & Roche, A. (1994). Predicting adult stature without using skeletal age: The Khamis–Roche method. *Pediatrics*, *94*, 504–507.

Khamis, H., & Roche, A. (1995). Predicting adult stature without using skeletal age: The Khamis-Roche method erratum. *Pediatrics*, *95*, 457.

Kozieł, S. M., & Malina, R. M. (2018). Modified Maturity Offset Prediction Equations: Validation in Independent Longitudinal Samples of Boys and Girls. *Sports Medicine*, *48*(1), 221–236. https://doi.org/10.1007/s40279-017-0750-y

LaPrade, R. F., Agel, J., Baker, J., Brenner, J. S., Cordasco, F. A., Côté, J., Engebretsen, L., Feeley, B. T., Gould, D., Hainline, B., Hewett, T. E., Jayanthi, N., Kocher, M. S., Myer, G. D., Nissen, C. W., Philippon, M. J., & Provencher, M. T. (2016). AOSSM Early Sport Specialization Consensus Statement. *Orthopaedic Journal of Sports Medicine*, *4*(4), 232596711664424. https://doi.org/10.1177/2325967116644241

Larkin, P., & O'Connor, D. (2017). Talent identification and recruitment in youth soccer: Recruiter's perceptions of the key attributes for player recruitment. *PLOS ONE*, *12*(4), e0175716. https://doi.org/10.1371/journal.pone.0175716

Larsen, C. H., Alfermann, D., Henriksen, K., & Christensen, M. K. (2013). Successful talent development in soccer: The characteristics of the environment. *Sport, Exercise, and Performance Psychology*, *2*(3), 190–206. https://doi.org/10.1037/a0031958

Larsen, C. H., Alfermann, D., Henriksen, K., & Christensen, M. K. (2014). Preparing Footballers for the Next Step: An Intervention Program From an Ecological

Perspective. *The Sport Psychologist*, *28*(1), 91–102. https://doi.org/10.1123/tsp.2013-0015

Larsen, C. H., Storm, L. K., Sæther, S. A., Pyrdol, N., & Henriksen, K. (2020). A world class academy in professional football: The case of Ajax Amsterdam. *Scandinavian Journal of Sport and Exercise Psychology*, *2*, 33–43. https://doi.org/10.7146/sjsep.v2i0.119746

Law, M. P., Côté, J., & Ericsson, K. A. (2007). Characteristics of expert development in rhythmic gymnastics: A retrospective study. *International Journal of Sport and Exercise Psychology*, *5*(1), 82–103. https://doi.org/10.1080/1612197X.2008.9671814

le Gall, F., Carling, C., Williams, M., & Reilly, T. (2010). Anthropometric and fitness characteristics of international, professional and amateur male graduate soccer players from an elite youth academy. *Journal of Science and Medicine in Sport*, *13*(1), 90–95. https://doi.org/10.1016/j.jsams.2008.07.004

Lewis, J., Morgan, K., & Cooper, S.-M. (2015). Relative Age Effects in Welsh Age Grade Rugby Union. *International Journal of Sports Science & Coaching*, *10*(5), 797–813. https://doi.org/10.1260/1747-9541.10.5.797

Li, C., Wang, C. K. J., & Pyun, D. Y. (2014). Talent Development Environmental Factors in Sport: A Review and Taxonomic Classification. *Quest*, *66*(4), 433–447. https://doi.org/10.1080/00336297.2014.944715

Lincoln, Y. S., & Guba, E. G. (2000). Paradigmatic controversies, contradictions, and emerging confluences. In *Handbook of qualitative research* (2nd ed., pp. 163–188). Sage Publications.

Lorimer, R., & Jowett, S. (2010). Feedback of information in the empathic accuracy of sport coaches. *Psychology of Sport and Exercise*, *11*(1), 12–17. https://doi.org/10.1016/j.psychsport.2009.03.006

Lovell, R., Towlson, C., Parkin, G., Portas, M., Vaeyens, R., & Cobley, S. (2015). Soccer Player Characteristics in English Lower-League Development Programmes: The Relationships between Relative Age, Maturation, Anthropometry and Physical Fitness. *PLOS ONE*, *10*(9), e0137238. https://doi.org/10.1371/journal.pone.0137238

Lüdin, D., Donath, L., Cobley, S., Mann, D., & Romann, M. (2022a). Player-labelling as a solution to overcome maturation selection biases in youth football. *Journal of Sports Sciences*, *40*(14), 1641–1647. https://doi.org/10.1080/02640414.2022.2099077

Lüdin, D., Donath, L., Cobley, S., & Romann, M. (2022b). Effect of bio-banding on physiological and technical-tactical key performance indicators in youth elite soccer. *European Journal of Sport Science*, *22*(11), 1659–1667. https://doi.org/10.1080/17461391.2021.1974100

Lund, S., & Söderström, T. (2017). To See or Not to See: Talent Identification in the Swedish Football Association. *Sociology of Sport Journal*, *34*(3), 248–258. https://doi.org/10.1123/ssj.2016-0144

MacNamara, Á. (2022). Talent Development. In *Sport Psychology Essentials*. Human Kinetics.

MacNamara, Á., Button, A., & Collins, D. (2010a). The Role of Psychological Characteristics in Facilitating the Pathway to Elite Performance Part 1: Identifying Mental Skills and Behaviors. *The Sport Psychologist*, *24*(1), 52–73. https://doi.org/10.1123/tsp.24.1.52

MacNamara, Á., Button, A., & Collins, D. (2010b). The Role of Psychological Characteristics in Facilitating the Pathway to Elite Performance Part 2: Examining Environmental and Stage-Related Differences in Skills and Behaviors. *The Sport Psychologist*, *24*(1), 74–96. https://doi.org/10.1123/tsp.24.1.74

Malina, R. M., Coelho E Silva, M. J., Figueiredo, A. J., Carling, C., & Beunen, G. P. (2012). Interrelationships among invasive and non-invasive indicators of biological maturation

in adolescent male soccer players. *Journal of Sports Sciences*, *30*(15), 1705–1717. https://doi.org/10.1080/02640414.2011.639382

Malina, R. M., Cumming, S. P., Rogol, A. D., Coelho-e-Silva, M. J., Figueiredo, A. J., Konarski, J. M., & Kozieł, S. M. (2019). Bio-Banding in Youth Sports: Background, Concept, and Application. *Sports Medicine*, *49*(11), 1671–1685. https://doi.org/10.1007/s40279-019-01166-x

Malina, R. M., Dompier, T. P., Powell, J. W., Barron, M. J., & Moore, M. T. (2007). Validation of a Noninvasive Maturity Estimate Relative to Skeletal Age in Youth Football Players. *Clinical Journal of Sport Medicine*, *17*(5), 362–368. https://doi.org/10.1097/JSM.0b013e31815400f4

Malina, R. M., Eisenmann, J. C., Cumming, S. P., Ribeiro, B., & Aroso, J. (2004). Maturity-associated variation in the growth and functional capacities of youth football (soccer) players 13?15 years. *European Journal of Applied Physiology*, *91*(5–6), 555–562. https://doi.org/10.1007/s00421-003-0995-z

Malina, R. M., Reyes, M. E. P., Eisenmann, J. C., Horta, L., Rodrigues, J., & Miller, R. (2000). Height, mass and skeletal maturity of elite Portuguese soccer players aged 11–16 years. *Journal of Sports Sciences*, *18*(9), 685–693. https://doi.org/10.1080/02640410050120069

Malina, R. M., Rogol, A. D., Cumming, S. P., Coelho e Silva, M. J., & Figueiredo, A. J. (2015). Biological maturation of youth athletes: Assessment and implications. *British Journal of Sports Medicine*, *49*(13), 852–859. https://doi.org/10.1136/bjsports-2015-094623

Mann, D. L., & van Ginneken, P. J. M. A. (2017). Age-ordered shirt numbering reduces the selection bias associated with the relative age effect. *Journal of Sports Sciences*, *35*(8), 784–790. https://doi.org/10.1080/02640414.2016.1189588

Martindale, R. J. J., Collins, D., & Abraham, A. (2007). Effective Talent Development: The Elite Coach Perspective in UK Sport. *Journal of Applied Sport Psychology*, *19*(2), 187–206. https://doi.org/10.1080/10413200701188944

Martindale, R. J. J., Collins, D., & Daubney, J. (2005). Talent Development: A Guide for Practice and Research Within Sport. *Quest*, *57*(4), 353–375. https://doi.org/10.1080/00336297.2005.10491862

Materne, O., Chamari, K., Farooq, A., Weir, A., Hölmich, P., Bahr, R., Greig, M., & McNaughton, L. R. (2021). Injury incidence and burden in a youth elite football academy: A four-season prospective study of 551 players aged from under 9 to under 19 years. *British Journal of Sports Medicine*, *55*(9), 493–500. https://doi.org/10.1136/bjsports-2020-102859

McCarthy, N., Collins, D., & Court, D. (2016). Start hard, finish better: Further evidence for the reversal of the RAE advantage. *Journal of Sports Sciences*, *34*(15), 1461–1465. https://doi.org/10.1080/02640414.2015.1119297

McCarthy, N., Taylor, J., Cruickshank, A., & Collins, D. (2022). Happy Birthday? Relative Age Benefits and Decrements on the Rocky Road. *Sports*, *10*(6), 82. https://doi.org/10.3390/sports10060082

McGlinchey, T. R., Saward, C., Healy, L. C., & Sarkar, M. (2022). "From everything to nothing in a split second": Elite youth players' experiences of release from professional football academies. *Frontiers in Sports and Active Living*, *4*, 941482. https://doi.org/10.3389/fspor.2022.941482

Meylan, C., Cronin, J., Oliver, J., & Hughes, M. (2010). Talent Identification in Soccer: The Role of Maturity Status on Physical, Physiological and Technical Characteristics. *International Journal of Sports Science & Coaching*, *5*(4), 571–592. https://doi.org/10.1260/1747-9541.5.4.571

Mills, A., Butt, J., Maynard, I., & Harwood, C. (2012). Identifying factors perceived to influence the development of elite youth football academy players. *Journal of Sports Sciences*, *30*(15), 1593–1604. https://doi.org/10.1080/02640414.2012.710753

Mills, A., Butt, J., Maynard, I., & Harwood, C. (2014a). Toward an Understanding of Optimal Development Environments Within Elite English Soccer Academies. *The Sport Psychologist*, *28*(2), 137–150. https://doi.org/10.1123/tsp.2013-0018

Mills, A., Butt, J., Maynard, I., & Harwood, C. (2014b). Examining the Development Environments of Elite English Football Academies: The Players' Perspective. *International Journal of Sports Science & Coaching*, *9*(6), 1457–1472. https://doi.org/10.1260/1747-9541.9.6.1457

Mirwald, R. L., Baxter-Jones, A. D. G., Bailey, D. A., & Beunen, G. P. (2002). An assessment of maturity from anthropometric measurements. *Medicine & Science in Sports & Exercise*, *34*(4), 689–694.

