Early developmental environment and Olympic success: an analysis of an Australian sporting "hotspot"

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Doctor of Philosophy

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Faculty of Arts and Social Sciences
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Author’s Declaration

This is to certify that:

I. This thesis comprises only my original work towards the Doctor of Philosophy Degree.
II. Due acknowledgement has been made in the text to all other material used.
III. The thesis does not exceed the word length for this degree.
IV. No part of this work has been used for the award of another degree.
V. This thesis meets the University of Sydney’s Human Research Ethics Committee (HREC) requirements for the conduct of research.

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Date: 6th February 2018
Abstract

Inspired by the ‘birthplace effect’ phenomenon, this study aimed to identify an Australian sporting “hotspot” and gain an understanding of factors underpinning a proportionately high number of Australian summer Olympians experiencing their early developmental environment within the area. A mixed-methods approach was utilised to identify the “hotspot” through collecting biographical data on all known (n=2160) Australian summer Olympians 1984-2012, followed by undertaking a case study analysis to examine the “hotspot” within the context of Bronfenbrenner’s (1979b; 1994a; 1998) ‘Ecological Systems Theory’ and ‘Bioecological Model’. Alongside the archival collection of demographic and climate data, Olympians’ (n=11) and community stakeholders (n=31) views regarding the “hotspot’s” occurrence and its perceived influence on athletic development were gained through semi-structured interviews. The results determined several demographic, geographic, historical, individual, social and fortuitous factors contributed to the creation of the “hotspot”. Access to built and natural facilities, climate, family influence, schools, strong community clubs, opportunity to train and compete with older athletes, access to role models, high socioeconomic status and an endemic sports culture were key contributors to effective athlete development within the “hotspot”. Although not predominantly attributable to one variable, it was evident a confluence of planned and fortuitous factors had unintentionally created a “hotspot” of Australian summer Olympians in Perth, Western Australia. Despite several factors being unique to the “hotspot”, some are potentially transferable to other athlete development environments in Australia and overseas. In a quality early developmental environment, Olympians believed factors proximal to them including family, the junior sports environment and individual psychological characteristics had the most decisive influence on their athletic development.
Preface

Prior to undertaking this PhD, I had a lifelong interest in the Olympic Games and the biographical histories of Australian sporting greats. Although I did not hold existing personal or professional engagements with Australian Olympians, the journey I have been on in completing this thesis has enabled me to immerse myself in the fascinating world of athlete development and the processes that occur at a community level to support trajectories into elite sporting pathways. Completing this PhD has been a rewarding journey, which has enabled me to develop a broad range of skills and experiences relating to this study alongside concurrent research outputs. The following awards, grants, publications, conference presentations and media experience represent some examples of what I have achieved throughout my PhD candidature.

Awards and grants

- Young Investigators Award – Oral Presentation (2nd place), 22nd annual Congress of the European College of Sport Science (ECSS), Essen, Germany (2017)
- International Olympic Committee (IOC) PhD Students Research Grant Programme 2015 recipient
- Young Investigator Award - Best Oral Presentation ICSEMIS conference, Glasgow, Scotland (2012)
- Australian Postgraduate Award (APA) (2012-2015)
- Postgraduate Research Support Scheme (PRSS) recipient (2012, 2013, 2014)

Publications


Invited speaker


Conference presentations


Media

This study attracted media interest in Perth during data collection and nationally prior to the Rio 2016 Olympic Games. During these periods I engaged in sharing my research with the public, which resulted in several online and print media outputs alongside live radio interviews. Some of these outputs were through prominent Australian media sources including the *Sydney Morning Herald*, *The Age*, *Business Insider Australia*, ABC Radio National and a page 1 story in *The Weekend West*. A complete overview of media outputs relating to this study can be found in Appendix A.
List of Acronyms

ABS – Australian Bureau of Statistics
ACT – Australian Capital Territory
AIS - Australian Institute of Sport
AFL – Australian Football
BM – Bioecological Model
BOM – Bureau of Meteorology
BPE – Birthplace effect
EDE – Early Developmental Environment
EST – Ecological Systems Theory
FMS – Fundamental Movement Skills
IOC – International Olympic Committee
MM – Mixed Methods
MVPA – Moderate-Vigorous Physical Activity
NSW – New South Wales
NSWIS – New South Wales Institute of Sport
NT – Northern Territory
PA – Physical Activity
PE – Physical Education
QLD - Queensland
SA – South Australia
SES – Socioeconomic Status
SA – South Australia
TAS - Tasmania
UWA - University of Western Australia
VIC - Victoria
WA – Western Australia
WAIS – Western Australian Institute of Sport
Operational Definitions

*Birthplace effect* – refers to the potential for an elite athlete’s birthplace or early developmental environment to either enhance or deter the chances of an individual athlete being ‘successful’ in sport (Bruner, MacDonald, Pickett, & Côté, 2011).

*Birthplace* – this term will be used as a proxy in this study for identifying the environment where an athlete spent their early athletic development years, particularly the location of their schooling, junior sports club and area in which they were known to have grown up in, whilst not necessarily being the place in which they were born.

*Community* – a term used to encompass a specific type of community within a Local Government Area (LGA), such as a sporting or school community. This includes intangibles such as the bonds and interrelationships shared amongst members of these groups.

*Early developmental environment* – term used within this study which refers to the geographical location where an Olympian spent their formative years based on their birthplace, schooling and/or junior sports club location, during their sampling (6-13) and specialising (13-15) years (Côté, 1999).

*Hotspot* – An environment or community in which a particular type of talent or expertise has been consistently produced and maintained at a high level of achievement. Within the context of this study, a “hotspot” refers to an Australian geographic area (based on LGAs), which has produced a greater proportionate number of summer Olympic representatives 1984-2012 relative to population size, whilst also considering the consistency of the performance of these athletes at the summer Olympic Games [Adapted from Coyle (2009): definition of “talent hotbed”].

*Local Government Area (LGA)* - refers to a geographical area under the responsibility of an incorporated local government council or an incorporated Indigenous government council. Collectively, LGA’s cover most parts of Australia apart from areas of northern South Australia, much of the Northern Territory, the western division of New South Wales and all of the Australian Capital Territory. Types of LGA’s in Australia include: Cities, Rural cities, Areas, Boroughs, Shires, Towns, Regional Councils, Municipalities, District Councils and Aboriginal Councils (Australian Bureau of Statistics, 2011a).
Acknowledgements

This thesis would not have been possible without the guidance, support and generosity of the people who have played a key role in my PhD journey.

First and foremost, I owe my sincerest thanks to my supervisor Dr Wayne Cotton. Thank you for your unwavering support - not just throughout this PhD journey but in the last eight years since you first recruited me into research by chance, changing both my life and career path. I have learned so much from you, whether it has been enhancing my technological and statistical aptitude (in which I was lacking), understanding patience with process, the level of artistic flair required to select my top 5000 landscape/travel photos and immeasurably more – thank you for teaching me.

I am also very appreciative of the ongoing guidance and support of my co-supervisor Associate Professor Donna O’Connor. Your tough-love approach to my writing and thesis overall ensured that it turned out the best it could possibly be – I am very grateful for your support and time, both of which you were always willing to provide. You have been a key part of my journey and I couldn’t have done it without you.

I would also like to extend my appreciation to the broader Faculty of Education and Social Work academic community, who have provided me with opportunities to develop both professionally and as a researcher. The courses and workshops provided throughout my PhD candidature around qualitative and quantitative research methods, publication and software has enabled me to develop confidence in my abilities as an early career researcher in a dynamic world. I also owe immense thanks to Dr Louisa Peralta, Ms. Nicole Hart and Ms. Thea Werkhoven who have provided me with opportunities to co-teach across the areas of physical education, health and nutrition. I will forever be grateful for the generosity of time provided to answer any questions or queries encountered during my first few years of university teaching – I have learnt more than you will ever know.

The financial assistance provided to me by the University of Sydney through the Australian Postgraduate Award (APA) (2012-2015) and Postgraduate Research Support Scheme (PRSS) (2012-2014) has also been invaluable. This greatly assisted with living expenses and travel costs associated with my research, enabling me to present at conferences and further my data collection. More broadly, the unexpected funding provided by the ICSEMIS 2012 Early Career Researchers Award (Best Oral Presentation) and especially the International Olympic Committee (IOC) PhD Students Research Grant Programme 2015 has provided me with opportunities to further my research career. To be the recipient of an IOC...
research grant has been a humbling experience and without this my travel to Perth and Melbourne to interview retired “hotspot” Olympians would not have been possible. I will forever be grateful for the wonderful memories and opportunities this grant has brought me.

Finding the “hotspot” would not have been possible without access to a plethora of electronic and print resources covering Australian sports history. The foundation stages of data collection would have been immeasurably more challenging without the assistance of Greg Blood and library staff at the National Sport Information Centre (NSIC) in Canberra. Greg, your knowledge of Australian sports history is immense and I honestly don’t think I could have found the early developmental environment of so many Australian Olympians without your well-organised collection of archival and print media. I appreciate the remaining library staff who allowed me to feel at home during my stay and your patience when I kept books, folders and newspaper clippings out on desks for days at a time. Discussing my ideas with Dr. Juanita Weissensteiner during my trip to the Australian Institute of Sport (AIS) encouraged me to look at my growing project from different perspectives and enabled me to feel confident in its potential contribution to Australian athlete development research.

Following this, my investigations in Perth would never have eventuated without the broader Cambridge, Claremont and Nedlands sporting communities and “hotspot” Olympians. Your friendliness and warmth to an ‘outsider’ from Sydney exceeded expectations – I am so thankful for the open welcome into your homes, workplaces and willingness to share a coffee with me at your favourite café whilst allowing me into your lives and views of the “hotspot”. Meeting you has been a true privilege for which I will be forever indebted; I could never thank you enough for your time or generosity. Without you, this study truly would not have been possible and my experiences in Perth were genuinely the highlight of this PhD journey.

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Chapter 1 – Introduction

1.1 Research subject and objectives

Sport can be described as a universal language which endows people with a focus for their energy, worthwhile goals and a forum to learn essential life lessons such as hard work, discipline, victory and defeat (United Nations, 2005). An expression of this notion is epitomised through the Olympic Games; the world’s largest peace-time event which is of cultural, social, economic and political significance globally (Toohey & Veal, 2007). Australia has taken great pride in its unbroken record of attendance at the modern Olympic Games since its birth in 1896; a significant achievement for a nation characterised by isolation from much of the remainder of the world (Gordon, 2008).

The Olympic Games and sport in general, bring together the global community, as well as smaller communities within a national context. In many Australian communities, sport is viewed as the ‘glue’ which holds them together and is particularly evident in smaller localities and rural areas (Rural and Regional Services and Development Committee, 2004). Competitive sport has been found to play a key role within communities’ social, cultural, political and economic relations (Tonts, 2005), with sports clubs providing centres for local communities to build their identity and community pride (Stoddart, 1988; Townsend, Moore, & Mahoney, 2002). It is evident that in Australia, sport can be influential for the nation as a whole, and for broader communities and the individuals residing in them.

Despite the high profile of sport in Australia, little academic research has been conducted which focuses on individual Australian communities, their relationship with the Olympic Games and how the environment they create can influence elite athletic development. This study began with an interest to learn more about factors influencing the development of Olympic athletes, and why some regions of Australia appear to be more successful in producing Olympians than others. In recent years, there has been emerging knowledge that it is not merely a coincidence many of Australia’s sporting elite, whether Olympians or professional sports people, originate from the same communities or geographical regions. ‘High talent yield’ regions have previously been found in sporting populations dominant in Australia, including cricket and Australian Football (AFL) (Toohey et al., 2015; Woolcock & Burke, 2013) and around the world as evidenced by the “birthplace effect”; the concept that ‘where’ an athlete is born and spends their early developmental years can significantly influence athletic success (Côté, MacDonald, Baker, & Abernethy, 2006). Consequently, there is growing understanding that such occurrences may be directly
influenced by interrelationships between several psychosocial factors present within an athlete’s early developmental environment (EDE) and the geographic location they are exposed to in their formative years.

This study sought to identify a “hotspot” of Australian summer Olympians and gain an understanding of factors underpinning a proportionately high number of Australian summer Olympic representatives (1984-2012) experiencing their early athletic development in this environment. Within the context of Bronfenbrenner’s ‘Ecological Systems Theory’ (EST) (1979b) and ‘Bioecological Model’ (BM) (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998), this study used a mixed-methods approach to undertake a holistic exploration of the identified “hotspot” and the EDE it provided to Olympians’ during their attainment of expertise. Given that learning about effective athlete development environments involves more than just talking to the Olympians themselves, it was also necessary to draw upon the perspectives of the broader community. Doing so aimed to relate community perceptions with Olympians’ lived experiences, in order to determine the series of events or influences that were most likely to have had a positive effect on athletic development within the “hotspot” environment.

The key aims of this study were to

1. Identify if and where a “hotspot” of 1984-2012 Australian summer Olympians existed, and place it in an Australian context; and

2. Investigate the influence of the “hotspot” on Olympians who experienced their early athletic development in this environment, as perceived by the Olympians themselves and the “hotspot” community.

These aims were addressed over the course of two studies, which will be presented separately.

1. Identifying and situating the “hotspot” in an Australian context (Study 1)

2. Olympians’ and community perceptions of the “hotspot” (Study 2)
In addressing the aims, the two individual studies sought to answer the following three research questions:

1. *Which Australian Local Government Areas (LGAs) comprise a “hotspot” area for 1984-2012 Australian summer Olympic representatives and how does the “hotspot” compare demographically and climatically to other Australian areas?* (Study 1);

2. *What are the community’s perceptions of how the “hotspot” was created and how influential do they think this early developmental environment was to the subsequent sporting success of local Olympians?* (Study 2); and

3. *How do Australian Olympians retrospectively perceive the influence of the “hotspot” and its contribution to their early athletic development and subsequent sporting success?* (Study 2).

**1.2 Significance of the study**

**1.2.1 Academic significance of the study**

In the field of athlete development, research on the attainment of athletic expertise have explored several factors including coaching, genetics, practice, family influence, relative age effect and birthplace effect. Birthplace effect particularly has been observed across multiple countries and sports in recent years, with prior studies providing evidence for the birthplace effect regarding sports performance, participation and dropout outcomes (Baker & Logan, 2007; Balish, Rainham & Blanchard, 2015; Côté et al., 2006; Imtiaz, Hancock, Vierimaa & Côté, 2014; MacDonald, Cheung, Côté & Abernethy, 2009). Studies have frequently reported certain size communities are conducive to athlete development, with many elite athletes known to have come from communities that would be classified as ‘small-medium’. In other countries, such as the United States and Canada, where several of these studies have taken place, this ideal community size is deemed to be ≤ 500, 000, but particularly ≤ 250, 000 inhabitants (Côté et al., 2006; MacDonald, Cheung, Côté, & Abernethy, 2009).

Although these prior studies have identified successful regions across different sports (Baker, Shuiskiy, & Schorer, 2014; Carlson, 1988; Côté et al., 2006; Lidor, Arnon, Maayan, Gershon, & Côté, 2014), little published work to date has directly examined individual, demographic, contextual and environmental factors contributing to these outcomes particularly amongst Australian Olympians. Despite a broad range of hypotheses being suggested for the occurrence of birthplace effects, most prior studies have been quantitative in nature which may limit open and deep exploration of some of these theories.
Comparatively, this study sought to explore the phenomenon of birthplace effect through a mixed-methods approach, with greater emphasis on qualitative aspects which seek to directly investigate some of the factors pertaining to the aforementioned hypotheses through enhanced participant voice.

The purpose of doing so was to determine if similar birthplace effect-type trends exist in Australia amongst a cohort of 1984-2012 summer Olympians across a full range of sports in the Games program. Further, it sought to examine and gain understanding of the fundamental characteristics associated with certain geographical community sizes and expertise development amongst Australian communities that have produced several Olympic athletes. The chosen period encompasses Australia’s presence at all summer Olympic Games following the 1981 inception of the Australian Institute of Sport (AIS); the nation’s first sporting institute. Given Australia’s significantly smaller population compared to several nations in prior birthplace effect studies, it was unknown what type of geographic location or population size would be associated with a talent “hotspot” of Australian Olympians, should one occur.

Using the 2016 Census as the most recent example, Australia had a population of 23.4 million which is more than double the nation’s population just 50 years ago. In large part, this growing population is due to high patterns of migration to Australia over the last few centuries whereby more than one-quarter (26%) of the population is born overseas and contributes to the nation’s rich multi-cultural heritage (Australian Bureau of Statistics, 2017). In the equivalent year, Australia was comparatively much smaller than the United States (323,127,513 million) and Canada (35,151,728 million) which has provided the context for many prior birthplace effect-type studies (Statistics Canada, 2017; United States Census Bureau, 2017). Furthermore, majority (80%) of Australia’s residents live in the nation’s Eastern mainland states (New South Wales, Victoria, Queensland and the Australian Capital Territory) with two-thirds of all Australians living in a capital city (Australian Bureau of Statistics, 2017). Collectively, these population and geographic residential factors are just some variables which may create difference in where an Australian “hotspot” may occur compared to prior studies.

Additionally, relatively few studies have utilised concepts underpinning Bronfenbrenner’s theories of human development as a framework when investigating the relationship between environment and athlete development (Balish, 2011; Carlson, 1988; Cobley, Hanratty, O’Connor, & Cotton, 2014; Henriksen, 2010; Larsen, Alfermann, Henriksen, & Christensen, 2013). Specifically, none of them have conducted a retrospective investigation of Olympic athletes and their EDE. Bronfenbrenner’s ‘Ecological Systems
Theory’ (1979b) and ‘Bioecological Model’ (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998) were chosen as the guiding theoretical frameworks for this study, as they allow for investigation of a range of individual and environmental factors, which may influence athletic development at varying levels of proximity to the individual. Taking this approach has the potential to build upon earlier birthplace and expertise development research by qualitatively investigating these systems from a contemporary, Australian perspective.

1.2.2 Practical significance of the study

Apart from making possible contributions to the existing academic literature, this research holds potential interest for the broader international sporting community. The development of Olympic athletes is multi-dimensional and is contributable to a range of individual and peripheral factors. These factors work in synchrony to determine an athlete’s success in sport, with interactions between an individual’s heritable characteristics and surrounding environment thought to be primary determining influences (Baker & Horton, 2004). Peripheral factors can include the context of an athlete’s broader developmental environment and the role of the athlete’s entourage. An athlete’s entourage comprises all individuals who associate with and promote their sporting career (International Olympic Committee, 2015a). Within this study, key members of the entourage include but are not limited to family, coaches, peers, sports clubs, schools and the wider community in which Olympians’ athletic development took place. Investigating the way in which the entourage interacted with a cohort of Olympians over the course of their development is important for a number of reasons. Doll-Tepper (2012) suggests the supportive environment that an entourage provides can underpin a healthy and successful sporting career. Depending on their influence, significant others can provide a source of encouragement and motivation or alternatively discourage Olympians over the course of their career.

The 2015 IOC consensus statement on youth athletic development acknowledged athlete development is multidimensional and difficult to assess, given the variance in the trajectories from grassroots to elite level (Bergeron et al., 2015). These challenges are further reinforced by the interactions between country, culture and context and the complexities this can create in accurate talent identification. Using an Australian “hotspot” as an example, exploration of the roles entourage and broader environment have on an Olympian’s athletic development, may highlight some of the modifiable and non-modifiable features that may be present within the early developmental environment contexts of other non-Australian summer Olympians.
Accordingly, the outcomes of this study may serve to contribute further knowledge and inform practice surrounding positive athlete developmental experiences at the grassroots level and promote avenues to new measures of talent identification. Potentially, this will inform the Olympic Movement and talent identification community about the key developmental experiences shared by a cohort of Olympians, who originated from a successful, high performance environment that has been sustained over an extended period of time. Ultimately, contextual factors will determine if some of the variables which positively influenced the athletic development of “hotspot” Olympians, are transferable to other settings in Australia and beyond.