Misak, C. J. (2016). *Cambridge pragmatism: From Peirce and James to Ramsey and Wittgenstein* (First edition). Oxford University Press.

Mitchell, L. A., Knight, C. J., Morris, R., & Mellalieu, S. D. (2021). "Maybe I'm just not good enough?": British swimmers' experiences of attempting to qualify for the Olympic Games. *Scandinavian Journal of Medicine & Science in Sports*, *31*(7), 1558–1573. https://doi.org/10.1111/sms.13953

Mitchell, T., Gledhill, A., Nesti, M., Richardson, D., & Littlewood, M. (2020). Practitioner Perspectives on the Barriers Associated With Youth-to-Senior Transition in Elite Youth Soccer Academy Players. *International Sport Coaching Journal*, *7*(3), 273–282. https://doi.org/10.1123/iscj.2019-0015

Moesch, K., Elbe, A.-M., Hauge, M.-L. T., & Wikman, J. M. (2011). Late specialization: The key to success in centimeters, grams, or seconds (cgs) sports: Talent development, CGS

sport, specialization. *Scandinavian Journal of Medicine & Science in Sports*, *21*(6), e282–e290. https://doi.org/10.1111/j.1600-0838.2010.01280.x

Moon, K., & Blackman, D. (2014). A Guide to Understanding Social Science Research for Natural Scientists: Social Science for Natural Scientists. *Conservation Biology*, *28*(5), 1167–1177. https://doi.org/10.1111/cobi.12326

Moran, J., Cervera, V., Jones, B., Hope, E., Drury, B., & Sandercock, G. (2022). Can discreet performance banding, as compared to bio-banding, discriminate technical skills in male adolescent soccer players? A preliminary investigation. *International Journal of Sports Science & Coaching*, *17*(2), 325–333. https://doi.org/10.1177/17479541211031170

Morris, R., Tod, D., & Eubank, M. (2017). From youth team to first team: An investigation into the transition experiences of young professional athletes in soccer. *International Journal of Sport and Exercise Psychology*, *15*(5), 523–539. https://doi.org/10.1080/1612197X.2016.1152992

Morris, R., Tod, D., & Oliver, E. (2015). An Analysis of Organizational Structure and Transition Outcomes in the Youth-to-Senior Professional Soccer Transition. *Journal of Applied Sport Psychology*, *27*(2), 216–234. https://doi.org/10.1080/10413200.2014.980015

Morris, R., Tod, D., & Oliver, E. (2016). An Investigation Into Stakeholders' Perceptions of the Youth-to-Senior Transition in Professional Soccer in the United Kingdom. *Journal of Applied Sport Psychology*, *28*(4), 375–391. https://doi.org/10.1080/10413200.2016.1162222

Mosher, A., Fraser-Thomas, J., & Baker, J. (2020). What Defines Early Specialization: A Systematic Review of Literature. *Frontiers in Sports and Active Living*, *2*, 596229. https://doi.org/10.3389/fspor.2020.596229

Mujika, I., Vaeyens, R., Matthys, S. P. J., Santisteban, J., Goiriena, J., & Philippaerts, R. (2009). The relative age effect in a professional football club setting. *Journal of Sports Sciences*, *27*(11), 1153–1158. https://doi.org/10.1080/02640410903220328

Musch, J., & Grondin, S. (2001). Unequal Competition as an Impediment to Personal Development: A Review of the Relative Age Effect in Sport. *Developmental Review*, *21*(2), 147–167. https://doi.org/10.1006/drev.2000.0516

Myer, G. D., Jayanthi, N., Difiori, J. P., Faigenbaum, A. D., Kiefer, A. W., Logerstedt, D., & Micheli, L. J. (2015). Sport Specialization, Part I: Does Early Sports Specialization Increase Negative Outcomes and Reduce the Opportunity for Success in Young Athletes? *Sports Health: A Multidisciplinary Approach*, *7*(5), 437–442. https://doi.org/10.1177/1941738115598747

Myer, G. D., Jayanthi, N., DiFiori, J. P., Faigenbaum, A. D., Kiefer, A. W., Logerstedt, D., & Micheli, L. J. (2016). Sports Specialization, Part II: Alternative Solutions to Early Sport Specialization in Youth Athletes. *Sports Health: A Multidisciplinary Approach*, *8*(1), 65–73. https://doi.org/10.1177/1941738115614811

Nash, C., & Taylor, J. (2021). 'Just Let Them Play': Complex Dynamics in Youth Sport, Why It Isn't So Simple. *Frontiers in Psychology*, *12*, 700750. https://doi.org/10.3389/fpsyg.2021.700750

Neely, K. C., Dunn, J. G. H., McHugh, T.-L. F., & Holt, N. L. (2018). Female Athletes' Experiences of Positive Growth Following Deselection in Sport. *Journal of Sport and Exercise Psychology*, *40*(4), 173–185. https://doi.org/10.1123/jsep.2017-0136

Newport, R. A., Knight, C. J., & Love, T. D. (2021). The youth football journey: Parents' experiences and recommendations for support. *Qualitative Research in Sport, Exercise and Health*, *13*(6), 1006–1026. https://doi.org/10.1080/2159676X.2020.1833966

O'Connor, D., Larkin, P., & Williams, A. M. (2018). Observations of youth football training: How do coaches structure training sessions for player development? *Journal of Sports Sciences*, *36*(1), 39–47. https://doi.org/10.1080/02640414.2016.1277034

Ostojic, S. M., Castagna, C., Calleja-González, J., Jukic, I., Idrizovic, K., & Stojanovic, M. (2014). The Biological Age of 14-year-old Boys and Success in Adult Soccer: Do Early Maturers Predominate in the Top-level Game? *Research in Sports Medicine*, *22*(4), 398–407. https://doi.org/10.1080/15438627.2014.944303

Pankhurst, A., & Collins, D. (2013). Talent Identification and Development: The Need for Coherence Between Research, System, and Process. *Quest*, *65*(1), 83–97. https://doi.org/10.1080/00336297.2012.727374

Pankhurst, A., Collins, D., & Macnamara, Á. (2013). Talent development: Linking the stakeholders to the process. *Journal of Sports Sciences*, *31*(4), 370–380. https://doi.org/10.1080/02640414.2012.733821

Papastaikoudis, F., Collins, R., & Collins, D. (2023). Blank canvas or under construction? Examining the pre-academy experiences of young developing professional team sports athletes. *Frontiers in Sports and Active Living*, *5*, 990617. https://doi.org/10.3389/fspor.2023.990617

Parr, J., Winwood, K., Hodson-Tole, E., Deconinck, F. J. A., Hill, J. P., Teunissen, J. W., & Cumming, S. P. (2020a). The Main and Interactive Effects of Biological Maturity and Relative Age on Physical Performance in Elite Youth Soccer Players. *Journal of Sports Medicine*, *2020*, 1–11. https://doi.org/10.1155/2020/1957636

Parr, J., Winwood, K., Hodson-Tole, E., Deconinck, F. J. A., Parry, L., Hill, J. P., Malina, R. M., & Cumming, S. P. (2020b). Predicting the timing of the peak of the pubertal growth spurt in elite male youth soccer players: Evaluation of methods. Annals of Human Biology, 47(4), 400–408. https://doi.org/10.1080/03014460.2020.1782989

Paul, D. J., Gabbett, T. J., & Nassis, G. P. (2016). Agility in Team Sports: Testing, Training and Factors Affecting Performance. *Sports Medicine*, *46*(3), 421–442. https://doi.org/10.1007/s40279-015-0428-2

Peirce, C. S. (1903). *Peirce, C. S. (1903). Harvard Lectures on Pragmatism*.

Peirce, C. S. (1905). *Peirce, C. S. (1905). Review of Nichols' A treatise on cosmology. In H. S. Thayer (Ed.) (1984), Meaning and action: A critical history of pragmatism. (Pp. 493-495). Indianapolis: IN: Hackett*.

Price, A., & Collins, D. (2022). Contributing to a Coaching Team's Shared Mental Model of Player Game Understanding: An Intervention within High-Level Youth Soccer. *Journal of Sport Psychology in Action*, 1–15. https://doi.org/10.1080/21520704.2022.2103224

Price, A., Collins, D., Stoszkowski, J., & Pill, S. (2020). Strategic Understandings: An Investigation of Professional Academy Youth Soccer Coaches' Interpretation, Knowledge, and Application of Game Strategies. *International Sport Coaching Journal*, *7*(2), 151–162. https://doi.org/10.1123/iscj.2019-0022

Radnor, J. M., Staines, J., Bevan, J., Cumming, S. P., Kelly, A. L., Lloyd, R. S., & Oliver, J. L. (2021). Maturity Has a Greater Association than Relative Age with Physical Performance in English Male Academy Soccer Players. *Sports*, *9*(12), 171. https://doi.org/10.3390/sports9120171

Read, P. J., Oliver, J. L., De Ste Croix, M. B. A., Myer, G. D., & Lloyd, R. S. (2016). The scientific foundations and associated injury risks of early soccer specialisation. *Journal of Sports Sciences*, *34*(24), 2295–2302. https://doi.org/10.1080/02640414.2016.1173221

Reeves, C. W., Nicholls, A. R., & McKenna, J. (2009). Stressors and Coping Strategies among Early and Middle Adolescent Premier League Academy Soccer Players: Differences

According to Age. *Journal of Applied Sport Psychology*, *21*(1), 31–48. https://doi.org/10.1080/10413200802443768

Reeves, M. J., Enright, K. J., Dowling, J., & Roberts, S. J. (2018). Stakeholders' understanding and perceptions of bio-banding in junior-elite football training. *Soccer & Society*, 1–17. https://doi.org/10.1080/14660970.2018.1432384

Relvas, H., Littlewood, M., Nesti, M., Gilbourne, D., & Richardson, D. (2010). Organizational Structures and Working Practices in Elite European Professional Football Clubs: Understanding the Relationship between Youth and Professional Domains. *European Sport Management Quarterly*, *10*(2), 165–187. https://doi.org/10.1080/16184740903559891

Rescher, N. (2014). *The pragmatic vision: Themes in philosophical pragmatism*. Rowman & Littlefield.

Richardson, D., Gilbourne, D., & Littlewood, M. (2004). Developing support mechanisms for elite young players in a professional soccer academy: Creative reflections in action research. *European Sport Management Quarterly*, *4*(4), 195–214. https://doi.org/10.1080/16184740408737477

Roberts, S. J., McRobert, A. P., Rudd, J., Enright, K., & Reeves, M. J. (2021). Research in Another un-Examined (RAE) context. A chronology of 35 years of relative age effect research in soccer: Is it time to move on? *Science and Medicine in Football*, *5*(4), 301–309. https://doi.org/10.1080/24733938.2020.1841278

Roca, A., Williams, A. M., & Ford, P. R. (2012). Developmental activities and the acquisition of superior anticipation and decision making in soccer players. *Journal of Sports Sciences*, *30*(15), 1643–1652. https://doi.org/10.1080/02640414.2012.701761

Roche, A. F., Tyleshevski, F., & Rogers, E. (1983). Non-Invasive Measurements of Physical Maturity in Children. *Research Quarterly for Exercise and Sport*, *54*(4), 364–371. https://doi.org/10.1080/02701367.1983.10605321

Rodriguez-Martinez, A., Zhou, B., Sophiea, M. K., Bentham, J., Paciorek, C. J., Iurilli, M. L., Carrillo-Larco, R. M., Bennett, J. E., Di Cesare, M., Taddei, C., Bixby, H., Stevens, G. A., Riley, L. M., Cowan, M. J., Savin, S., Danaei, G., Chirita-Emandi, A., Kengne, A. P., Khang, Y.-H., … Ezzati, M. (2020). Height and body-mass index trajectories of school-aged children and adolescents from 1985 to 2019 in 200 countries and territories: A pooled analysis of 2181 population-based studies with 65 million participants. *The Lancet*, *396*(10261), 1511–1524. https://doi.org/10.1016/S0140-6736(20)31859-6

Romann, M., & Cobley, S. (2015). Relative Age Effects in Athletic Sprinting and Corrective Adjustments as a Solution for Their Removal. *PLOS ONE*, *10*(4), e0122988. https://doi.org/10.1371/journal.pone.0122988

Romann, M., Lüdin, D., & Born, D.-P. (2020). Bio-banding in junior soccer players: A pilot study. *BMC Research Notes*, *13*(1), 240. https://doi.org/10.1186/s13104-020-05083-5

Rongen, F., McKenna, J., Cobley, S., Tee, J. C., & Till, K. (2020). Psychosocial outcomes associated with soccer academy involvement: Longitudinal comparisons against aged matched school pupils. *Journal of Sports Sciences*, *38*(11–12), 1387–1398. https://doi.org/10.1080/02640414.2020.1778354

Rorty, R. (1980). Pragmatism, Relativism, and Irrationalism. *Proceedings and Addresses of the American Philosophical Association*, *53*(6), 717. https://doi.org/10.2307/3131427

Rorty, R. (1982). *Consequences of pragmatism: Essays, 1972-1980*. University of Minnesota Press.

Rorty, R. (1990). Introduction: Pragmatism as anti-representationalism. In *In J.P. Murphy, Pragmatism: From Peirce to Davidson.*

Rowley, S. R. W., & Graham, P. J. (2006). Intensive training in youth sport: An example of unequal opportunity. *Children and Society*, *13*(2), 119–129. https://doi.org/10.1111/j.1099-0860.1999.tb00113.x

*Royal Belgian Football Association.* (2019). https://s3.eu-central-1.amazonaws.com/belgianfootball/s3fs-public/rbfa/docs/pdf/U16futures_fournationstournament_2019.pdf

Rubia, A. de la, Bjørndal, C. T., Sánchez-Molina, J., Yagüe, J. M., Calvo, J. L., & Maroto-Izquierdo, S. (2020). The relationship between the relative age effect and performance among athletes in World Handball Championships. *PLOS ONE*, *15*(3), e0230133. https://doi.org/10.1371/journal.pone.0230133

Ruf, L., Cumming, S., Härtel, S., Hecksteden, A., Drust, B., & Meyer, T. (2021). Construct validity of percentage of predicted adult height and BAUS skeletal age to assess biological maturity in academy soccer. *Annals of Human Biology*, *48*(2), 101–109. https://doi.org/10.1080/03014460.2021.1913224

Sæther, S. A., Feddersen, N., Andresen, E., & Bjørndal, C. T. (2022). Balancing sport and academic development: Perceptions of football players and coaches in two types of Norwegian school-based dual career development environments. *International Journal of Sports Science & Coaching*, *17*(6), 1270–1282. https://doi.org/10.1177/17479541221111462

Salter, J., Johnson, D., & Towlson, C. (2021). *A stitch in time saves nine: The importance of biological maturation for talented athlete development*. The Sport and Exercise Scientist, British Association of Sport and Exercise Sciences.

https://www.bases.org.uk/imgs/_real_world___pg20_21___bases_tses_autumn_2021_online764.pdf

Sarmento, H., Anguera, M. T., Pereira, A., & Araújo, D. (2018). Talent Identification and Development in Male Football: A Systematic Review. *Sports Medicine*, *48*(4), 907–931. https://doi.org/10.1007/s40279-017-0851-7

Savage, J., Collins, D., & Cruickshank, A. (2017). Exploring Traumas in the Development of Talent: What Are They, What Do They Do, and What Do They Require? *Journal of Applied Sport Psychology*, *29*(1), 101–117. https://doi.org/10.1080/10413200.2016.1194910

Savage, J., Collins, D., & Cruickshank, A. (2022). Perspective, control, and confidence: Perceived outcomes of using psycho-behavioural skills in the developmental trauma experience. *International Journal of Sport and Exercise Psychology*, *20*(2), 377–396. https://doi.org/10.1080/1612197X.2021.1877323

Sawilowsky, S. S. (2009). New Effect Size Rules of Thumb. *Journal of Modern Applied Statistical Methods*, *8*(2), 597–599. https://doi.org/10.22237/jmasm/1257035100

*Schoolboy Football Association of Ireland*. (2023). https://sfai.ie/#:~:text=The%20SFAI%20is%20the%20governing,the%20Football%20Association%20of%20Ireland.

Schroepf, B., & Lames, M. (2018). Career patterns in German football youth national teams – A longitudinal study. *International Journal of Sports Science & Coaching*, *13*(3), 405–414. https://doi.org/10.1177/1747954117729368

Sieghartsleitner, R., Zuber, C., Zibung, M., & Conzelmann, A. (2018). "The Early Specialised Bird Catches the Worm!" – A Specialised Sampling Model in the Development of Football Talents. *Frontiers in Psychology*, *9*, 188. https://doi.org/10.3389/fpsyg.2018.00188

Simonton, D. K. (1999). Talent and its development: An emergenic and epigenetic model. *Psychological Review*, *106*(3), 435–457. https://doi.org/10.1037/0033-295X.106.3.435

Simonton, D. K. (2001). Talent Development as a Multidimensional, Multiplicative, and Dynamic Process. *Current Directions in Psychological Science*, *10*(2), 39–43. https://doi.org/10.1111/1467-8721.00110

Sinval, J., Aragão e Pina, J., Sinval, J., Marôco, J., Santos, C. M., Uitdewilligen, S., Maynard, M. T., & Passos, A. M. (2020). Development of the Referee Shared Mental Models Measure (RSMMM). *Frontiers in Psychology*, *11*, 550271. https://doi.org/10.3389/fpsyg.2020.550271

Smith, B., & McGannon, K. R. (2018). Developing rigor in qualitative research: Problems and opportunities within sport and exercise psychology. *International Review of Sport and Exercise Psychology*, *11*(1), 101–121. https://doi.org/10.1080/1750984X.2017.1317357

Smith, M., & Cushion, C. J. (2006). An investigation of the in-game behaviours of professional, top-level youth soccer coaches. *Journal of Sports Sciences*, *24*(4), 355–366. https://doi.org/10.1080/02640410500131944

Soberlak, P., & Cote, J. (2003). The Developmental Activities of Elite Ice Hockey Players. *Journal of Applied Sport Psychology*, *15*(1), 41–49. https://doi.org/10.1080/10413200305401

Solomon-Moore, E., Emm-Collison, L. G., Sebire, S. J., Toumpakari, Z., Thompson, J. L., Lawlor, D. A., & Jago, R. (2018). "In my day…"- Parents' Views on Children's Physical Activity and Screen Viewing in Relation to Their Own Childhood. *International Journal of Environmental Research and Public Health*, *15*(11), 2547. https://doi.org/10.3390/ijerph15112547

Sothern, N. A., & O'Gorman, J. (2021). Exploring the mental health and wellbeing of professional academy footballers in England. *Soccer & Society*, *22*(6), 641–654. https://doi.org/10.1080/14660970.2021.1952693

Sparkes, A. C., & Smith, B. (2009). Judging the quality of qualitative inquiry: Criteriology and relativism in action. *Psychology of Sport and Exercise*, *10*(5), 491–497. https://doi.org/10.1016/j.psychsport.2009.02.006

Stambulova, N., Alfermann, D., Statler, T., & Côté, J. (2009). ISSP Position stand: Career development and transitions of athletes. *International Journal of Sport and Exercise Psychology*, *7*(4), 395–412. https://doi.org/10.1080/1612197X.2009.9671916

Swainston, S. C., Wilson, M. R., & Jones, M. I. (2020). Player Experience During the Junior to Senior Transition in Professional Football: A Longitudinal Case Study. *Frontiers in Psychology*, *11*, 1672. https://doi.org/10.3389/fpsyg.2020.01672

Swann, C., Moran, A., & Piggott, D. (2015). Defining elite athletes: Issues in the study of expert performance in sport psychology. *Psychology of Sport and Exercise*, *16*, 3–14. https://doi.org/10.1016/j.psychsport.2014.07.004

Talisse, R. B., & Aikin, S. F. (2008). *Pragmatism: A guide for the perplexed*. Continuum.