1.3 Thesis outline

This thesis comprises seven chapters. This first chapter provided the background, objectives and research significance of this project. Chapter 2 provides an empirical grounding for the study by critically reviewing literature on the role of sport in Australian society and a host of factors understood to influence athlete development and the attainment of expertise. Chapter 3 details the chosen theoretical framework guiding this research, including an extended explanation of Bronfenbrenner’s ‘Ecological Systems Theory’ (1979b) and ‘Bioecological Model’ (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998) and their practical application within this study. The data collection procedures, analytical techniques, ethical issues and the establishment of trustworthiness used to guide the project, are outlined in Chapter 4. Results and discussion of each stage of the research will take place in chronological order. Chapter 5 presents the results and discussion of Study 1, that is, identification of a “hotspot” of 1984-2012 Australian summer Olympians and investigation of how the “hotspot” compares to an Australian context across several demographic and climatic factors. Chapter 6 answers the second research question and aims to triangulate the results presented in the previous chapter through analysis of Olympians’ and community perceptions of the “hotspot” and how it was created. Through the lens of Bronfenbrenner’s ‘Ecological Systems Theory’ (1979b), Chapter 6 also describes the “hotspot’s” influence on Olympians whose early athletic development took place within this environment, and how it may have contributed to their subsequent sporting success. Chapter 6’s presentation of Olympians’ perceptions of the “hotspot” formed the basis of a report submitted in fulfilment of a grant from the International Olympic Committee (IOC) Studies Centre (2015). Finally, Chapter 7 provides a combined critical analysis and discussion of results from Studies 1 and 2 within the framework of the ‘Bioecological Model’ (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998). This is followed by a summary of conclusions, the limitations and practical applications of this study alongside recommendations for future research.
1.4 Conclusion

Chapter 1 has provided a broad overview of the thesis subject and objectives, as well as the key aims and research questions to be addressed across Study 1 and 2. Additionally, the chapter sought to identify the potential academic and practical value of undertaking this study in an Australian context, for both academic and broader sporting communities. This discussion took place in light of existing academic literature, in addition to making reference to Bronfenbrenner’s EST and BM of human development which will form the guiding frameworks for this study. Finally, a synopsis of the thesis by chapter was provided, with a clear outline indicating the direction of the thesis across the following six chapters.
Chapter 2 - Literature Review

2.1 Introduction

This chapter provides an empirical grounding for the study by critically reviewing academic literature, which examines the role of sport and the Olympics in Australian post-settlement history, culture and identity. The Australian lifestyle, national pride and ongoing costs associated with maintaining the nation’s illustrious summer Olympic history, will also be explored. The latter stages of this chapter will critically analyse several individual and environmental factors known to influence athletic development. Providing these foundations aims to contextualise this project and highlight themes to be further investigated in this study.

2.2 The role of sport in Australia’s modern history

2.2.1 Australian nationalism and sporting identity – a historical overview

Throughout Australia’s modern history, sport has been perceived as playing an integral role in Australian society through shaping the nation’s identity, ethos and sense of community as a whole (Ferguson, 2006; Stoddart, 1988). Since early settlement, Australia has been regarded as a paradise of sport with several economic, political, social and cultural factors contributing to its elevated status (Cashman, 1995). Beyond enhancing physical fitness, sport was traditionally viewed as an effective means of building character traits including nationalistic pride, team spirit, sportsmanship, duty and discipline (Cashman, 1995; Vamplew, Moore, O’Hara, Cashman, & Jobling, 1997).

Although Australia’s attitude towards individuals and groups participating in sport has changed significantly over the last two centuries, passion for sport has continued unabated for many. Accordingly, some have classified sport as a national ‘world-view’, ‘religion’ or ‘obsession’ (Cashman, 1995; Land & Butner, 1982; Phillips & Magdalinski, 2003; Stoddart, 1986; Stratton, 1986; The Australian Society for Sports History, 1987). These stereotypes have arisen from sporting heroes being revered by politicians, media and the general public (Phillips & Magdalinski, 2003). Furthermore, active participation in and spectator attendance figures at sporting events (Ward, 2010), international sporting success relative to a small national population (Phillips & Magdalinski, 2003) and an ‘outdoors culture’ with climate often conducive to physical activity (PA) (Caldwell, 1972; Ward, 2010), have all contributed to this image of sport in Australia.
As in any diverse society, it is inevitable there will be 'cultural critics' (Cashman, 2002) who may accuse Australia’s international reputation of sporting ‘obsession’ as being dominant to other cultural activities such as the arts (Stoddart, 1986; Tatz, 1986) or even exclusionary for individuals who may feel marginalised by Australia’s sporting norms. These assumptions are supported by prior research, which has found a large cohort of Australians value sport more highly than other areas of international achievement including science, technology, literature and the arts (Ferguson, 2006; Kell, 2000). Headon (2001) suggests rather than being separate entities, ‘low’ culture such as sport and ‘high’ culture like the arts are, in fact, intertwined to create a rich and meaningful national culture. Numerous artists, novelists, poets, dramatists and musicians have drawn inspiration from Australia’s rich sporting culture and have enhanced the mythology surrounding sport and national identity (Cashman, 2011b). Although perceptions of it benefits may not be uniformly shared across the Australian population, Cashman (2002) purports that sport in post-settlement Australia has historically been how many citizens view the world in terms of ritual, humour, community, sense of place and notions of the body.

When considering Australia’s diverse and successful sporting history, it must be speculated why this global cultural activity and phenomenon is especially pertinent to Australian society. Although not the only country to express an avid interest in sport, Australia has an international reputation for all-round sports passion. Unlike countries who have a passion for one or two national sports, including American Football and Baseball in the United States, Football in South America, Ice Hockey in Canada or Rugby Union in New Zealand (Dunstan, 1973; Stoddart, 1986), Australia’s sporting landscape and success has been historically diverse. This is emphasised through Georgakis and Russell’s (2011) reflection that Australia is the only country worldwide where four football codes (Football, Rugby Union, Rugby League and Australian Rules) compete for dominance. In addition, the nation’s highest annual award, ‘Australian of the Year’ has been won by the nation’s best sporting men and women on several occasions (Kell, 2000).

Several geographical, historical and sociological factors may be attributable to Australia’s fascination with, and success at, sport (Jacques & Pavia, 1976). Simple explanations allude to Australia’s sun and surf climate, fresh air and active lifestyle leading to abundant blessings of natural talent (Gordon, 2014). Comparatively, it has been argued that although countries including Spain, Italy, Mexico and South Africa experience similar climates, they are not overwhelmed by Australian-like widespread ‘sport mania’ or international triumphs (Dunstan, 1976; Gordon, 1976). Traditional views suggest Australia’s penal history led to an ‘inferiority complex’, whereby the nation’s people were driven by a chip on their shoulder to take on the world and win (Gordon, 1976; Jones & Johnstone,
Despite coinciding with undesirable chapters of Australia’s history, this colonial society brought potential benefits.

Australia’s early settlers came from Britain, the world’s most sports-conscious nation at that time (Dunstan, 1973) and from the beginning of Australia’s post-settlement history, physical prowess was valued due to its contributions to a progressive pioneering society (Ferguson, 2006). Daly (1972) concurs a distinctive ‘Australian type’ developed during the nineteenth-century, which influenced early social attitudes of the colony. Mystique surrounding the Australian pioneer was built upon ideals of being tough, masculine, tenacious, resourceful and independent; all valuable characteristics of a successful athlete. This mentality was reinforced by a male-dominant society in which it was essential to be reliant upon others for companionship, amusement and mateship in times of colonial hardship; similar to requirements for success in team sports (Dunstan, 1976). Accordingly, Australia’s relatively short modern history, isolated geography and migrant breeding, may all be partially responsible for Australia’s ‘will to win’, and its aggressive desire to reach self-imposed sporting goals (Gordon, 1976).

Although not solely attributable to Australia’s sporting success, climate must also be considered a key element contributing to national sporting culture and success. Across many Australian regions, year-round climatic conditions are conducive for several types of sport, especially along the coastal fringes where the majority of Australians reside (Embrey, 2000; Waters, 1976). This climate is accompanied by ease of access to several natural and man-made recreational facilities: waterways and beaches are considered world-class; parklands are plentiful; and council facilities are widely available, with most towns providing access to public swimming pools and facilities for tennis and golf, which are usually reserved for the affluent in other countries (Australian News and Information Bureau, 1976; Mossop, 1989; Waters, 1976). In turn, greater opportunity and encouragement to participate in several sports, relative to other countries, may be another contributing factor to Australia’s international sporting success (Waters, 1976).

The concept that ease of access to facilities in Australia can promote enhanced involvement in PA and sport has been made evident through the life histories of several prominent Australian athletes. John Konrads and John Landy are two examples of Olympians who become involved in their eventual Olympic sport through convenience; each of them lived close to a local swimming pool and running track respectively (Gordon, 1976). Ease of access to sporting opportunities is also beneficial at the grassroots level, with schools often responsible for children’s initial introduction to PA and sport. State-based education systems, combined with swimming associations, have taught many Australians to
swim during school time or summer vacation (Embrey, 2000). Traditionally, other types of school sport have also been compulsory in Australia. This is seen more often in independent and denominational schools compared to government schools, which often lack money and facilities (Dunstan, 1973). Regardless of the schools they attend, more than half (60%) of Australian children aged 5-14 years, are known to participate in organised sport outside of school hours (Australian Bureau of Statistics, 2013d). Despite these encouraging statistics, it is still important to consider that such participation may not always be regular or given adequate time to result in health benefits.

In light of overall junior participation numbers in sport however, there is still potential for encouragement to be involved in sport from a young age to influence both grassroots sports participation and success at an elite level. Traditionally in modern Australia, sport has idealistically been considered as a ‘great leveller’ (Kell, 2000) due to its perceived ability and potential to promote unity regardless of class, occupation and wealth differences. The introduction of the five-and-a-half-day working week in the early 20th century, before many other parts of the world, catalysed opportunities for a variety of Australians to become involved in watching or playing sport, resulting in sport becoming a distinctive feature of national culture in a time when only the privileged elite of other countries had sufficient time to engage in leisure.

It is important to consider however, that taking a universal approach to the purported benefits of the Australian sports scene can be limiting. This is due to race, gender or other forms of diversity beyond the norm holding potential to hinder maximal engagement in the Australian sports scene by some individuals and groups (Block & Gibbs, 2017; Foley et al., 2011; Tatz, 2011; Waterhouse, 1995). Effectively managing diversity in sport is not solely a historical issue, but one that Australian community sports clubs continue to struggle with even in the twenty-first century (Spaaij et al., 2014). Although, Australia’s overall sporting culture and early changes in working trends have historically provided advantages over larger nations who did not share similar industrial conditions. Subsequent victories in cricket, rugby and early modern Olympic Games generated a self-image and belief of Australia being ‘a nation of world beaters’ (Jenkinson, 1985). Consequently, sport became a ‘yardstick’ through which Australia took great pride in beating the ‘mother country’ England (Ferguson, 2006), as well as other dominant nations on a global stage at the summer Olympic Games; a source of national pride, which remains today.
2.2.2 Australia and the Olympic Games

Based on modern Australia’s rich sporting history, it is elite sport that has most strongly been attributed to providing many Australian’s with a sense of national identity (Drummond & Pill, 2011). This has been partly due to Australia’s strongest images on an international-scale arising from our athletes often being viewed as attractive, friendly and casual, and ties closely with Australia’s representation as a tourist destination, depicted through golden beaches, blue skies and vibrant people (Ferguson, 2006). Birrell (2001) suggests Australia’s relationship with the summer Olympics in particular has contributed to a sense of nationalism post-Federation (1901). Sport and the Olympics are now so deeply embedded in the Australian psyche, that Kell (2000) purports ‘the whole nation’ understands references to ‘the Games’, whilst Cashman (2002) suggests the Olympics produces a greater proportion of national sporting heroes and heroines than any one sport.

In this light, it is not surprising that Australia has had an unbroken record of attendance at the modern Olympic Games since their inception in 1896 (Gordon, 2008). This attendance has endured periods of political uncertainty, when other nations boycotted the Games (Kell, 2000) and during the Great Depression, when the Australian Olympic Federation was penniless (Gordon, 2008). This history has been both continuous and illustrious: high achievement at the Games has been noted since the first modern Olympiad, when Edwin Flack became Australia’s pioneering Olympian and two-time gold medallist. This was followed by the introduction of Australia’s first Olympic heroines, Fanny Durack and Wilhelmina Wylie in 1912, during an era when relatively few nations sent women to compete at the Games. Winning gold and silver respectively in swimming, Durack and Wylie highlighted a significant achievement for young women in the Edwardian era. Typically, training opportunities were limited or non-existent, given that female swimsuits were frowned upon and mixed bathing was still banned at several Australian beaches (Gordon, 1994, 2014).

Throughout the 20th century, many of Australia’s greatest Olympians became woven into the folklore of modern Australian history. Partially, this was due to recognition of these athletes as everyday Australians. Beyond the expected male athletic ‘heroes’, many who became household names originated as ‘battlers’ from the bush, the working class, had migrant backgrounds or were female. This is epitomised in anecdotes that elite sportswomen such as Shirley Strickland ran without shoes until age 12, whilst ‘the Lithgow Flash’, Marjorie Jackson, trained at night running towards car headlights in fog, sleet and sometimes even snow following her day job in the late-1940’s (Gordon, 2014). Dawn Fraser became well-known for her ‘larrikin spirit’ and humble beginnings in a ‘neighbourhood of battlers’, in the
same era that Latvian immigrants John and Ilsa Konrads, became world-record breaking siblings (Gordon, 2008).

The achievements of Australian Olympians during earlier decades of the 20th century can be viewed as even more exceptional, given the geographic obstacles that were overcome in order to achieve success at the Games. Prior to the 1970’s, Australian teams had fewer competitive opportunities compared to their northern hemisphere counterparts, as athletes were often competing out of season and travel involved costly, lengthy journeys by sea (Cashman, 2011a; Farrell, 1999). Furthermore, Olympians were often self-supporting or community-funded, as Australia did not have widespread infrastructure or support systems to provide coaching and other resources; this changed after the establishment of the Australian Institute of Sport (AIS) in 1981 (Cashman, 2002).

Beyond these international comparisons, Australian amateur sport was built on the foundations of ‘muscular Christianity’ which permeated Australian society and its elite, private schools particularly during the late-nineteenth century (Cashman, 2011a). This ideology of ‘muscular Christianity’ was grounded in the belief that sport led to the development of favourable Victorian ideals of ‘manliness’, which included self-reliance, sound judgement and overall robustness of the physical body, alongside fulfilling ideals of a chivalric, patriotic and militarist nature (Adair, 2010; Crotty, 2000; Horton, 2000). In particular, these ideologies of amateurism focused on the benefits of sport for affluent white males (Cashman, 2002). Coincidentally, they also related to Pierre de Coubertin’s admiration for the British public school sports system and subsequent impetus for founding the modern Olympic Games (Howell & Howell, 1988). In 1936, he was quoted as saying “The only true Olympic hero, as I have always said is the individual male adult. Therefore no women, no sports teams” (Gordon, 2014, p. 295).

Although Australia has an abundance of individual, male Olympic champions of which there are too many to name, several of the nation’s most well-known Olympic champions do not meet de Coubertin’s ideal. Shane Gould, Betty Cuthbert, Glynis Nunn, Debbie Flintoff-King, Susie O’Neill, Susan Balogh, Anna Meares, Chantelle Newbury, Petria Thomas, Stephanie Rice, Liesel Jones, Libby Trickett, Sally Pearson and Cathy Freeman are just some of Australia’s most well-known individual female champions from recent decades, whilst ‘The Woodies’ (men’s tennis doubles), ‘Oarsome Foursome’ (men’s rowing), ‘Hockeyroos (women’s hockey) and Kookaburras (men’s hockey) represent a sample of Australian Olympic sports teams who are equally well-known (Gordon, 2014). Evidently, many of Australia’s Olympic legends from early times until the present have not adhered to Australian ideologies of amateur sport or Coubertin’s vision of the modern Olympic Games.
Ultimately, this makes their place in Australia’s successful Olympic history all the more notable.

This history reflects the importance of the Olympic Games, not only for the broader Australian community, but at political and reputational levels also. It has been suggested that the Australian government and politicians enjoy the glory of national sporting success, given its reflections of broader national strength, character, confidence and vitality (Cashman, 2002; Independent Sports Panel, 2009; Stoddart, 1988). Using sport as a metaphor for both politics and life itself, there is a presentation to the public that winners and achievers are favoured (Kell, 2000; McKay, 1991). Whilst important for any nation, Hoberman (1993) suggests these attitudes are particularly valuable for relatively small countries like Australia. This is due to sporting success being equated with national self-assertion and worth, whereby Olympic success can be interpreted to have wider political and economic meanings on a global scale, akin to a display of ‘soft power’ (Nye, 2008).

For these reasons, following a poor performance by the Australian team at the 1976 Montreal Olympic Games, and based on the reports of Professor John Bloomfield and Dr Allan Coles, the Fraser government established the Australian Institute of Sport (AIS) (Gordon, 2014; Ward, 2010). Failure to achieve Olympic success was viewed as unacceptable and deemed to be an obvious sign the population was ‘degenerating’. London newspapers reported that Australia was ‘like a middle-aged athlete gone flabby’ and led to a national identity crisis (Gordon, 2014). Accordingly, the taking of such measures by the Government, indicates the prominence of sporting success in Australia compared to other types of cultural achievements (Stoddart, 1988) and the highly valued relationship Australia shares with the Olympic Games.

Since 1976, government attitudes towards Australia’s Olympic performance have not changed. Given Australia’s history of generally strong Olympic performance relative to population size, it is perhaps unsurprising that success at the Games has become a national expectation. Australia finished in the top five countries (based on total number of medals won) at four Olympic Games between 1992-2008 (Independent Sports Panel, 2009), with performance peaking in Athens 2004 (Australian Sports Commission, 2012). Placing fourth in the gold medal tally behind highly populous countries like the United States (293 million), China (1.3 billion) and Russia (149 million) at Athens, was a noteworthy achievement for a small nation of 20 million, familiar with punching above its weight on the international sports scene (Coates, 2008). Phenomenal amounts of funding from government and other sources are directed towards Olympic and elite level sport in Australia. Australia has produced costly
and successful bids to host the Games twice in less than 50 years (Cashman, 2002; Kell, 2000); a significant achievement, unequalled by other countries of comparative size.

Looking towards the future, Australia has ongoing ambitions of achieving and maintaining a top-five gold medal count at the summer Olympic Games. This goal was highlighted in Australia's 'Winning Edge' high performance strategy, which was formulated following an unexpected drop in overall medal tally placing at the London 2012 Games (Australian Sports Commission, 2012). Strategically approaching these new competitive challenges in the international sports realm is considered of high importance by the Australian government, due to the high costs associated with elite level sport. Prior to London 2012, an estimated $589 million was spent on Australia's Olympic team over a four year period, with $170 million spent on elite sport annually (Stensholt, 2012). Furthermore, the 2009 Crawford Report estimated each gold medal won by Australia to be worth approximately AUD$15 million (Independent Sports Panel, 2009). These figures suggest a substantial commitment to elite level sport and highlight both financially and tangibly the importance Australia places on Olympic sport and achievement in this domain.

When considering the financial cost of the Olympic Games and elite sport in Australia, care must be taken when assuming a cause and effect relationship between funding and Olympic success. Indeed, it cannot be denied that groups of countries traditionally strong at international sport are wealthy western countries like Australia (Ferguson, 2006); this may imply a correlation between national wealth and success. Nor can it be assumed that success is accidental, or a simple question of natural talent (Coates, 2008). Ferguson (2006) states there are many other countries with a pioneering background and favourable climate similar to Australia, but lack certain advantages Australia possesses.