Tanner, J. M., Whitehouse, R. H., Cameron, N., Marshall, W. A., Healy, M. J. R., & Goldstein, N. H. (2001). *Assessment of Skeletal Maturity and Prediction of Adult Height (TW3 Method)* (3rd Ed). W.B. Saunders.

Taylor, J., Ashford, M., & Collins, D. (2022a). Tough Love—Impactful, Caring Coaching in Psychologically Unsafe Environments. *Sports*, *10*(6), 83. https://doi.org/10.3390/sports10060083

Taylor, J., Ashford, M., & Collins, D. (2022b). The Role of Challenge in Talent Development: Understanding Impact in Response to Emotional Disturbance. *Psych*, *4*(4), 668–694. https://doi.org/10.3390/psych4040050

Taylor, J., & Collins, D. (2019). Shoulda, Coulda, Didnae—Why Don't High-Potential Players Make it? *The Sport Psychologist*, *33*(2), 85–96. https://doi.org/10.1123/tsp.2017-0153

Taylor, J., & Collins, D. (2020). The Highs and the Lows—Exploring the Nature of Optimally Impactful Development Experiences on the Talent Pathway. *The Sport Psychologist*, *34*(4), 319–328. https://doi.org/10.1123/tsp.2020-0034

Taylor, J., & Collins, D. (2021). Getting in the Way: Investigating Barriers to Optimizing Talent Development Experience. 4(3). *Journal of Expertise*, 4(3) 315-332. https://www.journalofexpertise.org/articles/volume4_issue3/JoE_4_3_Taylor_Collins. html

Taylor, J., & Collins, D. (2022a). The talent development curriculum. In C. Nash, *Practical Sports Coaching* (2nd ed., pp. 77–91). Routledge. https://doi.org/10.4324/9781003179733-7

Taylor, J., & Collins, D. (2022b). Navigating the winds of change on the smooth sea—The interaction of feedback and emotional disruption on the talent pathway. *Journal of Applied Sport Psychology*, *34*(4), 886–912. https://doi.org/10.1080/10413200.2021.1894505

Taylor, J., Collins, D., & Cruickshank, A. (2022d). Too Many Cooks, Not Enough Gourmets: Examining Provision and Use of Feedback for the Developing Athlete. The Sport Psychologist, 36(2), 89–100. https://doi.org/10.1123/tsp.2021-0037

Taylor, J., MacNamara, Á., & Taylor, R. D. (2022c). Strategy in talent systems: Top-down and bottom-up approaches. *Frontiers in Sports and Active Living*, *4*, 988631. https://doi.org/10.3389/fspor.2022.988631

*The Irish Times (2021). Irish Involvement Likely to be Sparse in New Premier League Season. The Irish Times.* (n.d.). https://www.irishtimes. com/sport/soccer/irish-involvement-likely-to-be-sparse-in-new-premierleague- season-1.4646194

Thoren, K., Heinig, E., & Brunner, M. (2016). Relative Age Effects in Mathematics and Reading: Investigating the Generalizability across Students, Time and Classes. *Frontiers in Psychology*, *7*. https://doi.org/10.3389/fpsyg.2016.00679

Thurlow, F. G., Kite, R. J., & Cumming, S. P. (2022). Revisiting youth player development in Australian Rules Football: Is there a place for bio-banding? *International Journal of Sports Science & Coaching*, *17*(3), 637–646. https://doi.org/10.1177/17479541211042682

Till, K., & Baker, J. (2020). Challenges and [Possible] Solutions to Optimizing Talent Identification and Development in Sport. *Frontiers in Psychology*, *11*, 664. https://doi.org/10.3389/fpsyg.2020.00664

Till, K., Cobley, S., Morley, D., O'hara, J., Chapman, C., & Cooke, C. (2016). The influence of age, playing position, anthropometry and fitness on career attainment outcomes in rugby league. *Journal of Sports Sciences*, *34*(13), 1240–1245. https://doi.org/10.1080/02640414.2015.1105380

Till, K., Cobley, S., Wattie, N., O'Hara, J., Cooke, C., & Chapman, C. (2009). The prevalence, influential factors and mechanisms of relative age effects in UK Rugby League: Relative age effects in Rugby League. *Scandinavian Journal of Medicine & Science in Sports*, *20*(2), 320–329. https://doi.org/10.1111/j.1600-0838.2009.00884.x

Towlson, C., & Cumming, S. P. (2022). Bio-banding in soccer: Past, present, and future. *Annals of Human Biology*, 1–5. https://doi.org/10.1080/03014460.2022.2129091

Towlson, C., MacMaster, C., Gonçalves, B., Sampaio, J., Toner, J., MacFarlane, N., Barrett, S., Hamilton, A., Jack, R., Hunter, F., Stringer, A., Myers, T., & Abt, G. (2022). The effect of bio-banding on technical and tactical indicators of talent identification in academy soccer players. *Science and Medicine in Football*, *6*(3), 295–308. https://doi.org/10.1080/24733938.2021.2013522

Towlson, C., MacMaster, C., Parr, J., & Cumming, S. (2022). One of these things is not like the other: Time to differentiate between relative age and biological maturity selection biases in soccer? *Science and Medicine in Football*, *6*(3), 273–276. https://doi.org/10.1080/24733938.2021.1946133

Towlson, C., Salter, J., Ade, J. D., Enright, K., Harper, L. D., Page, R. M., & Malone, J. J. (2021). Maturity-associated considerations for training load, injury risk, and physical performance in youth soccer: One size does not fit all. *Journal of Sport and Health Science*, *10*(4), 403–412. https://doi.org/10.1016/j.jshs.2020.09.003

*UEFA (2020). Training Facilities, and Youth Investment Landscape. UEFA (2020).*

*UEFA (2021). Country Coefficients.* https://www.uefa.com/ nationalassociations/uefarankings/country/#/yr/2022.

Vaeyens, R., Lenoir, M., Williams, A. M., & Philippaerts, R. M. (2008). Talent Identification and Development Programmes in Sport: Current Models and Future Directions. *Sports Medicine*, *38*(9), 703–714. https://doi.org/10.2165/00007256-200838090-00001

Vella, S. A., Mayland, E., Schweickle, M. J., Sutcliffe, J. T., McEwan, D., & Swann, C. (2022). Psychological safety in sport: A systematic review and concept analysis. *International Review of Sport and Exercise Psychology*, 1–24. https://doi.org/10.1080/1750984X.2022.2028306

Wall, M., & Côté, J. (2007). Developmental activities that lead to dropout and investment in sport. *Physical Education & Sport Pedagogy*, *12*(1), 77–87. https://doi.org/10.1080/17408980601060358

Walters, S., R., Renshaw, I., Whatman, C., Zoellner, A., Harrison, C., Millar, S., & Pithey, R. (2021). Maturity status, relative age and bio-banding in youth cricket. *New Zealand Cricket Report*, *48*, 66–75.

Ward, P., Hodges, N. J., Starkes, J. L., & Williams, M. A. (2007). The road to excellence: Deliberate practice and the development of expertise. *High Ability Studies*, *18*(2), 119–153. https://doi.org/10.1080/13598130701709715

Weaver, K. (2018). Pragmatic Paradigm. In *The SAGE Encyclopedia of Educational Research, Measurement, and Evaluation*. https://doi.org/10.4135/9781506326139

Webb, V., Collins, D., & Cruickshank, A. (2016). Aligning the talent pathway: Exploring the role and mechanisms of coherence in development. *Journal of Sports Sciences*, *34*(19), 1799–1807. https://doi.org/10.1080/02640414.2016.1139162

Wilhelm, A., Choi, C., & Deitch, J. (2017). Early Sport Specialization: Effectiveness and Risk of Injury in Professional Baseball Players. *Orthopaedic Journal of Sports Medicine*, *5*(9), 232596711772892. https://doi.org/10.1177/2325967117728922

Williams, A. M., & Reilly, T. (2000). Talent identification and development in soccer. *Journal of Sports Sciences*, *18*(9), 657–667. https://doi.org/10.1080/02640410050120041

Williams, G. G., & MacNamara, Á. (2022). Challenge is in the eye of the beholder: Exploring young athlete's experience of challenges on the talent pathway. *Journal of Sports Sciences*, *40*(10), 1078–1087. https://doi.org/10.1080/02640414.2022.2047503

Williams, G., & MacNamara, Á. (2020). "I Didn't Make It, but…": Deselected Athletes' Experiences of the Talent Development Pathway. *Frontiers in Sports and Active Living*, *2*, 24. https://doi.org/10.3389/fspor.2020.00024

Wolfenden, L. E., & Holt, N. L. (2005). Talent Development in Elite Junior Tennis: Perceptions of Players, Parents, and Coaches. *Journal of Applied Sport Psychology*, *17*(2), 108–126. https://doi.org/10.1080/10413200590932416

Wrigley, R., Drust, B., Stratton, G., Scott, M., & Gregson, W. (2012). Quantification of the typical weekly in-season training load in elite junior soccer players. *Journal of Sports Sciences*, *30*(15), 1573–1580. https://doi.org/10.1080/02640414.2012.709265

Wu, Y., Xia, Z., Wu, T., Yi, Q., Yu, R., & Wang, J. (2020). Characteristics and optimization of core local network: Big data analysis of football matches. *Chaos, Solitons & Fractals*, *138*, 110136. https://doi.org/10.1016/j.chaos.2020.110136