It has been suggested Australia's geographical distance from World War II allowed for the nation's freedom, diet, way of life and high standard of living to become distinct from European countries and enabled uninterrupted development of a rich sports heritage (Ferguson, 2006; Gordon, 2014). Such hypotheses coincide with Gordon's (2008) reports that an 'age of confidence' began for Australia in the 1950's, lasting the following two decades. During this time it was perceived that Australia took sporting success for granted at both the Olympics and in other sports like tennis, cricket and golf. A strong volunteer base at sports clubs is also believed to have contributed to Australia's sporting and Olympic success (Ferguson, 2006).
Historically, Australia had few formal institutions providing sporting opportunities, which meant individuals and communities needed self-reliance to form teams, clubs and ongoing competitions. Volunteers make a valuable contribution to Australian society, both socially and economically. Sport and physical recreation organisations proportionally attract the most volunteers, with 2.3 million people (37% of the population) estimated to have donated their time during 2010 (Australian Bureau of Statistics, 2012). This volunteering tradition is believed to provide Australia with a competitive advantage, as it is not replicated in many other countries (Independent Sports Panel, 2009). Indirectly, this is an integral component of Australia's high performance sporting strategy and continued success at the Olympic Games. Maintaining volunteering rates can ensure Australia's grassroots sporting clubs and associated talent pool can continue to flourish in years to come; an important point of consideration, given the well-established connection between grassroots and high performance sports in Australia (Australian Sports Commission, 2012).

Despite achieving regular international success, much occurs in team sports including cricket, rugby and netball, which are dominant within, and often confined to, Commonwealth countries (Cashman, 2011a). Historically, the Games was one of few occasions for Australian athletes to appear on the world sporting stage and as a result has partially underpinned the ongoing investment of individuals, community and the government into Olympic sport. Given the high cost of this ongoing investment, it is becoming increasingly important to continue building knowledge around the holistic development of elite Australian athletes. Investigating Olympians’ early developmental experiences may highlight some of the modifiable and non-modifiable factors surrounding their athletic development. Accordingly, such knowledge may provide new insights, which have the potential to inform future policy and practice. This relates to building positive athlete development experiences at the grassroots level, as well as contributing to and promoting new evidence-based measures of talent identification.

Taking these measures and planning into the future is especially important for less populous nations like Australia who have a relative lack of talent pool depth on a global scale. It is imperative that the nation’s sporting talent is nurtured through working harder and smarter by making the most of all available resources and knowledge (Ferguson, 2006). Knowledge in this field may be progressed as a result of undertaking this study, and may assist with better-informed decisions being made regarding funding and resource structures within Australian sport. Ultimately, ongoing investment devoted to high-performance sport will enhance opportunities for maximum benefit to be achieved (Gordon, 2014), particularly if Australia intends to maintain its international competitive edge in the 21st century sporting arena alongside countries spending significantly higher amounts on elite sport.
2.2.3 The role of sport in Australian communities and localities

In reviewing the place sport and the Olympic Games hold at a national level, it is also important to consider its role and influence in smaller localities. The importance of sport and clubs to communities has been widely recognised by their contributions across historical, political and sociological contexts (Jarvie, 2006). They also contribute social, cultural and economic benefits to individual communities (Long & Sanderson, 2001; Tonts, 2005). Mutual interests and shared experiences obtained through sport, create the potential for social capital to be built amongst Australian communities and the individuals residing within them (Australian Bureau of Statistics, 2011b). Social capital is founded on networks of mutual support, reciprocity and trust (Australian Bureau of Statistics, 2011b) and is often associated with the philosophies of Putnam (1995), Coleman (1988) and Cox (1995, 2000). Despite some minor differences, these authors agree social capital is the ‘social fabric’ or ‘glue’ that facilitates cooperation amongst a group or given locality, in order to work towards pursuing shared objectives.

Social capital is associated with the interaction, sharing and sense of community found within sports clubs, with this setting often viewed as an opportunity for furthering social capital development (Australian Bureau of Statistics, 2011b; Burnett, 2006; Okayasu, 2010; Walseth, 2007). This is epitomised by the self-help and voluntary work critical to the sustenance of community sports clubs (Collins, 2003). In Australia, sports clubs have been viewed as agents for local communities to forge their identities, gain broader social recognition alongside building unity, pride and loyalty (Stoddart, 1988; Townsend et al., 2002). Accordingly, sport may allow for geographic communities to unite and share a common purpose (Hughson, Inglis, & Free, 2005). This has become important in an increasingly secular Australian society whereby sports clubs have become replacements for church groups as an avenue for social interaction and development of community ties (Spaaij, 2011).

It is however important to consider that these idealistic and traditionally held views may not always reflect the reality of modern Australia’s sporting landscape. Foley, Taylor and Maxwell (2011) suggest that these optimistic views of Australian sport embody the traditions of Anglo privilege that have remained deeply embedded in and unchallenged throughout much of colonial Australian history. Accordingly, social capital has also been identified as having a dark side, whereby dominant groups use their social power to maintain privilege and reinforce exclusive ties, identities and social hierarchy to the exclusion of perceived outsiders (Foley et al., 2011; Whittaker & Holland-Smith, 2016). Issues of racism, gender equity, social cohesion and cultural diversity always been present within Australian
sport, but have come under increasing scrutiny particularly in twenty-first century Australia (Foley et al., 2011).

Historically, females were restrained in their ability to spectate and participate in a number of sports due to colonial adherence of English cultural values and the principles of paternalism (Waterhouse, 1995), which reinforced the male-female divide (Crotty, 2000). Although, in other settings some men have also been exempt from benefiting from the social capital that comes inherent for dominant groups participating in Australian community sport. Aboriginal involvement in white-organised sport has traditionally been complicated by disrespect, exclusion and marginalisation, with the exception of some performers who have experienced a greater degree of adulation (Adair & Stronach, 2011; Tatz, 2011). These challenges have extended to new migrants in sports such as Australian Football (AFL) whereby the path to success has been paved with labelling and racist taunts (Booth and Tatz, 2000). More recently, the ongoing influx of new migrants to Australia has seen women from culturally, linguistically and religiously diverse backgrounds have their own difficulties engaging in local community sports clubs, alongside those from refugee backgrounds or living with a disability (Block & Gibbs, 2017; Cortis, Sawrikar & Muir, 2007; Dukic, McDonald & Spaaij, 2017; Jeanes, O’Connor & Alfrey, 2015; Spaaij et al., 2014).

Despite these potential limitations of community sports for some individuals and groups, localities where sport is highly regarded may motivate a greater number of individuals to become involved in sport and PA. Based on participation numbers, such a trend is evidently occurring within various communities around Australia. For 2013-14, the Australian Bureau of Statistics reported: a majority (60%) of the Australian population 15 years and over were involved in sport and PA, with approximately a quarter (26%) of those in this age group, regularly involved in sporting activities at organised clubs. In contrast, sports club membership was much higher (60%) for children under 15 years of age (Australian Bureau of Statistics, 2013e, 2015).

Positive social experiences are likely to be borne from a sense of belonging, identity and social interaction that sports clubs provide (Light, Harvey, & Memmert, 2013). Clubs demonstrating strong, open, cohesive cultures with a sense of enjoyment and positivity have been found to be most predictive of successful junior athletic development environments (Larsen et al., 2013; Toohey et al., 2015). Research has also found that the social dimensions of a sporting club and the positive early experiences they provide, are influential upon young athlete’s decisions to remain at a club and specialise in a sport (Côté & Hay, 2002; Light et al., 2013). Accordingly, involvement in sports clubs can be considered
important not only to the broader community from a social perspective, but the individual athletes experiencing these settings.

From this knowledge, it can be inferred that individual Australian communities and their sporting cultures have the potential to impact a developing athlete's early experiences of sport. Such experiences will vary amongst different Australian communities, with potential to influence youth athletic developmental trajectories either productively or disruptively. With regard to the stated aims of this study, this thesis also seeks to investigate the early developmental environment of Australian Olympians at a local community level and examine the culture of local sports clubs. Attempting to identify a “hotspot” seeks to illuminate the positive features associated with sporting clubs and the broader community within a successful athlete talent development environment. There are however, several other individual and environmental factors known to influence athletic development and the attainment of expertise (Rees et al., 2016) as discussed in the following section.

2.3 Individual and environmental factors influencing athlete development and the attainment of expertise

Understanding pathways to elite athlete development continues to be a key focus for sporting stakeholders (Gulbin, Weissensteiner, Oldenziel, & Gagné, 2013). As competition between nations for Olympic medals intensifies, there is a greater need for sporting systems to successfully identify and develop talented athletes. Drawing upon evidence-based understanding to support these practices is increasingly necessary due to high expenditure associated with these undertakings (Rees et al., 2016). To maximise cost-effectiveness associated with developing athletic excellence, it is necessary to thoroughly understand both individual and environmental factors contributing to athlete development and expertise (Gulbin, Oldenziel, Weissensteiner, & Gagné, 2010).

Several variables identified as relevant to this study were derived from Rees et al. (2016) review of individual and environmental influences on the development of the world’s best sporting talent. In conjunction, these factors have the potential to directly or indirectly influence the development and expertise attainment of Australian Olympians and elite athletes. Evidently, the recipe to success in various domains is not due to nature or nurture, genes or environment, but rather the symbiotic relationships shared between these influences (Dweck, 2006; Robertson, 2012). Accordingly, it was deemed necessary to critically investigate individual and environmental variables to build an understanding of holistic athletic development.
2.3.1 Individual factors

It has long been argued that humans are active agents in their own development (Bateson, 2005; Heckhausen & Shane, 2015; Lerner & Busch-Rossnagel, 1981). As such, it is essential attention is given to the role individual athletes have in their own development across the realms of psychology, personality, genetics and early developmental experiences relating to play and practice.

2.3.1.1 Psychology and personality

Great performers are likely to share similar ways of thinking, attitudes and attributes (Rotella, 2015). This is particularly influential for elite athletes, given psychological traits and mindset are considered to be of equal or greater importance to talent, technical skill or other individual and environmental factors (Dweck, 2006). When competing at the highest level in any sport, competitors are likely to share similar physical and technical skills. Therefore, athletes possessing the desired psychological characteristics are often the most successful (Sheard, 2013). The relationship between mental attributes and success is so strong that Rees et al. (2016) determined there is moderate-high evidence that psychological factors are key contributors to super-elite performances in sport.

Although psychology pertains to athletes’ development at the most proximal level, debate exists regarding the extent to which individuals can influence their own cognitive factors. There is also uncertainty around whether human psychological characteristics arise from predominantly genetic or environmental influences (Brain & Mukherji, 2005). Traditionally, it has been suggested that personality traits are fixed, enduring aspects of human functioning which remain consistent across situations (Cattell, 1957; Eysenck, 1970). More recently, researchers have suggested that individual psychological traits are malleable through both personal and environmental factors, or as a bi-product of life changes.

Dweck’s (2006) fixed vs. growth mindset theory suggests humans have the capacity to consciously alter their key psychological attributes, irrespective of talent or ability. Whilst the fixed mindset pertains to individuals holding beliefs about personality, talents and capabilities being set, the growth mindset is contrastingly based on beliefs that everyone can change their basic qualities and grow through effort and experience. Principally, Dweck believes athletes with a growth mindset possess the most ‘character’ and thus will achieve greater success due to possessing desirable traits including resilience, self-motivation and responsibility. Alternatively, Weissensteiner, Abernethy and Farrow (2009) discovered that positive psychological attributes possessed by athletes can be influenced by a favourable socio-developmental environment, as opposed to being solely dependent upon the
individual. Whilst not disagreeing, Plotnik and Kouyoumdjian (2014), propose that personality changes naturally occur throughout a person’s lifespan, without having greater attribution to either personal or environmental factors.

Regardless of how psychological traits develop, it is evident that possessing those considered desirable is likely to exert positive influence on athletic development and performance. ‘Character’ is an often used yet frequently misunderstood term to describe favourable traits, which may arise innately through a set of unchangeable attributes (Tough, 2013), or alternatively through malleable abilities shaped by learning and practice (Peterson & Seligman, 2004). Encompassing several moral, social and emotional virtues, ‘character’ can be exemplified through possessing bravery, fairness, integrity, self-control, willpower, conscientiousness, grit and the ability to recognise interpersonal dynamics (Tough, 2013). Evidently, several of these qualities epitomise traits traditionally considered valuable, albeit not always present, within the psyche of elite athletes. Beyond this, optimism, confidence, persistence, drive, passion, emotional stability, mental toughness, competitiveness, strong will and a solid work ethic are other assets commonly possessed by elite performers (Brown, 2001; Rotella, 2015). Ultimately, these attributes can assist elite athletes to work harder, smarter and stay focused under pressure when the stakes are high (Rotella, 2015).

Naturally, possessing these qualities does not guarantee success, nor will successful athletes be equally skilled in these areas. Empirical and anecdotal evidence however, suggests that many successful elite athletes possess several of these traits. Gulbin et al. (2010) discovered that compared to other elite athletes, Olympians scored significantly higher across several key personality and psychological traits. These included being autonomous, competitive, resilient, patience to repeatedly practice the same skills, tolerance for pressure alongside possessing strong ability to retain complete focus. Bloom’s (1985) study similarly found that children who ‘made it’ in their field possessed high levels of persistence, competitiveness and eagerness, rather than being the most talented. Anecdotally, Coates (2005) found that many parents of elite athletes and Olympians recognised such psychological traits in their child-athlete during their formative years.

Despite strong knowledge existing around psychological assets possessed by elite athletes, the complexities underpinning the growth of these traits through early developmental experiences are not fully understood. One explanation may be present within the “rage to master” concept, whereby gifted children possess strong intrinsic motivation from a young age to gain new information, skills and mastery in their field (Colvin, 2010; Winner, 1996). These notions relate closely to Duckworth’s (2016) “grit”, which is defined by the unique combination of passion and long-term perseverance which are often pre-cursors
to high achievement. Both these concepts support the notion of individuals possessing
greater motivation to continue developing their skills and abilities when they demonstrate
natural talent or passion for a particular domain. Accordingly, intrinsic motivation or the “rage
to master” could be understood as being highly beneficial to athlete development. Dedicated
focus towards practicing key skills and activities from a young age may enable developing
athletes to work towards attaining their 10,000 hours of deliberate practice (Ericsson,
Krampe, & Tesch-Römer, 1993); a theory underlying the attainment of expert performance
which will be investigated in greater depth later in this chapter.

Contrary to Ericsson et al’s. (1993) theory, which supports the idea of habitual
practice leading to high achievement across several fields, is the notion of innate talent
being a pre-cursor to compulsive practice (Colvin, 2010). For instance, during Tiger Woods’
childhood his parents discovered that his golfing interest was paired with unusually high
levels of coordination for this age. Subsequently, this stimulated his talent development for
golf with such occurrences being classified as ‘capitalisation learning’; a situation in which
individuals become skilled in a particular area by building upon their natural strengths
through continued, enjoyable practice (Gladwell, 2013).

‘Capitalisation learning’ closely relates to another phenomenon known as the ‘The
Multiplier Effect’ (Ceci, Barnett, & Kanaya, 2003), which implies initial small advantages can
spark a series of events that produce far greater benefits. Colvin (2010) suggests that a child
with slightly above average abilities in their field may take pride in initially being a strong
performer compared to peers. This may then enhance motivation to regularly practice
relevant skills, which results in incremental gains being made, leading to the possibility of
obtaining professional coaching, opportunities to watch regular games and try out for teams.
Long-term, this positions the individual to become increasingly matched to environments
contributing to the ongoing development of their skills. Ultimately, several factors which
initially seemed insignificant, may be multiplied by subsequent events and produce a
‘snowball effect’ beneficial to their overall athletic development.

Although advantageous when occurring early within an athlete’s developmental
sequence, these experiences do not necessarily have to occur at a young age for positive
psychological traits to be honed within prospective elite athletes. High achievers in sport and
other domains were rarely considered child prodigies (Colvin, 2010), which suggests that
key skills required to become an elite athlete can arise in other ways.
2.3.1.2 Early sports history

The development of elite sporting ability arises from a combination of variables, including training factors (Tucker & Collins, 2012b). When considering how sports history can influence athlete development, all relevant experiences starting from childhood should be examined. Informal, outdoor play in childhood is a common past-time in many adults’ life history, yet can provide the foundations to becoming an elite athlete. Referred to as ‘deliberate play’ or ‘spontaneous practice’, Côté, Erickson, and Abernethy (2013) place these enjoyable childhood experiences at the nexus to positive athlete development. Backyard sporting games using adapted rules, which by nature are inherently motivating, enjoyable and provide immediate gratification, exemplify these experiences. This innate sense of playfulness allows early sports experiences to be fun and develops passion for an activity which can result in enhanced motivation for future formal training (Oakley, 2014).

Additionally, skill-acquisition can occur in safe, low-risk environments encouraging experimentation, adaptability, creativity and spontaneity (Côté et al., 2013). Large quantities of ‘deliberate play’ can allow children to establish several motor and cognitive experiences, which can later be transferred to their principal sport (Côté, Lidor, & Hackfort, 2009).

These early play experiences can often crossover with the development of several Fundamental Movement Skills (FMS), including locomotion (running, hopping, skipping), object manipulation (catching, throwing, grasping, striking) and stability (balance, rotation). Competency in these areas has been found to positively correlate with physical activity (PA) amongst children and adolescents (Lubans, Morgan, Cliff, Barnett, & Okely, 2010). Inadequate FMS development and physical literacy in childhood from both play and instruction, may contribute to fewer participation opportunities for sport and PA throughout the lifespan (Balyi, Way, & Higgs, 2013; Higgs, Balyi, & Way, 2008), and potential failure to reach genetic potential or optimal performance (Balyi et al., 2013). When progressively built upon, many of these skills have the potential to be transferred from play into sport (Johnson, 2010). So important are FMS in childhood for developing athletes, that Gulbin, Crosier, Morley, and Weissensteiner (2013) place these skills at the foundation level of their FTEM (Foundations, Talent, Elite and Mastery) framework, which aims to holistically optimise athlete development. Within this model, an ‘active lifestyle’ and early exposure to a range of movement experiences are portrayed as necessary pre-cursors to ‘sporting excellence’.

FMS can be developed not only through play, but through sampling multiple sports in childhood. By contrast the antithesis to early specialisation, early diversification encourages childhood participation in many sports with the inclusion of extensive, unstructured sporting play (Güllich, Kovar, Zart, & Reimann, 2016). Sampling not only enhances the probability of
athlete’s being matched with a sport they are most suited to, it can also lead to sustainable development and longevity of athletic careers (Côté et al., 2009; Oakley, 2014). Prolonging motivation and engagement for sporting activities, developing FMS in early life and decreased risk of overuse injuries are all contributing factors to this enhanced longevity and sustainable athletic development. Perhaps most importantly, undertaking this pathway of early diversification does not appear to hinder an athlete’s chances of becoming elite in sports where peak performance occurs after maturation (Côté & Vierimaa, 2014).

In retrospectively examining the developmental experiences of high performance Australian athletes and Olympians, Gulbin et al. (2010) discovered that prior to specialisation, diverse sporting experiences were prevalent amongst the cohort. Support for early diversification has also been found in several other retrospective studies (Barreiros, Côté, & Fonseca, 2013; Berry, Abernethy, & Côté, 2008; Bridge & Toms, 2013; Güllich, 2014). Overall, there appears to be a high degree of evidence demonstrating that sampling will not adversely affect elite athletes’ development in sports where performance peaks occur in adulthood (Côté & Vierimaa, 2014).

Such possibilities contradict proponents of early specialisation, whose approach is focused on early, invested involvement in one sport, together with high intensity, formal training in competitive settings (Baker, Cobley, & Fraser-Thomas, 2009). This pathway to athlete development can lead to elite performance in adulthood (Ward, Hodges, Williams, & Starkes, 2004) with positive relationships demonstrated between time spent practicing and level of achievement. This has been most strongly exemplified through Ericsson et al’s. (1993) deliberate practice theory, which has been inextricably connected to the acquisition of expert performance across several domains. Regardless of natural talent, this ideal proposes that individuals can attain expertise in their field, following at least ten years or approximately 10,000 hours of deliberate, intensive practice.

The simplicity of this message has a high level of appeal, given the theory indicates that anyone can become a champion with perseverance and a strong work ethic (Oakley, 2014). Ankersen (2015), Colvin (2010), Coyle (2009), Gladwell (2008) and Syed (2010) further support this idea through a collective belief that talent is not born, but rather nurtured through hard work and purposeful practice. Alongside supporting the deliberate practice theory, these authors propose high-performing individuals are more likely to be passionate, focused, hard-working and willing to make a greater number of sacrifices. Not ascribed to natural talent, each of these attributes could be a realistic achievement for many.
Other research has however, found that early specialisation and high levels of focused practice in childhood often correlates with several negative consequences across physical, psychological and social development realms (Baker, Cobley, et al., 2009). Sports dropout, burnout and physical injuries are more prevalent amongst young athletes who specialise at an early age (Côté & Vierimaa, 2014; DiFiori et al., 2014; Huxley, O’Connor & Healey, 2014; Jayanthi, LaBella, Fischer, Pasulka, & Dugas, 2015). In their 2015 consensus statement on youth athletic development, the International Olympic Committee (IOC) acknowledged these factors as increasingly problematic for athlete development, particularly in light of growing professionalisation within youth sport (Bergeron et al., 2015).

Ultimately, the debate between early diversification and early specialisation pathways to elite athletic development is ongoing. No two athletes are likely to experience the same outcomes from these practices, regardless of training and sports history. Partly, these different outcomes may arise from influences most proximal to the individual. High performers are often in possession of inherited and environmental advantages alongside exposure to the right opportunities (Oakley, 2014; Robertson, 2012; Syed, 2010). Accordingly, it is necessary to explore how athletes’ unique genetic codes can influence their sporting history, trainability and concurrent development.

2.3.1.3 Genetics

Both scientific and sporting communities have come to recognise that genetic influences undoubtedly contribute to athletic performance (Guth & Roth, 2013). Within the sports sciences, there is compelling evidence that genetics are central to physical capability, athletic development and one’s ability to achieve elite status (Eynon et al., 2011). Although deliberate training and other environmental factors influence elite performance, such factors alone are incapable of producing athletic greatness, with an individual’s DNA ultimately dictating performance thresholds (Tucker & Collins, 2012b).

Although not all prior genetics studies have involved elite or Olympic athletes, there has been sufficient evidence regarding the influence of genetics upon athletic potential. The HERITAGE (Health, Risk factors, Exercise Training And Genetics) Family Study has been seminal in demonstrating how familial genetic similarity can account for many of the gains experienced from physical training (Bouchard et al., 1999; Bouchard et al., 2011). Other researchers have produced similar findings for multiple features pertaining to athletic ability including: agility, sprinting, jumping, throwing, aerobic capacity, height, arm span, personality and susceptibility to injury (Bouchard, Malina, & Perusse, 1997; Collins, September, & Posthumus, 2015; Lewis & Bates, 2014; Oakley, 2014; Okuda, Horii, & Kano, 2005; Tucker & Collins, 2012a).
Accordingly, each of these features may directly or indirectly influence the training and subsequent success or failure of individual athletes (Tucker & Collins, 2012a). Epstein (2013) proposes that elite athletes may be ‘gifted with high trainability’ through genetic influences, even if they do not have high levels of baseline fitness or natural ability. Similarly, Oakley (2014) suggests that each of the professional and Olympic athletes profiled within his book are likely to have been ‘genetic responders’ to training, which allowed their innate genetic potential to be extracted. He further proposes that this potential is likely to be of greatest influence in sports where seconds, centimetres and grams separate winners and losers and which primarily focus on optimising physical performance. Comparatively, team or skill-based sports may be more influenced by strategy and other skills requiring ongoing refinement (Oakley, 2014).

Alternatively, Robertson (2012) argues that placing too much emphasis on the contribution of genetics to capability, or subscribing to views of ‘genetic fatalism’ can be detrimental to an athlete’s ability to achieve success. Syed (2010) expands these views by suggesting that a ‘talent theory of expertise’ potentially prevents individuals from being sufficiently motivated to better themselves. In part, such views undermine Dweck’s (2006) ‘growth mindset’, Duckworth’s (2016) ‘grit’ or Ericsson et al.’s. (1993) emphasis on deliberate practice. Instead, Robertson (2012) believes that consideration of both individual and environmental influences can allow individuals to grow beyond their genetic potential in the quest for high achievement.

Other researchers similarly agree that inordinate emphasis should not be placed on genetic contributions to unlocking athletic ability. Despite acknowledging that favourable genetics combined with optimal training environments are necessary for successful performance, Guth and Roth (2013) argue few genes are consistently associated with elite performance and cannot be readily used to predict or explain athletic success. Likewise, Ericsson, Nandagopal, and Roring (2009) acknowledge that genes are necessary to become a top performer in any domain; however, they believe unique external adaptations that activate genes within healthy individuals’ DNA can make the greatest difference. This is because nature and nurture are so inextricably connected within the domain of athletic performance that one cannot be observed without the other (Epstein, 2013).

Accordingly, given that everyone has a varying genotype, individuals should ideally be exposed to different environments for optimal development (Tanner, 1990). Oakley (2014) exemplifies these notions through the concept of epigenetics, where genes will either be ‘dimmed’ or ‘multiplied’ depending on events occurring in young athletes’ external environments. Ultimately, although genetics may be considered to play some role in talent
development, it has been argued that difference in early experiences, opportunities, habits and practice are the real determinants of excellence (Howe, Davidson & Sloboda, 1998). For these reasons, it is essential to explore several environmental factors which may influence athlete development.

2.3.2 Environmental factors

Evidently, the development of Olympians is multi-dimensional and contributable to a range of individual and peripheral factors (O’Neill, 2015) which harmonise to determine athletic success and performance attainment (Baker & Horton, 2004). Often, athlete and sport-specific variables can be influenced by environmental, system and chance factors (Bergeron et al., 2015). It is therefore necessary to explore several influential environmental factors, which may modify athletes’ developmental experiences regardless of their psychology, genetics or early sports history. The roles of the athlete’s entourage and their social and physical environment are some of the broader influences to be investigated within this section.

2.3.2.1 The Entourage

As the IOC (2014, 2015a) suggest, the entourage play a fundamental role within an Olympians career. The entourage includes, but is not limited to family, coaches, peers, sports clubs, schools, teachers and other individuals with whom athletes regularly associate (O’Neill, 2015). These individuals form a vital support system for athletes, whilst simultaneously enhancing outcomes of their sporting career (International Olympic Committee, 2014). Many athletes are known to have benefitted from a supportive and encouraging entourage throughout their development (Doll-Tepper, 2012; Rees et al., 2016).

2.3.2.1.1 Family

Family are consistently identified as being highly influential for athletic development and expertise attainment in sport (Bloom, 1985; Côté, 1999; Fraser-Thomas, Strachan, & Jeffery-Tosoni, 2013; Hopwood, Farrow, MacMahon, & Baker, 2015; Kay, 2000; Kay & Spaaij, 2012; Weissensteiner et al., 2009). Although athlete’s cannot become successful through family support alone, family provision of a stimulating, supportive socio-developmental background is considered integral to the emergence of expertise (Weissensteiner et al., 2009). This is due to family providing the primary social setting for athletes to develop their identity, self-esteem, motivation, discipline and understanding about the value of achievement (Hellstedt, 2005).
Although champions are not raised in a particular way (Oakley, 2014), research has highlighted several key influences likely to be present within a developing athlete’s home environment. Studies have found effective parenting in sport broadly pertains to several key areas including: emotional and tangible support alongside parent role modelling and the facilitation of social and personal development opportunities for their child-athlete (Bloom, 1985; Côté, 1999; Csikszentmihalyi, Rathunde, & Whalen, 1993; Fraser-Thomas et al., 2013; Hodge, Pierce, Taylor, & Button, 2012; Oakley, 2014; Saelens & Kerr, 2008).

Provision of these familial resources however, is likely to change over the course of a child-athlete’s career. Whilst parents may initiate sports involvement, arrange transportation and access to coaches at a young age, emotional and financial support are of greater importance as a child-athlete matures (Bloom, 1985; Côté, 1999).

Fundamentally, psychological and emotional family support is necessary for talented children to transform their potential into reality (Csikszentmihalyi et al., 1993). This includes providing a nurturing and understanding environment (Sloane, 1985) alongside offering support in times of injury, setbacks and pressure (Côté, 1999). Families that are not only supportive but stable, promote opportunities to take on new challenges and provide a balance between authoritative and autonomy-supportive parenting styles, are considered the most beneficial to athlete development (Csikszentmihalyi et al., 1993; Fraser-Thomas et al., 2013). Harwood, Douglas, and Minniti (2012) suggest that several of these features share similarity with those found in positive child-parent relationships, exemplified by Bowlby’s (1969) notion of secure attachment.

Parents are most often the key drivers for this psychological and emotional support (Fletcher & Sarkar, 2012; Gulbin et al., 2010; Weissensteiner et al., 2009), as reflected in the life histories of several high achievers in sport and beyond. Mozart, Tiger Woods, the Polgar sisters (world champion chess players) and Venus and Serena Williams are all individuals whose potential in early childhood flourished due to the home environment their parents created. In each case, parents were often hardworking, motivated and committed to helping their children develop their potential (Colvin, 2010; Syed, 2010). Common to these high achievers were high parental expectations, a culture of deliberate practice within the home and an influential father. This correlates with several athlete development studies, in which fathers were found to be a particularly influential psychosocial factor in athlete development (Hayman, Borkoles, Taylor, Hemmings, & Polman, 2014; Hayman, Polman, Taylor, Hemmings, & Borkoles, 2011; Phillips, Davids, Renshaw, & Portus, 2010a; Weissensteiner et al., 2009).
Comparatively, non-experts and youth sport dropouts are more likely to have experienced parental pressure during adolescence (Barreiros et al., 2013; Fraser-Thomas, Côté, & Deakin, 2008), which highlights the value of supportive parents (as opposed to parents who pressure their children) during early development. Not all high performers however, hail from cohesive, stable and supportive families. Conversely, unbalanced and dysfunctional families can also produce talented athletes (Gogarty & Williamson, 2009; van Rossum & van der Loo, 1997) and other high achievers (Coyle, 2009; Csikszentmihalyi et al., 1993; Gladwell, 2013). In such cases, good fortune, genetics and other early experiences may be attributable to the development of expert performance (Horton, 2012).

Beyond emotional support, youth athletes would be unable to partake in, or excel at, sport without family provision of tangible resources, often expressed financially and logistically. Tangible resources present within athletic families include: providing financial resources for training, competition and equipment, transportation to events, re-arranging family schedules and volunteering time for coaching, officiating and fundraising (Bloom, 1985; Côté, 1999; Fraser-Thomas et al., 2008; Fraser-Thomas et al., 2013). These resources are generally associated with the parental expense of finance, time and emotion (Côté, 1999), with mothers usually making the greatest logistical and social sacrifices (Wolfenden & Holt, 2005).

Usually, family resources are finite which may raise issues for a sole parent, low socioeconomic status (SES) families or larger families (Kay, 2000; Kay & Spaaij, 2012; Oakley, 2014). SES is often a proxy for income, which can influence resource availability for the promotion of childhood PA (Saelens & Kerr, 2008). Value and understanding of health benefits associated with PA is likely to be greater within families of high SES (Saelens & Kerr, 2008; Seabra et al., 2013), whilst low SES families are more likely to engage in sedentary behaviours (Tandon et al., 2012). Furthermore, organised sport is often associated with high costs for fees, equipment and time disruptions to the family unit which can cause unique challenges for both high and low income families. As Kay (2000) suggests, high income families may be characterised by a dual income whereby the employment of both parents creates limitations around family time for sporting activities, despite the presence of financial resources. Comparatively, low income families are likelier to have more people within the household and experience a higher incidence of family breakdown which creates financial deprivation and social damage. Collectively, these factors can create formidable barriers to forging connections with the structures that support sporting excellence. Accordingly, these findings highlight that household income can have a significant influence on children’s PA and sport participation (Rowley, 1992; Saelens & Kerr, 2008).
Adequate family finances and resources are not only pertinent to grassroots sports; inequities also found to exist within high performance and professional sports (Collins & Buller, 2003; Khalil, Hopwood, Farrow, MacMahon, & Baker, 2014; Martin, 2015) and the academic world. High achievers in sport and education are often from middle-upper SES backgrounds, in part due to greater accessibility to resources assisting in their domain of achievement (Gladwell, 2008). Although effort, talent and mindset are vital to success, an individual’s access to resources and opportunities also plays a role. Affluent families can allow individuals to take greater risks and effort can be sustained until success is achieved (Dweck, 2006), thus, highlighting SES as a factor which can potentially influence an athlete’s extended journey to elite sport.

Collins and Buller (2003) suggest such inequities are a complex, Western-world issue, which mirror the conflicting objectives of elitism and universality in sport facing the IOC on a global scale. Whilst some high performers may have to overcome poverty, these circumstances are however not equivalent to lacking a supportive environment, which is deemed critical to success (Colvin, 2010). The concept that affluence is not always vital for success is reflected in the inverted-U hypothesis. This theory proposes that too much of any ‘good thing’, including familial advantage, can potentially lead to negative outcomes (Grant & Schwartz, 2011). It has been suggested that success is most likely to occur when people experience virtues at intermediate levels between deficiency and excess (Nussbaum, 1995, 2004). The implications of excessive virtue for success has also been raised by Gladwell (2013) and Robertson (2012), who found that a family’s high SES, wealth or prior achievement can only influence children’s success to a certain degree. When present in excessive quantities, there is potential for children to lose their ambition, pride and sense of self-worth, which may subsequently be detrimental to the attainment of success.

Irrespective of SES, parents are vital for positive role modelling alongside shaping important lifestyle behaviours and core values that cross-over into sport (Oakley, 2014). This includes instilling a strong work ethic, sense of sports-personship, persistence, the value of doing one’s best and developing a positive attitude (Fraser-Thomas et al., 2013; Oakley, 2014). Providing a steady home life, emphasising the importance of life balance, education and the productive use of time alongside holding high expectations are other features known to be present within the homes of high achievers (Bloom, 1985; Chua, 2011; Csikszentmihalyi et al., 1993; Lauer, Gould, Roman, & Pierce, 2010). Conversely, parents who display poor sportsmanship, emphasised winning or attempted to provide coach-like feedback, are often associated with poor youth sporting outcomes (Fraser-Thomas et al., 2008; Fraser-Thomas et al., 2013; Lauer et al., 2010).
Comparatively, there is much less known about sibling influence on athletic development (Hopwood et al., 2015), due to results in prior studies being inconclusive. In retrospective studies with high performing athletes, siblings are regularly considered positively with older siblings, especially being viewed as role models for younger siblings (Côté, 1999; Fraser-Thomas et al., 2008; Syed, 2010; Weissensteiner et al., 2009). Siblings contribute to the development of several physical and psychological attributes including providing motivation to be involved in sport, competitiveness, strategising, coping, mental toughness, modelling work ethic and providing a challenge for younger siblings to keep up with someone older and stronger (Davis & Meyer, 2008; Fraser-Thomas et al., 2008; Hodge et al., 2012; Weissensteiner et al., 2009). Although champion athletes may view sibling competition and rivalry positively (Oakley, 2014), they may also contribute to jealousy, negativity and stress, which may undermine athletic development in other settings (Côté, 1999; Davis & Meyer, 2008; Fraser-Thomas et al., 2008). It is evident however, that continued research is required in this area.

2.3.2.1.2 Coaches, teachers and peers

As the African proverb suggests, “it takes a village to raise a child” (West-Olatunji & Rush-Ossenbeck, 2016). In this light, an athlete’s entourage outside family, including coaches, teachers and peers can also powerfully influence early athletic development. These individuals are in regular contact with athletes outside of the home, within school and training environments. Beyond parents, coaches are considered a core influence throughout an athlete’s career, given the effect they have on satisfaction, motivation and performance (International Olympic Committee, 2016) beyond the requisite teaching of sport-specific skills. Children’s sport experiences, skill development, psychosocial outcomes and acquirement of mental toughness are strongly influenced by coaches (Connaughton, Hanton, & Jones, 2010; Horn, 2008; Smith & Smoll, 2007), as a consequence of their behaviours, interactions and communications (Erickson & Gilbert, 2013).

In their study of high performance Australian athletes, including Olympians, Gulbin et al. (2010) determined that most athletes felt coaches were ‘critical and highly influential’ to their talent development between grassroots and senior elite competition. Effective coaches are considered positive, enthusiastic, supportive, knowledgeable, respectful, goal-oriented and clear communicators (International Olympic Committee, 2016). These qualities align with many considered beneficial for an athlete at various stages of their development. Junior coaches who have the ability to motivate, encourage and instil passion are fondly recalled, whilst in high performance sport, athletes consider knowledgeable coaches, who are goal-oriented towards perfection as most valuable (Fraser-Thomas et al., 2008; Gulbin et al.,
Maintaining positive behaviours amongst junior athletes is essential given favouritism, poor communication skills, anger, an inability to relate to adolescents and an authoritarian style can be linked to less enjoyable early sports experiences and drop out (Fraser-Thomas et al., 2008).

Côté and Gilbert (2009) propose that outcomes of effective coaching can be exemplified through developing the four C’s (competence, confidence, connection and character) as part of holistic athlete development, particularly at the junior level. To maintain children’s active sports participation, coaches are responsible for creating developmentally appropriate learning environments which address these various components of holistic athlete development (Bailey, Cope, & Pearce, 2013). Repeated positive experiences in sport arising from engagement in fun and challenging activities, whilst simultaneously focusing on the four C’s is known to have long-range positive outcomes for participation and performance (Bergeron et al., 2015). Evidently, coaches can significantly influence athlete development, with these outcomes existing from the foundations of an athlete’s career.

Teachers are also key adults in a child-athlete’s life who can fundamentally influence athlete development. Retrospective studies of Australian and New Zealand elite athletes and Olympians found that teachers can have a positive and enduring influence on athlete development (Gulbin et al., 2010; Hodge et al., 2012; Phillips et al., 2010a). Schools are fundamental in providing athletes opportunities to develop several sporting skills, including the promotion of FMS including locomotive, manipulation and stability skills (Hodge et al., 2012). Teachers are considered to be prime identifiers of initial sporting talent (Gulbin et al., 2010) and may even introduce athletes to their eventual sport (Hodge et al., 2012). It is common for teachers to provide formal and informal instruction through coaching, umpiring or organising extracurricular school sports events (Hodge et al., 2012; Shehu & Akpata, 2008) and be informers about particular sports. Sometimes, this will be due to lack of parent understanding, resources encouraging sport involvement or general discouragement of sport due to potential interferences with education (Hodge et al., 2012; Phillips et al., 2010a; Tshube, 2014). Furthermore, it could also be proposed that teachers can have an equally beneficial influence on athlete development as a supplement to supportive parenting.

Once athletes do reach an elite level, schools that provide emotional and logistical resources by showing understanding of athlete’s commitments and allowing time off as required can be beneficial (Hodge et al., 2012). This supports the IOC’s recommendations that athletes should give preference to sports-friendly schools that assist their development (International Olympic Committee, 2015b). Ultimately, teachers are in a chief position to
widen youth sport participation, inspire life-long PA and encourage youth sporting aspirations (Shehu & Akpata, 2008); thus, their role in the entourage should not be underestimated.