Zibung, M., & Conzelmann, A. (2013). The role of specialisation in the promotion of young football talents: A person-oriented study. *European Journal of Sport Science*, *13*(5), 452–460. https://doi.org/10.1080/17461391.2012.749947

Zuber, C., Zibung, M., & Conzelmann, A. (2016). Holistic Patterns as an Instrument for Predicting the Performance of Promising Young Soccer Players – A 3-Years Longitudinal Study. *Frontiers in Psychology*, *7*. https://doi.org/10.3389/fpsyg.2016.01088

# Appendices

| Appendix | Appendix Title |
| --- | --- |
| A | Plain Language Statement – Chapter 4 |
| B | Informed Consent Form – Chapter 4 |
| C | Semi-structured Interview Guide – Chapter 4 |
| D | Plain Language Statement for Parents – Chapter 5 and 6 |
| E | Plain Language Statement for Players – Chapter 5 and 6 |
| F | Parental Consent Form – Chapter 5 and 6 |
| G | Child Assent Form – Chapter 5 and 6 |
| H | Plain Language Statement – Chapter 8 |
| I | Plain Language Statement for Players – Chapter 8 |
| J | Parental Consent Form – Chapter 8 |
| K | Child Assent Form – Chapter 8 |
| L | Semi-structured Interview Guide – Chapter 8 |
| M | Letter of Ethical Approval – Chapter 4 |
| N | Letter of Ethical Approval – Chapter 5 and 6 |
| O | Letter of Ethical Approval – Chapter 8 |

**Appendix A. Plain Language Statement – Chapter 4**



# Plain language statement

You are invited to take part in a research study titled 'Stakeholder Perspectives of The Implementation of a National Academy and League Structure in Underage Irish Football'. This research is being undertaken by Dublin City University in conjunction with the Football Association of Ireland. The principal investigators for this research study are:

Mr Liam Sweeney, Ph.D. student at the School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland
Email: Liam.sweeney23@mail.dcu.ie
And

Dr Áine MacNamara, Associate Professor in Elite Performance, The School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland
Email: Aine.macnamara@dcu.ie

**Please take your time to read the information provided on this plain language statement before making any decisions about participation in this research.**

What is this research about?
The aim of this research is to explore the level of stakeholder coherence across the FAI development pathway, and the extent to which the key stakeholders share a common understanding of, and alignment to, talent development principles.

Why is this research being conducted?
It is important that we examine how the design of the underage development pathway in Irish football impacts across multiple stakeholders, including coaches, athletes, parents, and management. This information will support the refinement of the FAI talent development pathway, ensuring it is optimal in developing elite players nationally and internationally.

1

What will I be required to do if I participate?

You will be required to attend one online video interview via Zoom for a duration of approximately 60-minutes, to discuss your perceptions of the strengths, weaknesses, opportunities, and challenges of the development pathway in Irish football, implemented as part of the Player Development Plan by the FAI. This interview will be between you and the principal investigator. All interviews will be recorded and transcribed. You will be sent a private and password-protected zoom link via email at least one week prior to interview. On the date and time of your interview, you may log into your personal zoom meeting. You will remain in the waiting room of your zoom meeting until the principal investigator (s) grants you access to the meeting room. Your interview will take place within the online meeting room.

What additional security considerations will be put in place for my zoom interview?

· The meeting will be locked prior to the start of the interview to ensure that no one else may join

· The zoom meeting will be encrypted to ensure your privacy and anonymity is respected

· Unique meeting IDs are required for each scheduled meeting

· Interviews will take place between the principal investigator and each participant only

· All meetings will take place using the DCU licenced version of zoom to comply with data protection requirements

What are the benefits of taking part in this research study?

You will contribute to research that may have future implications for the evaluation and refinement of the underage infrastructure in Irish football.

Data protection and privacy notice

· Mr. Liam Sweeney and Dr. Áine MacNamara are the data controllers and data processors for this research study. A data processor may hold or process personal data but does not exercise responsibility for or control over the personal data.

- You have the right to access your own personal data. For enquiries contact the Data Protection Officer at Dublin City University, Mr. Martin Ward (**Email**: data.protection@dcu.ie **Phone:** 7005118 / 7008257)

- It is important that you understand how the data collection from the interview that you participate in will be collected and used for this research study. We are required by law to provide you with this information before you decide whether to participate in this research. This study will use your personal information under two legal bases as defined by the General Data Protection Regulations 2016: Because we feel this study is important for scientific research (Article 9(2)(i)) and because we feel the information you provide could be important for public interest (Article 6(1)(f)).

- This study is completely confidential. You will be assigned a code number and will not be identified by name. Consent forms will be secured in an encrypted electronic DCU file. Results from this study will be used by the principal investigators to write a report that may be published and presented publicly. All data will be presented anonymously, individuals will not be identified. Your participation in this research will not affect your ongoing relationship with the FAI.

- The information you provide in this research will be shared with the FAI High Performance department.

- There will be no automated decision-making or profiling of your personal data in this study. This means that we will not use your personal data to make any predictions about you. Your information will not be processed for any other reason than for this study and it will not be transferred to any other country or organisation.

- Upon publication of the study and a period of 12 months, all personal data will be deleted.

- It is important that you know that confidentiality of information can only be protected within the limitations of the law - i.e., it is possible for data to be subject to subpoena, freedom of information claim or mandated reporting by some professions.

- Your participation in this research is voluntary. You can withdraw from this study at any time without giving a reason. If you withdraw, any data identifiable to you will be deleted and information about your involvement will be discarded. If the data has already been anonymised and aggregated with other data, it will not be possible to identify and remove it, but it will not be possible to identify you from this aggregated data set. You can contact the researcher at liam.sweeney23@mail.dcu.ie if you have questions about this.

- Please visit  *https://www.dcu.ie/ocoo/dp/guides.shtml* for more information

What are my rights?

- You have the right to lodge a complaint with the Irish Data Protection Commission if you are dissatisfied.

· You have the right to restrict or object to processing of your information.

· You have the right to have any inaccurate information about you corrected or deleted. For example, you have the right to look over and edit the transcript of any interview with you.

· You have the right to ask for any of your information in a readable format.

How will I find out what happens with the project?

You may contact the principal investigator to receive feedback from this research if you wish. All information from this study will be in non-specific order to preserve anonymity and will be available within 12 months after completion of this study.

 If you need any further information now or at any time in the future, please contact:
**Name:** Liam Sweeney
**Academic supervisor:** Áine MacNamara
**Address:** School of Health and Human Performance, Dublin City University, Glasnevin, Dublin 9, Ireland.
**Email:** liam.sweeney23@mail.dcu.ie
**If you have concerns about this study and wish to contact an independent person, please contact:**
**The Secretary, Dublin City University Research Ethics Committee, c/o Research and Innovation Support, Dublin City University, Dublin 9.  Tel 01-7008000, e-mail** rec@dcu.ie

**Appendix B. Participant Informed Consent Form – Chapter 4**



# <u>Participant informed consent form</u>

You are invited to take part in a research study titled 'Stakeholder Perspectives of The Implementation of a National Academy and League Structure in Underage Irish Football'. The principal investigators and the data controllers for this research study are:

Mr Liam Sweeney, Ph.D. student at the School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland

Email: Liam.sweeney23@mail.dcu.ie

And

Dr Áine MacNamara, Associate Professor in Elite Performance, The School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland

Email: Aine.macnamara@dcu.ie

<u>What is the purpose of this research?</u>
The purpose of this research is to explore the coherence within the FAI development pathway and the extent to which key stakeholders share a common understanding of, and alignment to, talent development principles.

<u>What will I be required to do?</u>
You will be required to attend one online video interview via zoom for a duration of approximately 60-minutes, to discuss your perceptions of the strengths, weaknesses,

opportunities, and challenges of the player pathway and the underage League of Ireland implemented by the FAI under the Player Development Plan. You will be asked to discuss your opinions on various aspects of the youth development infrastructure of Irish football. This interview will be between you and the principal investigator. You will be sent a zoom link via email at least one week prior to the interview. You will be required to login into your meeting with your unique and private Zoom meeting ID. Once logged into the zoom meeting, you will be briefed about the procedure of the interview, alongside some warm-up questions. Your interview will then subsequently take place. Your interview will be recorded for subsequent transcription and analysis.

<u>Participant – please complete the following (Circle Yes or No for each question)</u>

| | |
|---|---|
| I have read the Plain Language Statement (or had it read to me) | Yes/No |
| I understand the information provided | Yes/No |
| I understand the information provided in relation to data protection | Yes/No |
| I have had an opportunity to ask questions and discuss this study | Yes/No |
| I have received satisfactory answers to all my questions | Yes/No |
| I am aware that my interview will be audiotaped | Yes/No |

This study is completely confidential. You will be assigned a code number and will not be identified by name. Consent forms will be secured in an encrypted electronic DCU file. Results from this study will be used by the principal investigators to write a report that may be published and presented publicly. All data will be presented anonymously, individuals will not be identified. Your information will not be processed for any other reason than for this study and it will not be transferred to any other country or organisation. Your personal data will be retained until publication for a period of 6 months. Upon completion of the study and publication, all personal data will be permanently deleted.

It is important that you understand that confidentiality of information can only be protected within the limitations of the law - i.e., it is possible for data to be subject to subpoena, freedom of information claim or mandated reporting by some professions.

Your participation in this research is voluntary. You can withdraw from this study at any time without giving a reason. If you withdraw, any data identifiable to you will be deleted and information about your involvement will be discarded. If the data has already been anonymised

and aggregated with other data, it will not be possible to identify and remove it, but it will not be possible to identify you from this aggregated data set. You can contact the researcher at liam.sweeney23@mail.dcu.ie if you have questions about this.