Contrary to parents and coaches, relatively little research has focused on same age peer-athlete influences in youth athlete development (Bruner, Eys, & Turnnidge, 2013; Holt, Black, Tamminen, Fox, & Mandigo, 2008). The Developmental Model of Sport Participation (DMSP) (Côté, Baker, & Abernethy, 2003; Côté & Fraser-Thomas, 2007) advocates that peers within and outside of sport are strongly influential in children’s sports participation, especially during adolescence. The role of peers may also be partially dependent upon whether sampling or specialising trajectories were taken during early development (Strachan, Fraser-Thomas, & Nelson-Ferguson, 2016). Early specialisers are more likely to report diverse exposure to and influence by, peer groups, compared to samplers who report greater links to family, community and schools during early athlete development (Strachan, Côté, & Deakin, 2009).

Regardless of the developmental trajectory taken, peers can shape athlete’s motivations to participate in sport, alongside their personal and athletic development. Children are often drawn to sport by their peers for friendship and social purposes (Allen, 2003; Fraser-Thomas et al., 2008), with peers often have the greatest influence on sustaining enjoyment and motivation in sport throughout adolescence (Bruner et al., 2013; Chan, Lonsdale, & Fung, 2012; Keegan, Harwood, Spray, & Lavallee, 2014; Keegan, Harwood, Spray, & Lavallee, 2009). For elite athletes and Olympians, Barreiros et al. (2013) determined that peers significantly influenced athlete development given many athletes’ closest friendships existed within sporting contexts. From a competitive stance, senior peers can provide opportunity for younger athlete’s to train and compete against athletes older than themselves. This situation is able to provide younger athlete’s with challenges in a supportive environment, alongside an informal coach-mentor type relationship, which has the potential to enhance performance (Phillips et al., 2010a).

Furthermore, these peer influences not only serve to maintain athletic motivation, but facilitate avoidance of parties and alcohol outside of sport (Henriksen, Stambulova, & Roessler, 2010b). In contrast, peer-pressure to attend parties, sleepovers and other social events with school friends can be disruptive to athlete development (Fraser-Thomas et al., 2008) amongst external friends who could otherwise serve as supporters of young athletes (Gould, Dieffenback & Moffett, 2002). Considering these factors, it is clear that the entourage can deliver productive or disruptive influence to athletes’ throughout their development.
2.3.3 Social environment

Beyond an athlete's immediate entourage, the broader social milieu of their early developmental environment also has potential to influence their attainment of expertise. The relative age effect, birthplace effect phenomenon, development of global “hotspots”, demographics and SES are all features of the broader social environment to be examined in greater detail.

2.3.3.1 Relative age effect

In recent decades, a wide selection of sports science research has identified the Relative Age Effect (RAE) (Mujika et al., 2009; Wattie, Schorer, & Baker, 2015) as being a socially constructed influence upon athlete talent development and success. RAE refers to the performance disadvantages of children born later in the sporting year compared to those with birthdays shortly after the age group cut-off date (Okazaki, Keller, Fontana, & Gallagher, 2011). Subsequently, athletes born in the first half of their sporting season have been found to be more likely to develop into professional or elite athletes (Cobley et al., 2014; Vaeyens, Philippaerts, & Malina, 2005) due to potential for almost a one year age difference existing amongst youth athletes assigned to the same age-group categories (Cobley, Baker, Wattie, & McKenna, 2009). These differences can often be associated with greater strength and performance due to physical maturity among the relatively older athletes (Baker, Schorer, Cobley, Schimmer, & Wattie, 2009), with potential for coach team-selection decisions to be influenced by these variations (Furley & Memmert, 2016). Accordingly, physically larger, developed youth athletes may be more likely to be identified as ‘talented’ early on in their career, which may come with advantages such as becoming known to selectors holding power to provide further representative opportunities (Mujika et al., 2009; Vincent & Glamser, 2006), thus leading to greater access of high quality competition and coaching (Mujika et al., 2009). Although physical maturity does play a key role in the propagation of this phenomena, social agents such as parents, coaches, developmental environment and the athletes themselves have also been found in some cases to be instrumental (Hancock, Adler, & Côté, 2013; Hancock, Ste-Marie, & Young, 2013).

Irrespective of reasons underlying RAES, clear effects of this phenomena have been identified in numerous individual (Baker, Janning, Wong, Cobley, & Schorer, 2014; Brazo-Sayavera, Martinez-Valencia, Müller, Andronikos, & Martindale, 2017; Costa, Marques, Louro, Ferreira, & Marinho, 2013; Hollings, Hume, & Hopkins, 2014), team (Cobley et al., 2014; Côté, et al., 2006; Ishigami, 2016), and Olympic sport contexts (Albuquerque et al., 2015; Edginton, Gibson, & Connelly, 2014; Medeiros et al., 2017; O’Neill, Cotton, Palomares Cuadros, O’Connor, 2016; Raschner, Müller, & Hildebrandt, 2012) across several sports,
countries and genders. Predominantly, these RAEs have been found in sporting contexts pertaining to adolescent males and culturally popular, gender appropriate sports where there is greater competition for places on teams, such as at a representative level (Cobley, Baker, et al., 2009; Delorme, Boiché, & Raspaud, 2009; Müller, Hildebrandt, & Raschner, 2015). Clear RAEs have however, also been found in some cases among female athletes in predominantly team and Youth Winter Olympic sports (Raschner et al., 2012; Romann & Fuchslocher, 2011; Stenling & Holmström, 2014) although, to a comparatively lesser extent than male sports.

These male-female variations have been attributed to factors including the importance of strength and power in individual sports (Cobley, Baker, et al., 2009), sports-specific factors that provide preference to aesthetic quality and delayed development (Baker et al., 2014; Wattie et al., 2014), in addition to socially-constructed gender roles post-puberty (Vincent and Glamser, 2006). Overall, conflicting views remain towards whether RAEs are minimised as age groups increase, or incrementally rise with higher levels of sporting competition, which may extend into cohorts of senior athletes (Cobley, Baker, et al., 2009; Schorer, Baker, Büsch, Wilhelm, & Pabst, 2009) due to a range of social environmental factors.

2.3.3.2 Birthplace effect

Beyond knowledge that ‘when’ an athlete is born within their sporting year can influence athletic development and success, there is growing evidence highlighting the crucial role that an individual’s early sporting environment can also have in relation to these factors (Turnnidge, Hancock, & Côté, 2014). Known as the birthplace effect (BPE), this phenomenon is believed to influence sports participation, dropout and particularly the likelihood of reaching the elite level in sport (Balish, Rainham, & Blanchard, 2015; Bruner et al., 2011; Côté et al., 2006; Imtiaz, Hancock, Vierimaa, & Côté, 2014; Turnnidge et al., 2014). Largely, these outcomes are based on the size of the city where an athlete spent their developmental years given its influence on initial timing and exposure to athletic activities (Côté, Baker, & Abernethy, 2007; Rees et al., 2016).

Although Curtis and Birch’s (1987) and Carlson’s (1988) seminal research have both determined birthplace to be a valid determination of an athlete’s early developmental environment, more recent studies have disagreed. An athlete’s actual birthplace may not always validly or reliably measure early developmental environment, thus ‘birthplace’ has become a generic term used to establish an athlete’s early developmental location until around 14 years of age (Baker & Logan, 2007; Baker et al., 2009; Côté et al., 2006; MacDonald, Cheung et al., 2009). Often, athletes may be born in one place, grow up
elsewhere and commute daily to their primary and secondary schools in other locations (Oakley, 2014). For this reason, it is suggested that an athlete’s first sports club location may be a more appropriate proxy for their early developmental environment (Schorer, Baker, Lotz, & Busch, 2010), due to contextual factors associated with athletes’ initial exposure to sport, which is believed to have considerable influence (Côté et al., 2007; MacDonald, Cheung, et al., 2009).

Comparatively, other research has suggested that the concept of birthplace effects may be too simplistic, with the notion that geographic location alone influences athletic development and performance considered inaccurate. The reality of these associations is complex, with Baker et al (2014) positing that ‘community size effects’ may be a more accurate term for the causations underpinning the more widely acknowledged ‘birthplace effect’ phenomenon, based on their analysis of 25-years of data in the Canadian National Hockey League (NHL). The results of their study suggest that the importance of community size in athlete development cannot be underestimated and that not all developmental settings are equal in the opportunities they provide for emerging athletes. This effect persistence in North American contexts but not elsewhere, reinforces the notion that its influence is strongly driven by socio-cultural factors specific to the country under examination. These considerations share features with identified underlying factors for birthplace effect trends occurring, such as the quality of early training environments and available developmental assets including clubs, schools, coaches and competitions (Oakley, 2014). Regardless of whether the term birthplace or community size effect is used however, the broader factors underlying these phenomena and their accurate description are still not completely understood. This highlights the need to further investigate the influence of this phenomena in a broader context, alongside its implications for athlete development.

Talent development research has an extended history, with early developmental environment being prominently investigated since the inception of the field. Since the 19th century, studies of high achievement and its causal factors have been undertaken, with Galton (1869) first surmising the contribution of ‘nature’ to success. This appears to have catalysed ongoing nature-nurture debates within talent development and studies on ‘nurture’ have extended to include the BPE phenomenon. Investigations connecting sport and birthplace date from the late 1960’s, when Rooney (1969) established links between birthplace and North American college football participation. Shortly after, Greendorfer (1970) determined similar links between birthplace and sports representation by ascertaining that major league baseball players were under-represented in small towns and rural areas with population of less than 2,500. Conversely, Haerle’s (1971) research on major league players did not find a correlation between size of birthplace and level of performance.
Comparatively, both Carlson’s (1988) alongside Curtis and Birch’s (1987) research more closely exemplify recent outcomes of birthplace effect studies. Despite researching different sports in unrelated geographic locations, both studies discovered elite athletes were unlikely to come from large cities. Respectively, athletes from rural areas and communities ranging from 1000-500,000 inhabitants were most likely to produce elite athletes. Since that time, studies have produced largely similar and consistent trends despite incorporating several countries, sports, ages, competition levels and genders (MacDonald & Baker, 2013). Existing studies predominantly sample adult, male elite athletes, especially in North America (United States and Canada) and are quantitatively designed (Baker & Logan, 2007; Baker et al., 2014; Côté et al., 2006). Beyond this cohort, other studies have also investigated elite female (Baker, Schorer, Cobley, Schimmer, & Wattie, 2009; Fraser-Thomas, Côté, & MacDonald, 2010; Lidor et al., 2014; MacDonald, King, Côté, & Abernethy, 2009), adolescent (Baker & Logan, 2007; Bruner et al., 2011; Fraser-Thomas et al., 2010; Schorer et al., 2010; Turnnidge et al., 2014) and Olympic athletes (Baker, Schorer, Cobley, Schimmer, & Wattie, 2009; LaForge-MacKenzie, Schorer, Wattie, & Baker, 2015) to a smaller extent.

Although these studies have used a variety of athlete cohorts, sports and geographic locations, their findings have been similar. Commonly, results suggest that small-medium size communities (approx. 30,000 - 1,000,000 depending on the geographic or national context) are conducive to providing opportunities for success. There is however, wide variation given that a ‘medium’ or optimal city size in one country may be considered either small or large in others (Rees et al., 2016). For instance, areas with populations 10,000-29,999 were most likely to produce UK Olympians, whereas in Canada (areas with >100,000 population) and Germany (areas with populations between 2,500,000 and 4,999,999) Olympians were likely to come from cities of significantly larger sizes (Baker, Schorer, et al., 2009). Beyond these inter-country variations, Wattie, Schorer and Baker’s (2017) work directly investigates reasons underpinning why intra-national differences in birthplace (community size) effects can also occur, using findings from the Canadian context to challenge the status quo of many existing research outcomes within the field. In testing the heterogeneity of these effects between NHL draftees from across Canadian provinces, they found commonly used methods of aggregating national population data to test for birthplace effects, can often fail to acknowledge meaningful variations that may exist between national regions. Accordingly, using Canada as an example, their work proposes that the generalisability of small-medium community size narratives may not extend to all regions within a country in an ecologically valid or accurate way.
Furthermore, among other researchers there is increasing awareness that population density is likely to have as much influence on this phenomenon as population size alone given its implications for sport participation and athlete development (Hancock, Coutinho, Côté, & Mesquita, 2017; Rossing, Nielsen, Elbe, & Karbing, 2016). Population density can influence access to sports facilities, opportunity for outdoor PA and neighbourhood safety, which are all considered important for children’s sport development (MacDonald, Cheung, et al., 2009; Rossing et al., 2016).

Regardless of geographic location, localities outside of a ‘small-medium’ classification within their context are often considered disadvantageous in comparison. Some studies classified areas as ‘too small’ when there were <1000 inhabitants and ‘too large’ when there were >500,000 inhabitants (Côté et al., 2006; Curtis & Birch, 1987; MacDonald, Cheung, et al., 2009). Within this range, several studies have demonstrated that populations of <250,000 are particularly advantageous for athlete development (Côté et al., 2006; Lidor et al., 2014; Lidor, Côté, Arnon, Zeev, & Cohen-Maoz, 2010; MacDonald, King, et al., 2009; Schorer et al., 2010). Due to this range in results, it is necessary to investigate a possible Australian BPE amongst a cohort of 1984-2012 summer Olympians due to ideal city sizes varying significantly between countries.

Anomalies have existed however, depending on the sport or country observed. This highlights that variations in optimum sizes for early developmental environments can exist outside of the commonly defined parameters. Baker and Logan’s (2007) revelations that populations of 500,000-999,999 were beneficial for athlete development was much larger than other studies, whilst in other countries athletes originating from very small cities (<2000) were most likely to become elite (Lidor et al., 2014; Lidor et al., 2010). In other cases, BPE’s have been absent (Lidor, Côté, Arnon, Zeev, & Cohen-Maoz, 2010) and therefore suggests that athletes can have equal chance of becoming elite, regardless of their community of origin. In each case, the presence of broader social influences served as a catalyst for these unusual trends.

When a BPE was not found amongst Israel’s elite male, Division 1 basketball players (Lidor et al., 2010), it was hypothesised to be due to relatively few Israeli born players competing with Division 1 professional clubs. Mainly, this was a consequence of clubs drafting non-Israeli born players, especially from the United States (Galily & Sheard, 2002). Volleyball players from very small cities were most likely to be elite due to historic and cultural factors in Israel (Lidor et al., 2010; Lidor et al., 2014) where ball games like volleyball, have traditionally been played in very small villages and cooperative farming
settlements. Comparatively, volleyball has been developed and offered to city children in later years (Lidor & Bar-Eli, 1998; Lidor et al., 2010).

Although a similar breadth of ‘birthplace effect’ type studies have not historically been conducted in Australia, there have been large-scale studies in the field conducted in recent years (Toohey et al., 2015; Toohey et al., 2017; Woolcock & Burke, 2013). Similarly, these studies used transdisciplinary approaches to investigate why some geographic areas of Australia produce a greater number of participants and elite performers (male and female) than others in sports including Australian Rules football (AFL), cricket, kayaking and tennis. Uniquely, they also investigated why some regions may have under-produced or were ‘low-yield’ at a high performance level when compared to their junior participation numbers.

Woolcock and Burke’s (2013) study encompassed 1290 senior male AFL players over a 13-year period and highlighted a number of considerations distinguishing ‘low’ versus ‘high’ yield regions. Coaching and competition standards, cultural significance of a sport within a region, availability of playing fields, proportion of young males within the population and availability of competing leisure interests were all considered to potentially have some influence over these differences. They also posit that transport availability, remoteness and socioeconomic status may play a role, however requires further investigation. Toohey et al (2017) also investigated and highlighted the influence of similar variables including broader community and environment factors (socio-economic advantage/disadvantage, transport accessibility and remoteness and physical activity), training, social and organisational factors (local clubs, national and state sport governing bodies, governments, institutes and academies of sport) and individual athlete psychological measures in terms of their relationships with the regions’ talent yield.

Despite the number of BPE studies conducted and recent Australian studies implementing transdisciplinary approaches to explore applied reasoning for talent development variations, complete understanding of reasons underpinning the differences in athlete development outcomes amongst cities of varying size remain inconclusive. Broadly, these differences can be epitomised by both social and geographic influences (Horton, 2012). For simplicity, the term “rural” will be used for these influences associated with smaller communities, whilst “urban” will exemplify more densely populated regions. Despite some of these influences being related to the physical environment, they will be discussed here for greater continuity and clarity.
Several researchers have highlighted the features of “rural” localities which have potential to enhance athlete development. MacDonald, King, Côté, and Abernethy (2009) propose that within these areas there is a greater emphasis on and shared approach to, sports participation amongst families, schools and the wider community. Accordingly, this can increase opportunities for social interaction within areas that are otherwise sparsely populated, isolated or have few competing recreational opportunities (Craike, Symons, Eime, Payne, & Harvey, 2011). Furthermore, sport can provide young people the opportunity for greater social mobility, not only to enhance peer group status, but also provide an opportunity to move beyond the town in which they were raised (Craike et al., 2011; Curtis & Birch, 1987; Ronberg, 1975; Schultz, 1981). Additionally, the small and close knit nature of these communities may facilitate elite athlete development through the presence of more supportive psychosocial environments (Côté et al., 2006) and community clubs where sports-related volunteering is higher (Balish, Rainham, & Blanchard, 2016). These factors may relate to athletes from small communities having closer coach-athlete ties, resulting in a developing athlete being given closer attention from a young age (MacDonald, King, et al., 2009). This may result in additional instruction, support and the identification of talent occurring earlier. Accordingly, a ‘virtuous circle’ for young athletes may eventuate, in which they have enhanced motivation to participate and achieve in sport alongside having the confidence to progress (Horton, 2012; Oakley, 2014).

The ‘big fish, little pond effect’ is relevant in this context; this theory originally derived from academic settings in which correlations have been found between self-concept and the school-type a student attends. When surrounded by many other high achievers, self-concept can suffer, regardless of ability (Marsh, 1987; Seaton, Marsh, & Craven, 2009). According to the ‘relative deprivation’ phenomenon, individuals are likely to form perceptions of themselves, based on comparison to others they perceive to be in similar situations (Davis, 1966; Gladwell, 2013; Stouffer, Suchman, DeVinney, Star, & Williams, 1949). Accordingly, this can positively or negatively distort self-confidence and concurrently influence an individual’s motivation, confidence, willingness to accept challenges and ultimately success (Gladwell, 2013).

When substituting high school size and ability for small towns and athletic ability, it is evident that a similar principle can be applied. For young athletes, there can be a range of developmental and psychological benefits arising from being ‘protected’ from an overly competitive environment (Horton, 2012), analogous to being a ‘small fish in a big pond’. By contrast, when athletes are a ‘big fish’ characterised by a relatively strong sporting ability, Gladwell (2013) asserts that ‘small ponds’ can be welcoming places where friendships and support within communities are more easily built, relative to ‘larger ponds’. In this light, the
type of early sporting experiences and competition young athletes are involved with in small communities can be beneficial. It has been proposed that smaller communities can teach developing athletes a range of things including how to cooperate and set appropriate process and outcome goals. Such communities also provide athletes a greater opportunity to develop helpful relationships and a sense of belonging; each of which in turn can enhance their motivation to excel (Oakley, 2014; Shields & Bredemeier, 2009).