## **Signature:**

I have read and understood the information in this form. My questions and concerns have been answered by the researchers, and I have a copy of this consent form. Therefore, I consent to take part in this research project

Participants Signature:

Name in Block Capitals:

Witness:

Date:

**Appendix C. Semi structured interview guide – Chapter 4**

**What is your understanding of the FAI player pathway?**

    a. What is your role in it in your context?

    b. How has it worked so far from your perspective?

    c. What do you think the objective is? Are these the right things in your opinion?

    d. How does that influence what you do in your role?

**What is the objective of the underage national leagues?**

    a. How does that influence what you do in your role?

    b. What are the objectives of the grassroots clubs? Are these the right things in your opinion?

**How much sporting activity during the week should be devoted to football relative to other sports?**

    a. How does this work during a normal week? What does a normal week look like?

    b. Is this approach best suited to developing footballers as effectively as more/less other sports?

    c. Why do you think this?

**What is the experience like for a player in a LOI academy?**

    a. What is the experience like for a player in a grassroots environment?

    b. Examples of similarities/differences?

    c. Perception of coaching in each?

**What criteria is used to select players in and out of the pathway? What do you/coaches look for in the players that are being selected?**

    a. Physical size?

    b. Does that influence how you coach?

    c. Are these factors the right thing in your opinion?

    d. Selection at a dynamic stage, what other factors do you need to consider?

**Do you think U14 is the right age for the underage LOI to begin?**

    a. Why? Maturation/growth?

    b. Why not?

    c. Other factors to consider?

**One of the key things in player development is that there is a need to challenge young players appropriately. Do current structures do this?**

    a. How does it work well?

    b. How can it be better?

    c. Is there an open and revolving door policy in LOI academies? (in an out of the system, multiple entry, exit and re- entry points)

    d. Can you tell me about the quality of coaching young players get before and during this phase?

    e. Give examples

**How well do you think the system works together?**

    a.  Do you cooperate and communicate?

    b.  Is the system seen as one or not?

    c.  What about parents?

    d.  How does/ doesn't this communication facilitate ins and outs of the pathway?

**Note to self - Check through guide and notes. Finish with:**

    -  Is there anything else that impacts the player pathway?

    -  Is there anything that you thought I might ask you about, but didn't?

**Appendix D. Plain Language Statement for Parents – Chapter 5 and 6**



# Plain language statement for Parents

Your child is invited to take part in a research study titled 'Examining biological maturation in the Football Association of Ireland National player pathway". The principal investigators for this research study are:

Mr Liam Sweeney, Ph.D. student at the School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland
Email: Liam.sweeney23@mail.dcu.ie

And

Dr Áine MacNamara, Associate Professor in Elite Performance, The School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland
Email: Aine.macnamara@dcu.ie

**This research project is being endorsed by the Football Association of Ireland.**
**This research is funded by the Irish Research Council.**

**Please take your time to read the information provided on this plain language statement before making any decisions about your child's participation in this research.**

<u>What is this research about?</u>
The aim of this research is to examine the biological maturity status of players who enter the FAI national player pathway in the 2022 season. We can then compare what proportion of our players are early, on-time, or late maturing from a biological perspective.

<u>Why is this research being conducted?</u>
Biological maturation can heavily influence the talent identification process and the subsequent opportunities young players receive in their developmental journey. It is important that we examine and monitor how biologically mature each player who enters the academy is. This will help us to optimise the talent identification process as well as understand at what stage each of our players are at in their physical development. We can use this information to maximise training and playing opportunities for players so that they get the best experience during their time in the academy.

<u>What will my child do?</u>
We will measure your child's height and weight. We will also require both parents to self-report their height. We will use equations from your child's measurements and your measurements to predict your child's future adult height. We can then compare your child's current height and his predicted adult height to calculate how biologically mature your child is. We can then categorise your child as either early, on-time, or late maturing.

<u>What are the benefits of taking part in this research study?</u>
This research is the first of its kind to take biological maturation assessments within the National system. This research will enhance our limited understanding on the association between biological maturity and player selection in Irish football. We can this information to maximise training and playing opportunities for players so that they get the best experience during their time in the academy.

<u>Data protection and privacy notice</u>
- Dublin City University are the data controller and data processor for this research study. A data processor may hold or process personal data but does not exercise responsibility for or control over the personal data.
- You have the right to access your child's personal data. For enquiries contact the Data Protection Officer at Dublin City University, Mr. Martin Ward (**Email**: data.protection@dcu.ie **Phone:** 7005118 / 7008257)
- It is important that you understand how the data collection from this research study will be collected and used for this research. We are required by law to provide you with this information before you decide whether you consent for your child to participate in this research. This study will use your child's personal information under two legal bases as defined by the General Data Protection Regulations 2016: Because we feel this study is important for scientific research (Article 9(2)(i)) and because we feel the information provided could be important for public interest (Article 6(1)(f)).
- This study is completely confidential. Your child will be assigned a code number and will not be identified by name. Consent forms will be secured in an encrypted electronic DCU file. Results from this study will be used by the principal investigators to write a report that may be published and presented publicly. All data will be presented anonymously, individuals will not be identified.

- We will also require your child to provide written consent to participate in this research.
- There will be no automated decision-making or profiling of your child's personal data in this study. This means that we will not use your child's personal data to make any predictions about them. Their information will not be processed for any other reason than for this study and it will not be transferred to any other country or organisation.
- Your child's personal data will be retained until after the PhD candidate (Liam Sweeney) has been examined and the degree awarded, at which point it will then be permanently deleted. The upper retention limit for the storage of this data is September 2024.
- It is important that you know that confidentiality of information can only be protected within the limitations of the law - i.e., it is possible for data to be subject to subpoena, freedom of information claim or mandated reporting by some professions.
- Your child's participation in this research is voluntary. They may withdraw from this study at any time without giving a reason. If they withdraw, any data identifiable to them will be deleted and information about their involvement will be discarded. You can contact the researcher at liam.sweeney23@mail.dcu.ie if you have questions about this.
- Please visit https://www.dcu.ie/ocoo/dp/guides.shtml for more information

What are my and my child's rights?
- You/your child have the right to lodge a complaint with the Irish Data Protection Commission if you are dissatisfied.
- You/your child have the right to restrict or object to processing of your/your child's information.
- You/your child have the right to have any inaccurate information about you/your child corrected or deleted.
- You/your child have the right to ask for any of your/your child's information in a readable format.

How will I find out what happens with the project?
You may contact the principal investigator to receive feedback from this research if you wish. All information from this study will be in non-specific order to preserve anonymity and will be available within 12 months after completion of this study.

If you need any further information now or at any time in the future, please contact:
**Name:** Liam Sweeney
**Academic supervisor:** Áine MacNamara
**Address:** School of Health and Human Performance, Dublin City University, Glasnevin, Dublin 9, Ireland.
**Email:** liam.sweeney23@mail.dcu.ie

**If you have concerns about this study and wish to contact an independent person, please contact:**

**The Secretary, Dublin City University Research Ethics Committee, c/o Research and Innovation Support, Dublin City University, Dublin 9. Tel 01-7008000, e-mail** rec@dcu.

# Plain Language Statement for players

**What is this research about?**

The aim of this research is to measure your height and weight to estimate how tall you will be as an adult. We can then use this information to see how close you are to your adult height at this moment in time. This will allow us to assess what stage you are at in your physical development. We can then draw comparisons across other players in the FAI National Academy to see what stage each player is at in their physical development.

**Here is some information about how the programme will work:**

· We will measure your height and weight once.
· We will also record the height of your parents.
· We will use your measurements and compare them to your parents' measurements to estimate how tall you will be when you become an adult.

**What else do I need to know?**

- If you do not feel comfortable taking part in this research, we will stop immediately. You won't have to take part in this research after that.
- I will write about the research in my university project, but I will never use your name.
- I will keep any forms that you sign in a password-protected electronic file that no one else will have access to.
- I will keep all your measurements in a password protected electronic file on a computer that no one else will have access to.
- I will keep the information until my research project and my exams are finished. After that, I will safely delete the information.

**Who can I speak to if I have any questions?**

If you and/or your parent(s)/guardian(s) have any questions about this project, please contact the lead researcher:

**Name:** Liam Sweeney

**Work Address:** Albert College Building, The School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland

**Email:** liam.sweeney23@mail.dcu.ie

**Or**

If you and/or your parent(s)/guardian(s) have concerns about this project and wish to contact an independent person, please contact:

The Secretary, Dublin City University Research Ethics Committee, c/o Research and Innovation Support, Dublin City University, Dublin 9. Tel 01-7008000, e-mail rec@dcu.ie

**Appendix F. Parental Consent Form – Chapter 5 and 6**



# Parental consent form

Your child is invited to take part in a research study titled 'Examining biological maturation in the Football Association of Ireland national player pathway" The principal investigators for this research study are:

Mr Liam Sweeney, Ph.D. student at the School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland
Email: Liam.sweeney23@mail.dcu.ie

And

Dr Áine MacNamara, Associate Professor in Elite Performance, The School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland
Email: Aine.macnamara@dcu.ie

**This research project is being supported and endorsed by the Football Association of Ireland.**
**This research is funded by the Irish Research Council.**

<u>What is the purpose of this research?</u>
The aim of this research is to examine the biological maturity status of players who enter the FAI National player pathway in the 2022 season. We can then compare what proportion of our players are early, on-time, or late maturing from a biological perspective.

<u>What will my child do?</u>
We will measure your child's height and weight. We will also require both parents to self-report their height. We will use equations from your child's measurements and your measurements to predict your child's future adult height. We can then compare your child's

1

current height and his predicted adult height to calculate how biologically mature your child is. We can then categorise your child as either early, on-time, or late maturing.

<u>Parents/guardian – please complete the following (Circle Yes or No for each question)</u>

I have read the Plain Language Statement (or had it read to me) Yes/No
I understand the information provided Yes/No
I understand the information provided in relation to data protection Yes/No
I have had an opportunity to ask questions and discuss this study Yes/No
I have received satisfactory answers to all my questions Yes/No
This study is completely confidential. Your child will be assigned a code number and will not be identified by name. Consent forms will be secured in an encrypted electronic DCU file. Results from this study will be used by the principal investigators to write a report that may be published and presented publicly. All data will be presented anonymously, individuals will not be identified. Your child's information will not be processed for any other reason than for this study and it will not be transferred to any other country or organisation. Your child's personal data will be retained until after the PhD candidate (Liam Sweeney) has been examined and the degree awarded, at which point it will then be permanently deleted. The upper retention limit for the storage of this data is September 2024. It is important that you know that confidentiality of information can only be protected within the limitations of the law - i.e., it is possible for data to be subject to subpoena, freedom of information claim or mandated reporting by some professions. Your child's participation in this research is voluntary. They may withdraw from this study at any time without giving a reason. If they withdraw, any data identifiable to them will be deleted and information about their involvement will be discarded. You can contact the researcher at liam.sweeney23@mail.dcu.ie if you have questions about this.

I have read and understood the information in this form. My questions and concerns have been answered by the researchers, and I have a copy of this consent form. Therefore, I consent for my child to take part in this research project.

Parents Signature:

Parent name in Block Capitals:

Name of child:

Witness:

Date:

**Appendix G. Player Assent Form – Chapter 5 and 6**



# Player assent form

• I have had the details of this research project explained to me
• I understand that I will have my height and weight measured on one occasion during my time in the FAI National Academy
• I understand that these measurements will be used to make predictions about my adult height and maturation status
• I know that I can withdraw from this research project at any time if I want to
• I understand that this is a research project that will be written up as a report
• I am happy to speak to a member of this research team or a member of the FAI National Academy Staff if I have any questions or concerns

I agree to take part in this maturation status research

Name:

Witness:

Date:

**Appendix H. Plain Language Statement for Parents/guardians – Chapter 8**



# <u>Plain language statement for parents/guardians</u>

Your child is invited to take part in a research study titled "Examining the talent development environment: The role of challenge"
The principal investigators for this research study are:

Mr Liam Sweeney, Ph.D. student at the School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland Email: Liam.sweeney23@mail.dcu.ie

And

Dr Áine MacNamara, Associate Professor in Elite Performance, The School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland
Email: Aine.macnamara@dcu.ie

**This research is funded by the Irish Research Council.**
**Please take your time to read the information provided on this plain language statement before making any decisions about your child's participation in this research.**

**<u>What is this research about?</u>**
The aim of this research is to explore players' experiences of the Irish player pathway at the national level and their perceptions of the positive and negative developmental experiences of young players.

**<u>Why is this research being conducted?</u>**
This research study aims to examine the experiences of navigating the "highs and lows" of development through the lens of players. It is crucial to identify the challenges players

experience during their time within the national talent pathway and the impact that such challenges have.

**What will I be required to do if I participate?**
Your child will be required to attend one online video interview via Zoom for a duration of approximately 30-minutes every month with Liam Sweeney to discuss their experiences of the player pathway and player development over the course of the season. This interview will be between your child, yourself and the principal investigator only. Parents/guardians are required to be present during all interviews. All interviews will be recorded and transcribed. Please note that as interviews will be recorded on zoom, interviews will be audiotaped and videotaped as part of the interview process. Your child may turn the camera off from the video recording if they wish. You will be sent a private and password-protected zoom link via email at least one week prior to interview. On the date and time of the interview, you and your child may log into your personal zoom meeting. You will remain in the waiting room of your zoom meeting until the principal investigator (s) grants you access to the meeting room. Your interview will take place within the online meeting room.

**What additional security considerations will be put in place for my interview?**
- The meeting will be locked prior to the start of the interview to ensure that no one else may join
- The zoom meeting will be encrypted to ensure your child's privacy and anonymity is respected
- Unique meeting IDs are required for each scheduled meeting
- All meetings will take place using the DCU licenced version of zoom to comply with data protection requirements
- The video will be recorded but deleted immediately upon completion of the interview and only the audio will be retained. The audio will be deleted after transcription.

**What are the risks of taking part in this research study?**
A potential risk of this research is that you and your child will be required to provide your names and email address. To minimise this risk to your child, all information provided will be coded and pseudo-anonymised. Only the principal researcher will have access to your names. Your names, relevant personal information, codes, and recorded interviews and transcripts will be stored on a password protected file on the DCU google drive. All data obtained will be pseudo-anonymised and your child will be unidentifiable. The data will be held/retained until after the PhD candidate Liam Sweeney has been examined and the degree awarded, to which it will then be permanently deleted. The upper retention limit for the storage of this data is September 2024. No names or personal information will be used during study analysis, discussion, or publication.

**Data protection and privacy notice**
- Mr Liam Sweeney is the data controller and data processor for this research study. A data processor may hold or process personal data but does not exercise responsibility for or control over the personal data.

- You/your child have the right to access their own personal data. For enquiries contact the Data Protection Officer at Dublin City University, Mr. Martin Ward (**Email**: data.protection@dcu.ie **Phone:** 7005118 / 7008257)
- It is important that you understand how the data collection from the interview that your child participates in will be collected and used for this research study. We are required by law to provide you with this information before you decide whether you and your child are to participate in this research. This study will use your personal information under two legal bases as defined by the General Data Protection Regulations 2016: Because we feel this study is important for scientific research (Article 9(2)(i)) and because we feel the information provided could be important for public interest (Article 6(1)(f)).
- Your child will be assigned a code number and will not be identified by name. You and your child will be asked to return a signed consent form via a google form. Consent forms will be secured in an encrypted electronic DCU file. Results from this study will be used by the principal investigators to write a report that may be published and presented publicly. All data will be presented anonymously, individuals will not be identified.
- There will be no automated decision-making or profiling of your child's personal data in this study. This means that we will not use your child's personal data to make any predictions about them. Your child's information will not be processed for any other reason than for this study and it will not be transferred to any other country or organisation.
- In accordance with DCU's data retention policy and GDPR, the data will be held/retained until after the PhD candidate Liam Sweeney has been examined and the degree awarded, to which it will then be permanently deleted. The upper retention limit for the storage of this data is September 2024.
- It is important that you know that confidentiality of information can only be protected within the limitations of the law - i.e., it is possible for data to be subject to subpoena, freedom of information claim or mandated reporting by some professions.
- Your child's participation in this research is voluntary. Your child can withdraw from this study at any time without giving a reason. If they withdraw, any data identifiable to you will be deleted and information about their involvement will be discarded. If the data has already been anonymised and aggregated with other data, it will not be possible to identify and remove it, but it will not be possible to identify them from this aggregated data set. You can contact the researcher Liam.sweeney23@mail.dcu.ie if you have questions about this.
- Please visit *https://www.dcu.ie/ocoo/dp/guides.shtml* for more information

**What are my rights?**
  · You/your child have the right to lodge a complaint with the Irish Data Protection Commission if you are dissatisfied.
  · You/your child have the right to restrict or object to processing of your information.

- You/your child have the right to have any inaccurate information about you corrected or deleted. For example, you have the right to look over and edit the transcript of any interview with you.
- You/your child have the right to ask for any of your information in a readable format.

**<u>How will I find out what happens with the project?</u>**
All information from this study will be in non-specific order to preserve anonymity and will be available within 12 months after completion of this study.
If you need any further information now or at any time in the future, please contact:
**Mr Liam Sweeney**
**Address:** School of Health and Human Performance, Dublin City University, Glasnevin, Dublin 9, Ireland **Email: Liam.sweeney23@mail.dcu.ie**
**If you have concerns about this study and wish to contact an independent person, please contact: The Secretary, Dublin City University Research Ethics Committee, c/o Research and Innovation Support, Dublin City University, Dublin 9. Tel 01-7008000, e-mail** rec@dcu.ie

**Appendix I. Plain Language Statement for Players – Chapter 8**



# <u>Plain Language Statement for players</u>

**What is this research about?**

The aim of this research is to examine how you feel about the experience of being a young footballer over the 2022 season. We would like to see how you feel about your football environment and the experience that you are getting.

**Here is some information about how the programme will work:**

· You will have a one-to-one interview with the lead researcher once a month to have a catch up on your football experiences and how you feel things are going. Topics might include how you feel about your coaching and what your training is like. This will take place online on zoom.

· This online interview will be password protected and only you, your parent/guardian and Liam Sweeney will have access to the password.

· Your parents will also be with you during all your interviews.

· We will record your interviews and analyse what you say.

· I will write up the transcripts from our interviews.

**What else do I need to know?**

· If you do not feel comfortable taking part in this research, we will stop immediately. You won't have to take part in this research after that.

·  I will write about the research in my university project, but I will never use your name.

·  I will keep all your interview transcripts in a password protected electronic file on a computer that no one else will have access to.

·  I will keep the information up until September 2024 at the latest. After that, I will safely delete the information.

**Who can I speak to if I have any questions?**

If you and/or your parent(s)/guardian(s) have any questions about this project, please contact the lead researcher:

**Name:** Liam Sweeney
**Work Address:** Albert College Building, The School of Health and Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland
**Email:** liam.sweeney23@mail.dcu.ie

**Or**

If you and/or your parent(s)/guardian(s) have concerns about this project and wish to contact an independent person, please contact:
The Secretary, Dublin City University Research Ethics Committee, c/o Research and Innovation Support, Dublin City University, Dublin 9. Tel 01-7008000, e-mail rec@dcu.ie

**Appendix J. Parental Consent Form – Chapter 8.**



# <u>Parental consent form</u>

Your child is invited and actively encouraged to take part in a research study titled
''Examining the talent development environment: The role of challenge''
The principal investigators for this research study are:

Mr Liam Sweeney, Ph.D. student at the School of Health and Human Performance, Faculty
of Science and Health, Glasnevin Campus, Dublin City University, Dublin 9, Ireland
Email: Liam.sweeney23@mail.dcu.ie

And

Dr Áine MacNamara, Associate Professor in Elite Performance, The School of Health and
Human Performance, Faculty of Science and Health, Glasnevin Campus, Dublin City
University, Dublin 9, Ireland
Email: Aine.macnamara@dcu.ie

**This research is funded by the Irish Research Council.**

<u>What is the purpose of this research?</u>
This research study aims to examine the experiences of navigating the "highs and lows" of
development through the lens of players. It is crucial to identify the challenges players
experience during their time within the national talent pathway and the impact that such
challenges have.