Beyond the milieu of small communities, in "urban" areas ease of access to natural and man-made facilities is believed to be greater due to their close proximity, broader range of play spaces on offer, alongside a perceived sense of safety and independent mobility from a young age (Horton, 2012; Kyttä, 2002; MacDonald, King, et al., 2009). Subsequently, children may engage in more non-organised sport and deliberate play throughout development (Surya, Bruner, MacDonald, & Côté, 2012). Furthermore, facilities are considered cheaper to access than in urban areas and there is less competition for their access as well as places on associated sports teams (Horton, 2012). Accordingly, this may result in greater exposure to a variety of sports and opportunities to play alongside adults from a young age (Côté et al., 2003; Côté et al., 2006; Soberlak & Côté, 2003). Several of these factors have previously demonstrated links to expert learning among predominantly male, but also some female athletes (Abernethy, Côté, & Baker, 2002; Baker, Côté, & Abernethy, 2003; Berry & Abernethy, 2009; Côté et al., 2006) and may be more likely to facilitate elite development (Weissensteiner et al., 2009) and sport expertise (Côté et al., 2003).

Contrary to these benefits, several detriments to athlete development have also been considered as a by-product of “rural” early developmental environments. Compared to “urban” areas, small towns may lack facilities, knowledgeable coaches and athlete numbers to create teams, or may only offer limited sports programs due to budget constraints which has shown to be of effect in studies on male athletes (Curtis & Birch, 1987; Lidor et al., 2010). Comparatively, larger cities are less likely to experience these problems, given they can provide children with well-designed and equipped sporting facilities together with easier access to experienced coaches (Lidor et al., 2010).

Despite the availability of sporting facilities, all “urban” citizens may not benefit from their use beyond differences that may exist due to socioeconomic, cultural or gender reasons. Compared to smaller towns, accessing facilities in “urban” areas may be costly and time consuming regardless of gender or age, whilst being associated with greater competition within and between sporting teams (Horton, 2012). Accordingly, young athletes may become a "little fish in a big pond", which creates difficulties in standing out from the
crowd, regardless of gender (Seaton et al., 2009). Furthermore, “urban” adolescents on the whole have greater access to broad recreational interests including part-time work, access to cinemas and shopping malls which will potentially detract from investment in sporting activities, particularly for females (Craike et al., 2011). In turn, when considering several contextual factors it is evident that not all small town environments are advantageous for athletic development nor are all large city environments disadvantageous. This is likely due to a variety of other social, individual and environmental factors influencing these interrelations.

2.3.3.3 “Hotspots” and the influence of local community

From the above discussion, it is evident greater understanding of contextual, geographic and community factors underpinning BPEs is required. Within the context of this study, an attempt will be made to identify a potential Australian Olympic BPE and gain understanding of factors associated with these areas becoming “hotspots” for athlete development; to do so, it is beneficial to explore how certain regions can develop “hotspot” status in academia, sport and the arts over a period of years.

Beyond outcomes of empirical BPE studies, history has demonstrated how social influences can create talent “hotspots” across several domains. Although “hotspot” will be the term used within this study, Coyle (2009) proposed the term “talent hotbed” whose definition is befitting of this project. These terms epitomise a community or region where a particular talent has been consistently produced at a high level and maintained over an extended period.

Occasionally, an individual will be fortunate enough to be born into a family, community or circumstance providing them with unique advantages for developing a particular talent. Famous international examples include Florence’s artistic community during the Renaissance, Brazil’s world-beating soccer players and Australia’s ‘Wagga Effect’, a term coined by the AIS to describe the disproportionately higher number of elite sportspeople deriving from regional cities (Wagga Wagga City Council, 2012). Regardless of size, common to each “hotbed” was its tendency to flourish without warning (Coyle, 2009). Whilst such occurrences may initially appear mysterious, there are always underlying reasons for a concentration of talent within a particular community.

Talent can emerge from countless developmental circumstances and sometimes in the most unlikely of places (Gulbin & Weissensteiner, 2013). Syed (2010) uses his own experiences to explain how a sporting “hotspot” can occur. Raised in an unremarkable English town in a seemingly ordinary family, Syed become a two-time Olympian and
Commonwealth Games table tennis champion. Several environmental factors related to his family, school and community are attributed as being instrumental to his success. Syed’s childhood home and relationship with his brother were considered unique, given they not only shared a passion for table tennis, but also had access to a table built to tournament specifications in the large family garage; something few other children had. Additionally, his primary school teacher was one of the nation’s leading table tennis coaches at that time, and the local table tennis club unusually allowed members 24-hour access to its facilities. Throughout his childhood, streets nearby his school contained a greater number of the nation’s top players than the rest of the country combined.

Similarly, Oakley (2014) recalls how geography and town size in childhood unintentionally influenced his own journey to elite sport. Prior to becoming a World Championships competitor in wind-surfing, Oakley had grown up in a small town, in which he lived 50 metres from the sea. Not only did proximity to this natural facility allow him regular access to a training environment, many other youth in the area were equally interested in and competitive at wind-surfing. Beyond socialisation and fun, these athletes inadvertently motivated each other to continually improve. Collectively, Oakley believed that location, passion and making the most of opportunities were integral components of the community’s contribution to his development. Had he grown up even 10 miles inland within a totally different environment, Oakley believes he would not have had these opportunities or experiences.

To further illustrate this point, in ‘Podium’ Oakley highlights the life histories of several British Olympic champions including Steve Redgrave (rowing), Ben Ainslie (sailing) and Chris Hoy (cycling). Respectively, they grew up beside the River Thames, the ocean and near a velodrome; each of which were key resources required for their sport. Given their proximity, this enabled training to become easier whilst simultaneously placing them in contact with enthusiastic and influential coaches at a local club. In some cases, this provided direct contact to international-level coaches and their local elite training groups, which subsequently created a ‘mini hub of excellence’ (Oakley, 2014). In each case, a confluence of auspicious variables demonstrates how a series of simple, unrelated factors can lead to the development of superior sporting talent.

Internationally, small countries like Curaçao can also be considered a “hotspot”, given its identity as an unlikely destination for Major League Baseball talent to propagate. The availability of few facilities and a comparatively short baseball season (Coyle, 2009), initially appear to place this nation out of “hotspot” contention. Factors that appear disadvantageous however, can contain within them the seed of success, to form a classic
‘David and Goliath’ scenario (Gladwell, 2013). Several factors common to any talent “hotspot” exist within this diminutive Caribbean nation. Coyle (2009) discovered that national motivation and interest in baseball was enhanced when an unknown, rookie Curacaoan player scored two consecutive home runs in the Worlds Series; a moment of ‘ignition’ known to spark “hotspots”. In conjunction, a disciplined culture, talented coaches, supportive parents, national pride, love of the game, continued exposure to the sport and a lot of deliberate practice, led this ‘underdog’ nation to punch above its weight in producing talented baseballers.

Evidently, the underpinnings of “hotspot” success as highlighted by Syed (2010), Oakley (2014), Gladwell (2013) and Coyle (2009) contain within them, several similarities to academic birthplace effect literature. As previously discussed, rural towns and smaller cities can provide a range of advantages for widespread success in athlete development, despite potentially appearing disadvantageous compared to larger cities or other areas. Collaborative approaches to sports participation, closer coach-athlete ties (MacDonald, King et al., 2009), the status of sport as a recreational pastime within communities (Craike et al., 2011), ample access to recreational areas for the population size, greater youth-directed sporting activity (Balish & Côté, 2011) the presence of supportive psychosocial environments (Côté et al., 2006) and possible ‘big fish, little pond effects’ (Marsh, 1987) are all similar factors between these “hotspot” scenarios and existing literature. In broader psychological research, the ‘theory of behaviour settings’ (Barker, 1978) supports the notions of social behaviour that may have occurred in each of the aforementioned birthplace effect and “hotspot” scenarios. In situations with fewer ‘participants’ than optimal, individuals are more likely to undertake a greater variety of roles and apply greater effort, thus leading to higher levels of success or failure depending on the scenario. Collectively, such influencing factors may shed greater light on the emergence of athlete development “hotspots”.

Within educational settings, the Knowledge is Power Program or KIPP academy schools are a classic “hotspot” example. Students from a now famous Year-Eight class from the South Bronx had several factors against them, including being predominantly black or Hispanic, being from low income families and were academic underperformers (Tough, 2013). Students from this class alongside other American KIPP schools went on to gain a reputation as high academic achievers within their cities, with the majority attending college as adults (Coyle, 2009; Tough, 2013). Similar to the sporting context, these successful outcomes were made possible through the social environment within “hotspot” schools. Focus on the development of ‘character’, high standards, attention to detail, deliberate practice, acceptance of mistakes and emphasis on continued improvement were deeply embedded within school culture (Coyle, 2009). Although fundamental to a sporting “hotspot”,
the ingredients for success and the creation of these academic “hotspots” evidently contain a high degree of crossover. Ultimately, such examples demonstrate that a talent “hotspot” can occur in a broad range of physical, political and demographic settings, particularly when several key factors within the broader social milieu are present.

2.3.3.4 Demographics and socioeconomic status (SES)

Conversely, it has been suggested that if particular demographic criteria are not met, success is much less likely to occur. Although simplistic, there are notions that success or failure can pertain to the postcode of an individual's birthplace (Coyle, 2009). Such statements can be interpreted through both a geographic and demographic lens, as an individual’s experiences in sport may be influenced by accessibility to financial resources, the area they reside, the people they live amongst and the government they are directed by (Stoddart, 1986). Availability of influential social networks may allow educated and affluent individuals to access a broader range of opportunities, compared to networks offering fewer resources (Dweck, 2006). Within sport, SES has the beneficial or detrimental ability to influence opportunity, perceptions of destiny and the stress associated with performance and outcomes (Kontos, 2009).

Beyond individual and household SES, community SES can also influence PA and sport participation (Eime, Charity, Harvey, & Payne, 2015). Generally, higher SES correlates with greater sport and exercise participation, as well as moderate-vigorous PA (MVPA) (Eime et al., 2015; Hargreaves, 2007; Kolbe-Alexander, Pacheco, Tomaz, Karpul, & Lambert, 2015). Conversely, low SES youth are more likely to experience physically inactive lifestyles regardless of ethnicity (Martinez, Arredondo, Ayala, & Elder, 2008). Walking, cycling and other vigorous PA is least likely to be undertaken during recreational time by disadvantaged communities both in Australia and overseas (Giles-Corti & Donovan, 2002b; Kolbe-Alexander et al., 2015; Nogueira et al., 2013), although such communities are more likely to engage in these activities for the sole purpose of active transport (Carlson et al., 2014; Goodman, 2013; Rachele et al., 2015; Turrell, Haynes, Wilson, & Giles-Corti, 2013). Factors such as cost, safety, transportation barriers in addition to difficulty in accessing sports programs, facilities or motor vehicles is most likely to influence these movement patterns (Martinez et al., 2008).

Individuals of a high SES not only engage in more PA, but also in more organised club sport (Eime, Harvey, Craike, Symons, & Payne, 2013; Federico, Falese, Marandola, & Capelli, 2013; Steenhuis, Nooy, Moes, & Schuit, 2009), especially in childhood (Kantomaa, Tammelin, Näyhä, & Taanila, 2007; Vandendriessche et al., 2012); thus, resulting in greater
fitness and motor skills amongst youth in this cohort (Klein, Fröhlich, Pieter, & Emrich, 2016; Vandendriessche et al., 2012) which can have implications for athlete development. This situation is known to be particularly relevant to adolescent females, with an Australian study (Eime et al., 2013) reporting the highest levels of sports participation often correlate with affluent, mono-lingual, well-educated, two-parent, Australian-born families in higher SES metropolitan localities, as opposed to rural areas. Such outcomes were most strongly mediated by family support and access to facilities.

Although not immediately apparent, such results could broadly be viewed as positive for early athletic development that takes place in rural areas. Given correlations were not as strong between sports involvement and SES in rural areas, it suggests that participation is still likely regardless of family or community background. Furthermore, as modifiable factors influencing participation and athlete development, family support and access to facilities could be transferable to any area, regardless of demographic. Despite these ideals, Federico et al. (2013) suggests that low SES individuals or communities are likely to face greater economic and cultural barriers, which inhibit accessibility to sport infrastructure. Examples of these barriers are cost, unfamiliarity with facilities and programs, limited social support, unsafe neighbourhoods and restrictions to participation in specific sports dependent upon economic, social and cultural capital (Casey, Eime, Ball, & Payne, 2011; Federico et al., 2013).

Accordingly, the sports individuals participate in are also likely to be heavily influenced by SES. Positive correlations have been found between high SES and participation in sports requiring access to water or snow, expensive equipment, indoor activities (for example, yoga classes or other activities requiring club memberships), racquet sports, martial arts, golf, hockey ‘aesthetic sports’ (for example, gymnastics) as well as ‘niche’ sports (for example, canoeing/kayaking, rock climbing and rowing) (Dollman & Lewis, 2010; Eime et al., 2015; Federico et al., 2013; Kirk et al., 1997). These engagements are often enhanced by the environment in which people live, with individuals of higher SES often residing in safe, aesthetic, PA-friendly environments with easy access to facilities and fewer barriers to participation (Cerin & Leslie, 2008; Eime et al., 2015). This may suggest that participation in junior club-level sport is not an equitable option for all youth (high versus low SES) regardless of talent (Kirk et al., 1997).

Comparatively, the sport choices individuals from low SES backgrounds and communities make are much different, with researchers discovering ‘mainstream’ organised team sports including cricket, netball, Australian rules football (AFL), basketball and football are more predominant, popular and accessible choices. Boxing, fishing, hunting, bowling
and billiards are other favoured activity choices (Eime et al., 2015; Federico et al., 2013). Additionally, low SES athletes are more highly represented in some professional sports (for example, American football, basketball, soccer), which may imply these opportunities are considered a means of increasing social standing (Coakley, 2004; Kuper & Szymanski, 2009). In sports like soccer, individuals of moderate-high SES were found to be under-represented, which may suggest that there is less encouragement in affluent demographics to continue beyond amateur sport. Ultimately, it is evident that individual, family and community factors can underpin socioeconomic inequalities in sports participation (Kamphuis et al., 2008). Therefore, the relationship between sport and regional geography must also be considered when examining the influence of SES upon sports performance and opportunities (Kontos, 2012).

2.3.4 Physical environment

This section encompasses aspects of the built and natural environment, taking into consideration community design, access to facilities, climate and geography. Broader implications of the physical environment for health, lifestyle, PA and sports participation will be discussed, with consideration of their potential implications for athlete development.

2.3.4.1 Community design and access to facilities

The immediate environment in which humans work and live can profoundly influence health and behaviour (Frank, Engelke, & Schmid, 2003; Jackson & Sinclair, 2012). Since the pre-Classical era, it has been known community design and access to facilities can influence individuals and broader communities, as demonstrated by town plans centred around agriculture, the natural environment and community needs (Iyyer, 2009). The implications of city design for health, happiness and holistic wellbeing has been considered since the times of the Ancient Greeks and Romans (Montgomery, 2013) with the harmonious relationship between people and their surroundings being an enduring concern of modern town planning since the early-20th century (Blowers, 2013; Freestone, 2000). Largely, this was in response to health concerns arising from the industrial revolution where overcrowding, pollution, ill health and poor sanitation was common (Yigitcanlar, 2016). In 1898, seminal urban planning theorist Sir Ebenezer Howard initiated the ‘garden cities movement’. This movement aspired to merge the benefits of city and rural living, whilst inspiring a healthier, new way of life (Hutter, 2016).
Initially a garden ‘city’ movement, the greatest impact of Howard’s concept was in the fruition of garden ‘suburbs’. Although not entirely in harmony with Howard’s ideals of a garden ‘city’, the ‘suburbs’ that followed were inspired by this movement (Johnston, 2015). Originating in England, cities and suburbs exemplifying this movement have since become evident across Europe and North America and globally, including in Australia (Jauhiainen, 2013; Karakiewicz, 2015). Key suburban examples within Australia include City Beach (WA), Floreat Park (WA), Wembley Downs (WA), Haberfield (NSW), Dacey Garden Suburb (Daceyville, NSW), Hamilton South (NSW) and Colonel Light Gardens (SA), whilst Canberra (ACT) exemplifies a garden city (Garnaut, 2000; Karakiewicz, 2015; McManus, 2005).

Regardless of locality, town planning based on this movement usually shares common ideals. Fundamentally, the movement considers the social, economic and personal wellbeing of residents as vital, including opportunities which promote fresh air, sunshine, outdoor recreation and proximity to nature as part of a broader agenda supporting public health (Frank et al., 2003). Garden suburbs are designed to be distinct communities, identities and possess similar facilities. Park-like environments are created by the presence of tree-lined streets, internal reserves and with a commitment to preserving natural facilities; such an environment aims to encourage community recreation and outdoor activity. Streets are curvilinear following the contours of irregular land and discourage heavy through-traffic from residential areas to ensure public road safety (Freestone, 1989, 2010; Garnaut, 2000). Although adhering to many British principles, Australia’s inception of the garden suburbs movement is often expressed uniquely. Traditionally, this has been evidenced by the well-documented Australian trend for low-density, detached housing on large quarter-acre lots, which lend themselves to greater yard space (Garnaut, 2000; Halkett, 1976; Kellett, 2011; Timms, 2006).

Beyond the specifics of town planning and locality, the physical environment can have great influence on an individual’s lifestyle and wellbeing. This is partly due to knowledge that design of the built environment can influence public health, PA, air quality, safety, social interaction and other health determinants (Dannenberg & Capon, 2016). Positive associations have been found between the quantity of green space in a living environment where an individual resides and overall perceptions of general health (Kyttä, Broberg, & Kahila, 2012; van den Berg et al., 2015). Furthermore, accessibility to urban green space is reliably correlated with enhanced social support and sense of community among neighbours (Sullivan, 2014). This is unsurprising given the biophilic psyche of human beings, as demonstrated through the inextricable connections humans have historically shared with nature, that are critically important for overall wellbeing and development (Kellert, 2012; Keniger, Gaston, Irvine, & Fuller, 2013; Wilson, 1984). Pertaining to large-
scale sporting events, the concept of ‘sports cities’ (Smith, 2010) and their associated planning has sought to encapsulate some of these proposed benefits. Pye (2015) however posits that the implications of these ideals in planning and their actual influence in practice on public health or social benefit, can be varied or lesser in comparison to sports participation and infrastructure objectives.

Despite this uncertainty around the relationship between physical environment design and implications for public health outcomes, Giles-Corti and Donovan (2002a) propose that physical environments conducive to PA are necessary in assisting communities meet recommended levels of activity. Studies have shown that regular PA takes place more frequently in communities offering free or low cost recreational facilities and open space, compared to areas where higher costs are associated with accessing recreational facilities, and there are fewer open spaces (Gill, 2011; Sallis et al., 2009; Sugiyama et al., 2013; Weimann, Björk, Rylander, Bergman, & Eiben, 2015). Well-designed and attractive parks and neighbourhoods are much more likely to engage residents in PA and sports (Giles-Corti et al., 2005; Kolbe-Alexander et al., 2015), as are proximity and ease of access to recreational facilities; these factors are particularly pertinent for youth (Davison & Lawson, 2006; Markevych et al., 2016; Reimers et al., 2014; Roult, Adjizian, Lefebvre, & Lapierre, 2014). These beneficial sport-PA-environmental relationships also extend to coastal features, which are known to enhance MVPA levels, health, wellbeing and potentially counteract the prevalence of childhood obesity (Ashbullby, Pahl, Webley, & White, 2013; Bauman, Smith, Stoker, Bellew, & Booth, 1999; Wheeler, White, Stahl-Timmins, & Depledge, 2012; White, Alcock, Wheeler, & Depledge, 2013; Wood et al., 2016).