<u>What will my child do?</u>
Your child will be required to attend one in-person interview via zoom for a duration of
approximately 30-minutes on a monthly basis over the course of the season. These interviews

1

will take place between February and November 2022 with Liam Sweeney. As the parent/guardian of your child, you will also be required to be present for all online monthly interviews between the lead researcher and your child. Your child will discuss his experiences of player development and of his footballing environment each month. This interview will be between your child, yourself and the principal investigator only. All interviews will be recorded and transcribed. Please note that as interviews will be recorded on zoom, interviews will be audiotaped and videotaped as part of the interview process. You may turn your camera off from the video recording if you wish. You will be sent a private and password-protected zoom link via email at least one week prior to interview. On the date and time of the interview, you and your child may log into your personal zoom meeting. You will remain in the waiting room of your zoom meeting until the principal investigator (s) grants you access to the meeting room. Your interview will take place within the online meeting room.

<u>What additional security considerations will be put in place for my child's interview?</u>
• The meeting will be locked prior to the start of the interview to ensure that no one else may join
• The zoom meeting will be encrypted to ensure your privacy and anonymity is respected
• Unique meeting IDs are required for each scheduled meeting
• Interviews will take place between the principal investigator (s) and each participant only
• All meetings will take place using the DCU licenced version of zoom to comply with data protection requirements
• The video will be recorded but deleted immediately upon completion of the interview and only the audio will be retained. The audio will be deleted after transcription.

<u>Parents/guardian – please complete the following (Circle Yes or No for each question)</u>

I have read the Plain Language Statement (or had it read to me) Yes/No
I understand the information provided Yes/No
I understand the information provided in relation to data protection Yes/No
I have had an opportunity to ask questions and discuss this study Yes/No
I have received satisfactory answers to all my questions Yes/No
I accept that my child's interview will be recorded Yes/No

This study is completely confidential. Your child will be assigned a code number and will not be identified by name. You will be asked to return a signed consent form in pdf format via a google drive link. Your child will also be asked to provide their consent via an assent form. Consent forms will be secured in an encrypted electronic DCU file which is password protected. Only the principal investigator will have access to this password. Results from this study will be used by the principal investigators to write a report that may be published and presented publicly. All data will be presented anonymously, individuals will not be identified. Your child's information will not be processed for any other reason than for this study and it will not be transferred to any other country or organisation. Your child's personal data will be retained until after the PhD candidate Liam Sweeney has been examined and the degree awarded, to which it will then be permanently deleted. The upper retention limit for the storage

of this data is September 2024.It is important that you know that confidentiality of information can only be protected within the limitations of the law - i.e., it is possible for data to be subject to subpoena, freedom of information claim or mandated reporting by some professions. Your child's participation in this research is voluntary. They may withdraw from this study at any time without giving a reason. If they withdraw, any data identifiable to them will be deleted and information about their involvement will be discarded. If the data has already been anonymised and aggregated with other data, it will not be possible to identify and remove it, but it will not be possible to identify them from this aggregated data set. You can contact the researcher at liam.sweeney23@mail.dcu.ie if you have questions about this.

I have read and understood the information in this form. My questions and concerns have been answered by the researchers, and I have a copy of this consent form. Therefore, I consent for my child to take part in this research project.

Parents Signature:                              Parent name in Block Capitals:

Name of child:                                  Witness:

Date:

**Appendix K. Player Assent Form – Chapter 8.**



# <u>Player Assent Form</u>

• I have had the details of this research project explained to me.

• I understand that I will be interviewed once a month about my perceptions, experiences and the challenges I face as a young footballer in Ireland.

• I understand that these interviews will be recorded and analysed.

• I understand that these interviews will take place online with Liam Sweeney and that my parent will be present for all interviews.

• I know that I can withdraw from this research project at any time if I want to.

• I am happy to speak to a member of this research team if I have any questions or concerns.

**I agree to take part in this interview study for the 2022 season.**

Name:

Witness:

Date:

**Appendix L. Semi structured interview guide – Chapter 8**

- **<u>Key starting points – Reflexive journal and analysis</u>**

- Reflexive journal notes – key themes from previous interview

- Key themes from other previous interviews – cross check

- Overarching themes and subthemes from analysis to date

| Key question | Probe | Prompt | Rationale |
|---|---|---|---|
| What did you work on in the ETP/national academy over the last month? | What do the coaches want from you?<br><br>And what have you been working on back at your club? | Have the coaches at your club been working on different things to the coaches in the ETP and national academy? | Identify whether the coaching content is coherent across contexts and the challenges this presents |
| | Are the coaches coaching you in the same way?<br><br>What about the coaches in your other environments (school/club/ETP/regional/National Academy?) | Does this become confusing or difficult to know what to do? How/why? – so what do you do? | |

| What have you found challenging over the last month in football? | Why was this challenging?

When you come into the National Academy, do you find the training/matches more challenging than your club? How? Why?

What about the challenge in your other environments? School, club, ETP? Regional?

Have you found anything challenging outside of football? | Are you finding the training/matches challenging at your club?

How is the challenge different between your club and the National Academy? What about other levels?

How does this make you feel?

Who was supporting you during this challenge?

Physical workloads/burnout/lack of recovery – too much training? – school/club/ETP/National Academy/ other age groups as well? – do the | Identify the self-perceived biggest challenges over the previous month in a football context |
|---|---|---|---|

| | | coaches communicate together to manage this?<br><br>What about other sports as well? | |
|---|---|---|---|
| What were the most challenging/hardest things you found in the ETP/National Academy over the last month? | How did you react to these challenges?<br><br>What did you learn from these challenges?<br><br>How did the challenges make you feel? How did you reflect on them?<br><br>Selection?<br><br>Assessments and trials? | Will you respond differently next time?<br><br>How does this make you feel?<br><br>Who was supporting you during this challenge? | Identify the biggest challenges faced in a National Academy-specific context and how these challenges are responded to |

| | | | |
|---|---|---|---|
| | Is there anything that you didn't enjoy at the national academy this month? | | |
| Are there any other challenges you've faced over the last month that you think have influenced your development? | Is there anything outside of football that you're finding challenging as a young footballer?<br><br>What would you say was your biggest developmental challenge this month?<br><br>How does this make you feel?<br><br>Who was supporting you during this challenge? | What about school?<br><br>What about your social life and seeing friends?<br><br>Travel and time commitment? | Identify any other challenges/non-sporting challenges perceived as significant |

## Appendix M. Letter of Ethical Approval – Chapter 4

Dr. Aine MacNamara
School of Health and Human Performance

Mr. Liam Sweeney
School of Health and Human Performance

18th January 2021

**REC Reference:**   **DCUREC/2020/276**

**Proposal Title:**   **Stakeholder Perspectives of The Implementation of a National Academy and League Structure in Underage Irish Football**

**Applicant(s):**   **Dr. Aine MacNamara and Mr. Liam Sweeney**

Dear Colleagues,

This research proposal qualifies under our Notification Procedure, as a low risk social research project.   Therefore, the DCU Research Ethics Committee approves this project.

Materials used to recruit participants should state that ethical approval for this project has been obtained from the Dublin City University Research Ethics Committee.

Should substantial modifications to the research protocol be required at a later stage, a further amendment submission should be made to the REC.

Yours sincerely,

*Geraldine Scanlon*

**Dr Geraldine Scanlon**
Chairperson
DCU Research Ethics Committee

DCU
**Research & Innovation**

**Appendix N. Letter of Ethical Approval – Chapter 5 and 6**

Ollscoil Chathair Bhaile Átha Cliath
**Dublin City University**

Mr Liam Sweeney
School of Health and Human Performance

Dr Áine MacNamara
School of Health and Human Performance

18th January 2022

**REC Reference:**    **DCUREC/2021/261**

**Proposal Title:**    **Examining biological maturation in the Football Association of Ireland National Academy**

**Applicant(s):**    **Mr Liam Sweeney and Dr Áine MacNamara**

Dear Colleagues,

Thank you for your application to DCU Research Ethics Committee (REC). Further to expedited review, DCU REC are pleased to issue approval for this research proposal.

DCU REC's consideration of all ethics applications are dependent upon the information supplied by the researcher. This information is expected to be truthful and accurate. Researchers are responsible for ensuring that their research is carried out in accordance with the information provided in their ethics application.

Materials used to recruit participants should note that ethical approval for this project has been obtained from the Dublin City University Research Ethics Committee. Should substantial modifications to the research protocol be required at a later stage, a further amendment submission should be made to the REC.

Yours sincerely,

**Dr. Melrona Kirrane**
Chairperson
DCU Research Ethics Committee

# Appendix O. Letter of Ethical Approval – Chapter 8

**Ollscoil Chathair Bhaile Átha Cliath**
**Dublin City University**

Mr. Liam Sweeney
School of Health and Human Performance

Dr Áine MacNamara
School of Health and Human Performance

17th February 2022

**REC Reference:**      **DCUREC/2022/021**

**Proposal Title:**      **Examining the talent development environment: The role of challenge.**

**Applicant(s):**      **Mr. Liam Sweeney and Dr Áine MacNamara**

Dear Colleagues,

Thank you for your application to DCU Research Ethics Committee (REC). Further to expedited review, DCU REC are pleased to issue approval for this research proposal.

DCU REC's consideration of all ethics applications are dependent upon the information supplied by the researcher. This information is expected to be truthful and accurate. Researchers are responsible for ensuring that their research is carried out in accordance with the information provided in their ethics application.

Materials used to recruit participants should note that ethical approval for this project has been obtained from the Dublin City University Research Ethics Committee. Should substantial modifications to the research protocol be required at a later stage, a further amendment submission should be made to the REC.

Yours sincerely,

**Dr. Melrona Kirrane**
Chairperson
DCU Research Ethics Committee

**Taighde & Nuálaíocht Tacaíocht**
Ollscoil Chathair Bhaile Átha Cliath,
Baile Átha Cliath, Éire

**Research & Innovation Support**
Dublin City University,
Dublin 9, Ireland

T +353 1 700 8000
F +353 1 700 8002
E research@dcu.ie
www.dcu.ie

1