Despite these known benefits, not all communities have equitable access to natural and built facilities due to their geography. Urban, suburban and rural areas provide markedly different living environments and leisure opportunities. For instance, high-density urban areas are more likely to have numerous high quality facilities, yet may experience overcrowding compared to rural areas, whilst newer communities have greater potential to provide attractive facilities (O’Reilly, Berger, Hernandez, Parent, & Séguin, 2015; Rossing et al., 2016; Roult, Adjizian, Auger, & Royer, 2016). Furthermore, residential density, street connectivity, traffic, aesthetics, neighbourhood safety and general access to natural and built recreational facilities (including sports amenities, shops and food outlets), all have potential to assist or deter residents from PA and sport engagement across these different geographic areas (Ball et al., 2007; Kolbe-Alexander et al., 2015; Rodríguez et al., 2012; Siqueira Reis, Hino, Ricardo Rech, Kerr, & Curi Hallal, 2013; Zenk et al., 2009).
Beyond geography, the features of living environments are likely to be attributable to SES and have their own implications for engagement in sport and PA. Compared to higher SES areas, low SES communities are likely to have fewer natural and built amenities which promote PA, alongside smaller availability of free or low-cost recreational facility options (Crawford et al., 2008; Estabrooks, Lee, & Gyurcsik, 2003; Moore, Diez Roux, Evenson, McGinn, & Brines, 2008; Powell, Slater, Chaloupka, & Harper, 2006). Furthermore, whilst some low SES communities have superior access to open space and parks, research has found this is often used in less productive ways than in high SES areas (Giles-Corti & Donovan, 2002a) whereby resident engagement in MVPA has been observed with greater frequency (Veitch et al., 2015). Perceptions of the proximal community environment in which an individual lives being less attractive, unsupportive of walking or cycling and having lower levels of safety with traffic and crime, especially in low SES urban areas, are known contributors to these lower levels of PA (Sallis et al., 2011; Ward Thompson, 2013); thus, demonstrating that community design and SES can have direct implications for PA and possibly sport engagement.

For children particularly, exposure to living environments with these features (usually in low SES communities) can be associated with less outdoor play, reduced social and motor skills alongside smaller social networks (Sullivan, 2014). Dowdell, Gray, and Malone (2011) concur that children especially have increasingly limited opportunities for outdoor play and accessibility to nature due to the ongoing development of cities and subsequent loss of open space. Accordingly, lack of open space and facilities for play may not solely be low-SES dependent, but also a by-product of modern society. Compared to previous generations, children are more likely to have constraints and less time for free, outdoor play (Muñoz, 2009); relevant constraints include over-protective parenting styles, societal aversion to childhood risk-taking, fear of traffic, ‘stranger danger’, local crime and antisocial behaviour, absence of green space close to home, decreases in backyard size and overall less supervision of children due to parents working longer hours (Elliott, 2008; Eyre, Duncan, Birch, & Cox, 2014; Faulkner, Mitra, Buliung, Fusco, & Stone, 2015; Little, 2015; Malone, 2007; White, 2004). Such potential restriction to outdoor activity is concerning, given the importance of immediate surroundings and the backyard as sources of opportunities for children to play in an outdoor environment (Kytta, 2002). Fundamentally, the provision of local, readily accessible spaces allowing children freedom to play outdoors is likely to elicit higher levels of childhood PA (Moore & Cosco, 2010) and may have important implications for athlete development.
Overall, it is clear that early developmental environment can significantly influence childhood PA levels. Accordingly, it can be considered beneficial for athlete development, both directly and indirectly, where communities provide children with opportunities for PA in both the natural and built environment (Kytta, 2002). Amongst multiple factors identified as key to athlete development and the emergence of expertise, ease of access to several recreational facilities and sporting resources is considered essential (Carlson, 1988; Henriksen et al., 2010b; Phillips et al., 2010a; Rossing et al., 2016; Weissensteiner et al., 2009).

2.3.4.2 Climate and geography

Compared to other environmental influences which may influence athlete development, climate and physical geography in relation to their impact on sporting performance and physical activity trends, are less researched. These variables have been found to influence PA patterns in both children and adults across a variety of geographic regions due to seasonal variations. When not excessively high, increased temperatures are known to enhance PA levels, whilst rainfall and cold weather decrease engagement in activity (Duncan, Hopkins, Schofield, & Duncan, 2008; Humpel, Owen, Iverson, Leslie, & Bauman, 2004; Ridgers, Salmon, & Timperio, 2015; Togo, Watanabe, Park, Shephard, & Aoyagi, 2005). Fluctuations in PA are least likely to occur in locations with stable, temperate climates and little seasonal variance (Badland, Christian, Giles-Corti, & Knuiman, 2011).

Variations in PA may also be associated with hours of daylight. Several Australian-focused and international studies have suggested a causal link between daily PA in youth and hours of sunshine, with some research even suggesting daylight saving should serve as a public health intervention to boost PA (Aggio, Smith, Fisher, & Hamer, 2015; Beighle, Erwin, Morgan, & Alderman, 2012; Goodman, Page, & Cooper, 2014; Goodman, Paskins, & Mackett, 2012). Conversely, other studies claim that daylight saving is unlikely to encourage additional participation in MVPA (Zick, 2014). Aside from weather potentially having motivational implications for PA, it is known that human activity trends, health and injury are partially influenced by endogenous circannual cycles (internal human biological rhythms occurring throughout the course of a year) that are dependent upon the bio-climatic environment in which an individual resides (Reilly & Peiser, 2006). Given the inconclusive evidence on the potential of climate to influence PA, it has been suggested that in addition to psychosocial factors (discussed previously in this Chapter), other environmental influences including opportunity and accessibility to recreational facilities, alongside aesthetic attributes in the physical environment may have greater impact on PA (Badland et al., 2011; Humpel, Owen, & Leslie, 2002).
Understandably, many of these factors are applicable to geographic location. Several studies have found that PA levels commonly differ across geographic regions within a nation for a variety of reasons (Bauman, Curac, King, Venugopal, & Merom, 2012; Brown et al., 2013; Craike et al., 2011). Bauman et al. (2012) determined that Australian residents in Melbourne, Brisbane, Perth and Canberra were significantly more active than those in Sydney, Adelaide and Hobart. It was considered this may be due to differences in climate, demography and physical infrastructure (for example, parks, recreational space and footpaths) between the cities. Comparatively, Australian regional variations for sports participation have not been as variable as PA participation trends (Dollman, Maher, Olds, & Ridley, 2012), which may highlight the prominence of sport as a national past-time. When similar research was conducted amongst US cities, it was discovered that dry, moderate conditions were more likely to correlate with meeting PA recommendations compared to residing in moist, tropical conditions (Merrill, Shields, White, & Druce, 2005); similar causal factors for PA may be relevant within an Australian context.

Geography also has implications for sports participation, with sport-environment relationships known to be broad and multi-faceted particularly for outdoor sports (Peiser & Reilly, 2004). Physical environment features can vary according to geography and directly or indirectly influence climate and the experience of engaging in particular sporting activities. Such factors can include: temperature, wind, rainfall, humidity, altitude, soil, air pollution and slopes distinctive to a particular running or cycling course (Bale, 2003; Peiser & Reilly, 2004; Thornes, 1977). Given seasonal or even daily variance may arise from these features, it is evident that climate has the potential to influence sports participation trends, performance, injury and ultimately athlete development.

Furthermore, some sports require ideal weather and environmental conditions and therefore geographic locations before they can take place most comfortably or successfully (Bale, 1989). Stadler (2005) supports these views, claiming that geographic differences in producing certain athlete types is partially due to climatic influences. Using international examples, he suggests a slow-paced sport like baseball may be suited to warm American summers in the midlands, whilst Canadian children grow up playing on snow and ice which lends to their National Hockey League dominance. Similarly, Stoddart (1988) believes an ideal climate has contributed to Australia’s traditional passion for PA and subsequent sporting prowess. Although not directly related to climate, Kenya’s dominance at long-distance running has similarly been attributed to altitude and geography amongst other cultural factors (Ankersen, 2015; Syed, 2010).
Based on these global variations in climate and their suitability for different sports, it is clear such factors are central to hosting large sporting events. Peiser and Reilly (2004) assert that effective planning for any summer Olympics requires analysis of regional climatic variability of potential host cities. In their 108-year analysis of the marathon at the summer Games, they discovered the race had taken place in diverse geographic and climatic settings. In the marathon, elevated air temperatures and humidity were most likely to produce stressful environmental influences adverse to athletic performance as has been found in other studies (Drust, Rasmussen, Mohr, Nielsen, & Nybo, 2005; Sunderland & Nevill, 2005; Zhao et al., 2015). Although all climatic and geographic factors cannot be overcome, technology and increasingly developed built facilities have enabled certain aspects sporting environment to be equitable across regions.

Particularly, this is evidenced through the built surfaces used for facilities in sports including running, hockey and football (various codes). Compared to their natural counterparts, built surfaces contain the benefit of being versatile, durable across climatic conditions and repeat use and are relatively easy to maintain whilst complying with athlete safety and sports performance (Drakos, Taylor, Fabricant, & Haleem, 2013; Stiles & Dixon, 2015; Williams, Trewartha, Kemp, Michell, & Stokes, 2016; Zanetti, Bignardi, Franceschini, & Audenino, 2013). Although holding the potential to enhance sports participation, multiple studies have suggested that artificial surfaces may affect athlete health and performance through injury with greater frequency. Despite becoming more technologically advanced, torque and strain on an athlete’s body may be greater on artificial opposed to natural surfaces and subsequently increase the number of injuries sustained (Dragoo, Braun, & Harris, 2013; Drakos et al., 2013) alongside potentially causing greater muscle soreness and longer recovery times (Poulos et al., 2014; Williams et al., 2016).

Natural surfaces comparatively have their own benefits and limitations. On one hand, sand-based surfaces are considered to limit muscle damage and soreness, but decrease performance capacity due to lower impact forces (Binnie, Dawson, Pinnington, Landers, & Peeling, 2014). Contrastingly, climatic conditions such as drought and hot weather can result in increased athletic injuries due to lack of grass and hard soil surfaces (Orchard, 2002; Orchard, Seward, McGivern, & Hood, 1999). Anecdotally, athletes from various sports report that different ground surfaces will produce varying injury outcomes; however, scientific comparisons between natural running surfaces (for example, grass, soil, gravel and sand) and modern artificial turfs remain inconclusive (Petrass & Twomey, 2013; Stiles & Dixon, 2015). Ultimately, climatic and geographic variables have potential to influence PA and sports participation, alongside sports performance, which highlights the importance of their investigation within the talent development of Australian summer Olympians.
2.4 Conclusion

This chapter provided empirical grounding for the study by critically reviewing academic literature, examining the role of sport and the Olympics in Australian post-settlement history, culture and national identity. Australia’s relationship with the modern Olympic Games since 1896 was also explored, particularly in light of its associations with national pride, sporting heroes and ongoing costs related to maintaining our illustrious summer Olympic history. The latter stages of this chapter critically analysed several individual and environmental factors known to influence athletic development, including the birthplace effect phenomenon which was a key impetus behind and inspiration for this study. Ultimately, individual athletes will have their own complex story shaped by several key episodes, attitudes, behaviours and chance factors which shaped their path to sporting excellence (Oakley, 2014). Discussion of literature across each of these areas, aimed to contextualise the project, as well as highlight key themes requiring further investigation in the following chapters.
Chapter 3 – Theoretical Framework

3.1 Introduction

To allow for a unique and holistic investigation of talent development pertaining to a cohort of 1984-2012 Australian summer Olympians, it is necessary to identify an appropriate theoretical framework; one of the most important considerations in the research process (Gratton & Jones, 2004). It is essential to maintain close relationships between theory, methods and analytic strategy (Guba & Lincoln, 1994; Tudge, 2008), in order to enhance understanding of supporting and non-supporting evidence for the theory (Tudge, Mokrova, Hatfield, & Karnik, 2009).

This chapter explores the chosen research paradigm and describes the appropriateness of a mixed-method (MM), pragmatic approach as the guiding research paradigm for this project. Secondly, it will discuss the evolution of Bronfenbrenner’s ‘Ecological Systems Theory’ (EST) (1979b) and ‘Bioecological Model’ (BM) (1994b; 1998) of human development in light of the work of other scholars. Finally, an explanation will be provided as to how these theories can be practically applied to the study of an Australian sporting “hotspot” and the 1984-2012 summer Olympians whose early development took place within this setting. Collectively, these frameworks were used to address the aims of this study, which were to identify if a “hotspot” of Australian summer Olympians existed and where it was located, followed by investigation of its perceived influence on Olympians who experienced their early athletic development in this environment.

3.2 Research paradigm

Traditionally, two broad approaches to the nature of knowledge have existed, as epitomised by positivist and interpretivist paradigms. Closely associated with quantitative methods, positivism assumes that investigated phenomena can be measured through scientific, objective and empirical means (Gratton & Jones, 2004; Patton, 2015). Social realities are considered tangible through statistical conclusions and exist independently of beliefs, feelings or emotions. Although accommodating for precision, positivism does not enable the meaning of participants’ experiences to be elucidated (Gratton & Jones, 2004; Wilson, 2011). Conversely, interpretivism closely aligns with qualitative research and recognises history, social life and individuals’ unique perceptions of events are central to knowledge. Seldom straightforward, interpretivism by nature leads to questions of validity, reliability and generalisability (Gratton & Jones, 2004; King & Horrocks, 2010; Miles, Huberman, & Saldana, 2014). Interpretivism is however, valued by its ability to affirm the
existence and importance of the subjective (Miles et al., 2014); an important factor to consider in studies such as this, given the potential for athlete development to be influenced by several external social forces, which casual relationships cannot make evident (Gratton & Jones, 2004).

Neither of these paradigms alone however, effectively met the requirements of this mixed-methods (MM) project. A MM, quan →QUAL (quantitative → QUALITATIVE) design (Creswell, 2014; Morse, 1991) was deemed necessary to identify a “hotspot” of 1984-2012 Australian summer Olympians and gain an understanding of factors associated with their development. In summary, this modelling highlights the greater weighting of qualitative data within this MM study, preceded by a comparatively smaller, yet necessary, quantitative component of data collection. Fundamentally, utilising a MM approach enables a plurality of philosophical paradigms, theoretical assumptions, methodological traditions, data collection and analysis techniques to be sourced to clarify realities of the social world (Greene, 2007). The outcomes are also likely to be superior to utilising qualitative or quantitative paradigms alone (Johnson & Onwuegbuzie, 2004; Tashakkori & Teddlie, 2010), as MM approaches provide a well-connected overview of a phenomena. This is made possible through highlighting the contributions of both paradigms, whilst simultaneously overcoming their weaknesses (Patton, 2015; Wilson, 2011). Accordingly, this can facilitate enhanced strength, credibility and triangulation of the research findings to occur (Creswell, 2014; Mertens & Hesse-Biber, 2013).

Consequently, utilising a MM approach inherently aligns itself with a pragmatic paradigm (Creswell, 2014; Patton, 2015; Rossmann & Rallis, 2011; Tashakkori & Teddlie, 2010). Pragmatists argue that a false dichotomy exists between qualitative and quantitative research (Newman & Benz, 1998) and have promoted the use of MM due to beliefs that epistemological purity encourages research inefficiency (Creswell, 1995; Miles & Huberman, 1984). Accordingly, pragmatism enables practical application of both qualitative and quantitative methods in order to meet a study’s needs, alongside gaining a deeper understanding of social phenomena and experiences beyond traditional understandings of reality (Morgan, 2014; Sieber, 1973; Tashakkori & Teddlie, 2003; Wilson, 2011). Therefore, through using a pragmatic paradigm, concrete real-world issues can be understood so that practical actions can be developed for the future (Patton, 2015).
Elite and Olympic sport is an expensive outlay in Australia, particularly with increasing global competition for, and cost associated with, Olympic medals (Rees et al., 2016). Given the intentions of this study to identify a “hotspot” of Australian Olympians alongside understanding its occurrence and influence on athlete development, it is evident from the above discussion utilising a MM, pragmatic approach was essential to gaining full understanding of this phenomenon.

3.3 Bronfenbrenner’s theories

This project was conducted within the framework of the EST (Bronfenbrenner, 1979b, 1988) and BM (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998), due to their ability to elicit deep understandings of social experiences according to a pragmatic paradigm. Bronfenbrenner’s theories of human development have undergone continual evolution since their inception in the 1970’s, which has resulted in researcher confusion and often inadequate testing of their ideals (Tudge et al., 2009).

3.3.1 ‘Ecological systems theory’ (EST)

Bronfenbrenner’s EST (1979b) is reinforced by his earlier child development work and focuses on an ecological approach to human development. Lewin’s (1935) formula was instrumental in founding the EST and its notions of human behaviour and development being joint functions arising from person-environment interactions (Bronfenbrenner, 1992b). From this perspective, human development is viewed as a process of systematic change, arising from fluid relations between the developing individual and their surrounding environment (Lerner, Brown, & Kier, 2005). Like Vygotsky, Bronfenbrenner acknowledged the variability of a child’s development and its dependence upon exposure to culture and historical time periods through the era in which they lived (Bjorklund & Blasi, 2012).

A key influence to the EST’s development was Bronfenbrenner's recognition that laboratory studies were artificial and inadequate for studying developmental settings and relationships most familiar to children (Rosa & Tudge, 2013). Conducting research in unfamiliar locations with researchers unknown to the child (Bronfenbrenner, 1973, 1977a) placed little emphasis on humans’ lived context (Bronfenbrenner, 1979a), or their subjective, phenomenological perspectives of the world (Bjorklund & Blasi, 2012) and subsequently raised issues around research validity (Bronfenbrenner, 1973). Accordingly, Bronfenbrenner argued that human development studies should take place in-context and directly examine individual-environment interactions whereby the environment is viewed as a series of nested structures, akin to a set of Russian (matryoshka) dolls (Bronfenbrenner, 1977b, 1979b, 2005c).
The EST is fundamentally organised as four interconnected structures of increasing hierarchy, with those proximal to the developing individual being enclosed within those more distal (Bronfenbrenner, 1979b). Collectively, these systems reflect a child’s psychosocial environment (Wachs, 2015), with the changing interactions between different contexts having developmental consequences for the individual, the types of activities they engage in and the social structure around them (Bronfenbrenner, 1977b). Adapting Brim’s (1975) terminology, Bronfenbrenner conceived these four systems as the *microsystem*, *mesosystem*, *exosystem* and *macrosystem*. The *chronosystem* was later added to complement the existing systems (Bjorklund & Blasi, 2012; Bronfenbrenner, 1988). An illustration of the interrelationships between these systems can be viewed in Figure 3.1.

![Figure 3.1 Bronfenbrenner’s (1979, 1988) Ecological Systems Theory](image)

The most proximal level to the individual, the *microsystem* comprises the social systems an individual regularly experiences, including the home, family and school environments, with particular reference to relationships, activities and roles experienced within these settings. Environmental influences from higher levels are filtered through to this level where direct, face-to-face experiences take place. Closely related to the *microsystem* is the *mesosystem* which consists of the interrelations between at least two of the *microsystems* in which the developing individual participates, such as family-school-peer interactions. Rather than simply combining or averaging *microsystem* influences, these interrelationships are dynamic and can contribute to analysis of *mesosystem* influences being the most complex. Social environments which individuals are not directly part of, are called the *exosystem* and can still influence development formally or informally. This may include their parent’s work place, teacher’s home life, media influence, government agencies, law enforcement, neighbours, local community structure and societal policies.
Macrosystem influences are most distal to the individual and refer to broader cultural patterns of the society in which they exist. This system includes economic, social, education, legal and political systems and is characterised by an overarching belief system whose members share values, resources, lifestyles, opportunity structures, life course options and patterns of social interchange. The character of micro, meso and exo-systems are tangible manifestations of macrosystem influences and may be attributable to children from sub-cultural groups based on SES, ethnicity or religion developing similarly (Bjorklund & Blasi, 2012; Bronfenbrenner, 1976, 1977b, 1977c, 1993; Rosa & Tudge, 2013; Spencer, 2006; Tudge et al., 2009).

Externally, the chronosystem extends across the four systems in order to demonstrate that each individual and level of ecology will change over time (Bjorklund & Blasi, 2012; Wachs, 2015). It is viewed in terms of key events at different life stages, or the encounter of macrosystem factors and historical events at a particular age (Elder & Shanahan, 2006; Wachs, 2015). Such events may be external (for example, the birth of a sibling), internal (for example, beginning puberty or falling ill), expected (for example, starting school) or unexpected (for example, sudden death or serious illness of a family member) (Bronfenbrenner, 1988, 1992b; Rosa & Tudge, 2013). Broader historical events can influence development throughout the lifespan including: the Great Depression (Elder, 1974); WWII and subsequent patterns of child rearing (Bronfenbrenner, 1958); and more recently, the South-East Asia 2004 Christmas tsunami (Bjorklund & Blasi, 2012). This is due to the widespread social changes and cohort effects they produce, influencing a generation of children. Less radically, cohort effects can also be reflected in changing cultural values including high numbers of stay-at-home mothers throughout the 20th century or children’s increasing utilisation of technology over time (Bjorklund & Blasi, 2012). Chronosystem events alter pre-existing person-environment relationships and create dynamics which potentially instigate developmental change (Bronfenbrenner, 1989a) amongst humans who, for better or worse, are active producers of their own development (Bronfenbrenner, 2005c).

Although Bronfenbrenner’s earlier work focused significantly on developmental context, individuals were always considered crucial to their own development (Rosa & Tudge, 2013). This became increasingly important in the following decades when he began to acknowledge research focused excessively on developmental context (Bronfenbrenner, 1986), with greater emphasis needing to be placed on the developing individual (Bronfenbrenner & Morris, 1998). Accordingly, several changes were made to the EST throughout the 1980’s and 1990’s, which led to the evolution of the BM as it stands today (Rosa & Tudge, 2013; Tudge et al., 2009).
3.3.2 ‘Bioecological Model’ (BM)

Whilst the EST focuses on characterising person-environment relationships as a series of dynamic and interactive systems, the BM highlights the relationships between heritability, genetic influences, proximal processes (discussed in detail later in this section), individuals’ personal characteristics and relations with others, taking place in specific environments over time and during a particular historical period (Rosa & Tudge, 2013; Spencer, 2006). Particularly, the BM observes the way in which these relationships can interact to influence an individual’s development. The BM is known as a living system because it incorporates individual biology through to the broadest levels of human development in light of the external environment, as a constantly evolving scientific theory (Bronfenbrenner & Morris, 2006; Ford & Lerner, 1992; Lerner, 2005). Incorporating greater focus on aspects of an individual’s biology, the BM aims to address the contribution of heredity and environment to development and identify mechanisms through which genotypes can be transformed into phenotypes (Anastasi, 1958; Bronfenbrenner & Ceci, 1993).

To understand the BM’s broader philosophies and subsequent research applications, it is essential to consider three Propositions which specify the model’s defining properties. Theoretically interdependent, Propositions I and II are subject to empirical test through the Process-Person-Context-Time (PPCT) model as the BM’s operational framework (Bronfenbrenner & Morris, 1998). The PPCT will be discussed in due course with practical application and reference to the Propositions.

**Proposition I:** Especially in its early phases but also throughout the life course, human development takes place through processes of progressively complex reciprocal interactions between an active, evolving bio-psychological human organism and the persons, objects and symbols in its immediate (proximal) external environment. To be effective, the interactions must occur on a regular basis over extended periods of time. Such enduring forms of interaction in the immediate environment are referred to as proximal processes (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998).

Examples of enduring patterns of proximal processes include playing with a young child, learning new skills, athletic activities, performing complex tasks, problem solving and acquiring new knowledge (Bronfenbrenner, 2005a; Bronfenbrenner & Morris, 1998; Tudge et al., 2009). Fundamentally, these processes serve to attract and sustain a developing individual’s attention, initiate new challenges within the zone of proximal development and accumulate and refine specialised knowledge (Bronfenbrenner & Ceci, 1994; Chi & Ceci,
The influence of these \textit{proximal processes} on development can be understood through the ideas conveyed in Proposition II.

\textit{Proposition II:} The form, power, content and direction of the \textit{proximal processes} affecting development vary systematically as a joint function of the characteristics of the developing \textit{person}; of the \textit{environment} - both immediate and more remote - in which the \textit{processes} are taking place; the nature of the \textit{developmental outcomes} under consideration; and the social continuities and changes occurring over \textit{time} through the life course and the historical period during which the person has lived (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998).

Propositions I and II promote a dynamic, person-context view of human development, in which individuals are portrayed as agents in development through a synthesis of the active person and their dynamic context (Bronfenbrenner & Morris, 1998; Lerner, 2005). Specifically, the \textit{PPCT} model manages the interrelations among key concepts underpinning these Propositions and was inspired by other researchers' work, which Bronfenbrenner adopted at various stages throughout the model's evolution (Rosa & Tudge, 2013).

Whilst Lewin's (1935) work was influential in the development of the EST, it was the later work of key researchers who motivated the BM's development towards \textit{PPCT} concepts. Drillien's (1957, 1964) research instigated Bronfenbrenner to direct focus towards a \textit{Process-Person-Context} model whereby \textit{proximal processes} were deemed the most powerful predictor of human development (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006). Vygotsky (1929) and Luria (1979) further bolstered Bronfenbrenner's views of human development as an ongoing process whereby variations in developmental outcomes can be attributed to cultural influences on individuals over time (Rosa & Tudge, 2013). Finally, Elder's (1974, 1985) work demonstrated clear impacts of historical time on development over the lifespan and inspired Bronfenbrenner to incorporate the concepts of \textit{chronosystem} and \textit{time}. Stimulated by this existing research, four \textit{PPCT concepts} are fundamental to the most mature version of the BM and must be considered in its utilisation in order to provide adequate data for understanding human development (Lerner, 2005; Tudge et al., 2009).

Encompassing the first of these concepts, \textit{process} is integral to human development and philosophies of the BM (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Evans, 2000; Bronfenbrenner & Morris, 2006). In changing from an ecological to a bioecological theory, Bronfenbrenner expounded an individual's role in their own development through \textit{proximal processes} (Bronfenbrenner & Evans, 2000; Rosa & Tudge, 2013; Tudge et al., 2009). Tudge et al. (2009) suggest that engagement in \textit{proximal process} activities can allow developing
individuals to make sense of and understand their place in the world. When occurring effectively and consistently, *proximal processes* are considered to positively influence developmental outcomes through promoting competence and diminishing undesirable outcomes (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006). Positive outcomes of *proximal processes* are considered strongest in advantaged, stable environments in contrast to those that are disadvantaged or unorganised. Furthermore, quality *proximal processes* are deemed to significantly reduce developmental differences associated with SES, family structure and other negative outcomes related to unstable environments (Bronfenbrenner & Ceci, 1993).

*Proximal processes* can also serve as a vehicle through which genetic potential (genotype) can be actualised into observable phenomena (phenotype) in order to improve an individuals’ developmental functioning. Based on theories of genetic transmission (Bronfenbrenner & Ceci, 1994), processes which mediate genetic and environmental influences on human development are fundamental to the BM (Bronfenbrenner & Ceci, 1993; Spencer, 2006). These theories comprise the idea that genetic material alone does not produce complete traits; rather, interactions between genetics and environmental experiences ultimately determine developmental outcomes (Albersch, 1983; Gottlieb, 1991, 1992). Such relationships can be used to describe the role *proximal processes* play in actualising genetic potential and how this influences effective development, as outlined in Proposition III.

**Proposition III: Proximal processes** serve as a mechanism for actualising genetic potential for effective psychological development, but their power to do so is also differentiated systematically as a joint function of personal characteristics, environmental factors and the nature of the developmental outcomes under consideration, the same three factors stipulated in Proposition II (Bronfenbrenner & Ceci, 1994).

Accordingly, the influence of *proximal processes* on individual development are variable. Consequently, it can be inferred that the realisation of human potential requires the intervention of *proximal processes* to connect the inner (i.e. personal characteristics, genetics) with the outer (i.e. environment) through a bi-directional process occurring over an extended period of time (Bronfenbrenner & Ceci, 1994).

Although environmental factors substantially influence *proximal processes* (Bronfenbrenner, 1986, 1989b, 1992a), genetic influences must also be acknowledged within the BM (Bronfenbrenner & Ceci, 1993). Therefore, to understand the power and expression of *proximal processes* in human development contexts, both genetic potential and heritability will be discussed. Heritability can be described as the ratio of variance
attributable to actualised genetic potential, as opposed to simple genetic influences that typically vary according to the quality of proximal processes and developmental environment characteristics (Bronfenbrenner & Ceci, 1994; Spencer, 2006). Variations in population traits are due to both biological (nature) and environmental (nurture) factors (Wray & Visscher, 2008), with the concept of heritability highlighting the extent to which population differences can be attributable to genetic or non-genetic factors (Irvin, 2015; Wray & Visscher, 2008). Alterations to heritability can however occur without genetic change, such as when the environment begins contributing more to variation (Hughes & Townsend, 2013). In summary, phenotypes, or observable traits, can be modelled as the sum of environmental and genetic influences. For instance,

“Phenotype \( P \) = Genotype \( G \) + Environment \( E \)”

(Irvin, 2015, p. 17; Kempthorne, 1957)

Bronfenbrenner and Ceci (1993) support these ideas by arguing heritability \( (h^2) \) (as outlined in the aforementioned modelling concept) is known to vary considerably as a direct outcome of the quality of proximal processes and the environment in which they occur. They postulated that enhancing the quality of proximal processes and the environment in which they take place leads to higher levels of heritability and enhanced developmental functioning (Bronfenbrenner & Ceci, 1994). These outcomes can be heightened if they occur amongst people who have developed strong emotional relationships (Bronfenbrenner, 2000, 2001; Bronfenbrenner & Morris, 2006). Given that development does not occur in a vacuum, these views highlight that individual developmental outcomes are not genetically predisposed, but are capable of alternative expression, depending on the environment and people they are exposed to (Bronfenbrenner & Ceci, 1994).

Despite acknowledging individual genetics (Bronfenbrenner 2005c; Bronfenbrenner & Ceci, 1994), Bronfenbrenner placed greater emphasis on what an individual’s personal characteristics brought into social contexts (Bronfenbrenner & Morris, 1998; Tudge et al., 2009). Relating to the second \( P \) in the PPCT model, person characteristics (demand, resource and disposition) contain potential to influence development and proximal processes throughout an individual’s lifespan.

Readily observed, demand characteristics act as a personal stimulus to invite or discourage reactions from the social environment, which accordingly influence the operation of proximal processes (Bronfenbrenner & Morris, 1998; Rosa & Tudge, 2013; Tudge et al., 2009) and encompass age, gender, skin colour, attractiveness and temperament (Bronfenbrenner & Morris, 2006). Resource characteristics are comparatively less apparent,
yet can influence individuals’ ability to engage in proximal processes (Bronfenbrenner & Morris, 2006; Tudge et al., 2009). Bioecological resources including ability, experience, knowledge and skill may prove advantageous, whereas genetic, physical and mental defects potentially impede the effectiveness of proximal processes (Bronfenbrenner & Morris, 1998, 2006). Access to social and material resources like nutritious food, housing, caring parents and adequate educational opportunities (Tudge et al., 2009), are other personal resources which may influence development and proximal processes. Finally, disposition or force characteristics are considered most influential in determining developmental outcomes as they relate to temperament, motivation and persistence, which can bring either generative or disruptive forces to proximal processes. Generative force characteristics include curiosity, tendencies to initiate or engage in independent or team activities and the ability to delay gratification to pursue long-term goals. Alternatively, impulsiveness, apathy, inattentiveness and the inability to delay gratification, may be disposition characteristics which disrupt development (Bronfenbrenner & Morris, 1998, 2006).

Whilst of prominent focus within Bronfenbrenner’s earlier EST theory (Bronfenbrenner, 1977c, 1979b), the environment or context received comparatively less attention within updates to the BM (Rosa & Tudge, 2013). Context however, remains an integral component of the BM, due to the interrelation between context and proximal processes and the various interactions which take place across varying levels of environmental influence (Bronfenbrenner & Morris, 1998, 2006).

Crucial to any human development theory, the final element of the PPCT model is time (Tudge et al., 2009), which incorporates both ontogenetic (lifespan) and historical (era in which a person lived) time (Rosa & Tudge, 2013) to build upon earlier chronosystem concepts. Bronfenbrenner and Morris (2006) propose that time constitutes three dimensions: micro-time (continuity or discontinuity of episodes within proximal processes); meso-time (extent to which activities and interactions occur with consistency in the developing individuals environment over days and weeks); and macro-time (equivalent to the chronosystem, it encompasses changing expectations and events in broader society, both within and across generations and relates to how historical events can influence an individual’s development) (Bronfenbrenner & Morris, 2006; Tudge et al., 2009). Given all aspects of the PPCT model can be thought of in terms of relative constancy and change, both time and timing are equally important. For this reason, Bronfenbrenner maintained that individual developmental experiences are embedded in and shaped by events occurring during the historical period of their life (Bronfenbrenner, 1995, 1999). Ultimately, the PPCT model acknowledges that human developmental outcomes are dependent upon dynamic
and bi-directional individual-context relationships over an extended period of engagement in key processes and activities.

3.3.3 'Ecological Systems Theory' and 'Bioecological Model': practical applications

This section will discuss the practical application of the EST and BM within the conceptualisation, undertaking and analysis of this project which aimed to identify and investigate a “hotspot” of 1984-2012 Australian summer Olympians. The EST was predominantly utilised across Studies 1 and 2, while the BM was incorporated as a lens for the combined interpretation of results and discussion in Chapter 7.

The EST was the predominant theoretical framework within this study, as it allowed for the broader “hotspot” context to be investigated at varying levels encompassed by the micro, meso, exo and macro-systems, especially in Study 2. Study 1 was comparatively exosystem focused, through investigating demographic and environmental variables. Incorporation of the chronosystem in Study 2 allowed for the influence of historical time-periods and key events to be considered in the role their interactions played in the broader “hotspot” context. Although the project’s timeframe was 1984-2012, earlier events which potentially exerted influence were also noted. Although context was a key focus, the role of the individual was not overlooked, as the EST provided flexibility to consider the views of several types of stakeholders within the “hotspot”, including junior and senior elite athletes, their coaches and parents, club committee members, high performance sports administrators, mayors, a parent of an Olympian and Olympians themselves. Visual representations of the varying levels of the EST and a flow chart demonstrating the key objectives of Study 1 and 2 can be found in Figure 3.1 and 4.1 respectively.

In part, the EST's utilisation was founded on previous studies (Balish, 2011; Carlson, 1988; Henriksen, 2010) which also drew upon Bronfenbrenner’s (1979b, 2005a) framework to research athlete talent development environments. Originally designed to research human development more broadly, factors contained within each level of the EST were adapted to suit the needs of this sports-related research. For example, ‘community sports clubs’ were added as a key element in the microsystem, ‘access to built and natural facilities in the “hotspot” was incorporated into the exosystem, whilst ‘norms and values of the culture’ within the macrosystem was adapted to ‘role of the Olympic and sport in Australian national identity’.
Several contextual factors investigated in this study pertain to the EST’s *exosystem* level as it relates to the broader “hotspot” and the ways in which this community may have directly or indirectly influenced early athletic development. Additionally, *exosystem* influences can be observed and experienced by several individuals from the “hotspot” and not just Olympians themselves. These influences were integral to Study 2, which focused on both Olympians’ and community perceptions of the “hotspot’s” contribution to Olympians’ early athletic development and subsequent sporting success.

Although the EST historically acknowledged an individual’s role in their own development, the BM and its associated *PPCT* model place greater emphasis on personal traits, genetics and engagement in key activities (*proximal processes*) as vehicles for development. Accordingly, components of the BM were adopted to supplement the EST within Chapter 7’s combined interpretation and discussion of results. As Tudge et al. (2009) suggest, integration of these frameworks is not uncommon with researchers adopting Bronfenbrenner’s work, often using earlier versions of his theory as their framework, or alternatively, basing their study on only some of the BM’s major concepts. They do argue however, that researcher transparency around the selection and application of Bronfenbrenner’s work remains crucial to both the theory’s integrity and the broader research field in which it is utilised. Accordingly, clarity around the BM’s use as a supplement to the EST will be applied through discussion of the following four *PPCT* concepts.

As discussed in the previous section, *proximal processes* including athletic activities, performing complex tasks, problem solving alongside learning new skills and knowledge, are key to philosophies underpinning the BM and mechanisms for human development (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Evans, 2000). Several of these *proximal processes* exemplify factors which could be interpreted as key drivers to Olympians’ personal and athletic development. For clarity, ‘athletic activities’ (training and competition pertaining to an athlete’s sport) refers to the *proximal process* identified as being most appropriate for discussing this BM concept within this study.

This is considered an appropriate interpretation of *proximal process*, given the BM stipulates such activities must take place regularly, over an extended period of time and become increasingly more complex in order to influence development (Bronfenbrenner & Morris, 1998). As a *proximal process*, ‘athletic activities’ must possess such features during early development in order to ensure an athlete’s successful long-term athletic development into an Olympian. Furthermore, moderating factors specified in Proposition II including personal characteristics and environment can also influence the nature, timing and effectiveness of *proximal processes*. Interactions with the athlete’s entourage can ensure
proximal processes are developmentally effective through being bi-directional and occurring in supportive settings, amongst emotionally supportive relationships (Bronfenbrenner & Ceci, 1993; Bronfenbrenner & Morris, 1998). Accordingly, investigating the influence such contextual factors may have on ‘athletic activities’ and holistic athlete development were necessary within this study.

Contrary to the BM’s recommendations however, the influence of proximal processes upon the actualisation of genetic potential was not investigated. This study aimed to explore perceptions of individual and environmental factors which may influence athlete development, with the scientific measurement of genotype and heritability not viable within this research. Although not of specific focus, genetics and heritability were discussed generally in Study 2 and in the broader interpretation of results in Chapter 7; this was because of existing knowledge that several physical and psychological factors considered essential to the acquisition and demonstration of high performing athletic ability contain genetic links (An et al., 1999; Baker, 2012; Bouchard et al., 1999; Bouchard et al., 1998; Keller, Bouchard, Arvey, Segal, & Dawis, 1992; Tucker & Collins, 2012b).

Figure 3.2 shows an adaption of Irvin’s (2015) and Kempthorne’s (1957) equation to suit this project:

\[
\text{Superior athletic ability (Olympian)} = \text{Genetics} + \text{Early development context}
\]

\[
\text{[Phenotype]} \quad \text{[Genotype]} \quad \text{[Environment]}
\]

‘Athletic activities’

\[
\text{[Proximal process]}
\]

Developing individual’s lifespan

\[
\text{[Time]}
\]

*Figure 3.2 Adaptation of Irvin’s (2015) and Kempthorne’s (1957) equation*

Although it is acknowledged that genetics play an undeniable role in athletic development through nature-nurture interactions, greater attention was given to the “hotspot” context and its associated environmental influences, which potentially led to abundant expressions of the ‘superior athletic ability’ phenotype within this community.
Person characteristics were integral to Study 2 as they illustrated how Olympians’ personal traits interacted with the environment to influence athletic development. Disposition characteristics were of key interest given their relationship to temperament, motivation and persistence (Bronfenbrenner & Morris, 2006), all of which have potential to initiate and sustain proximal processes (Bronfenbrenner & Morris, 1998). Resource characteristics including access to caring parents, nutritious food, housing and adequate educational opportunities (Tudge et al., 2009) were also considered, as they closely relate to family influence at a microsystem level and the broader demographic of Olympians’ early developmental environment at an exosystem level. Allowing Olympians’ to reflect upon their temperaments and context of early development sought to illicit how both disposition and resource characteristics can influence athletic development. This is vital given developmental trajectories and subsequent success can differ due to personal characteristics, equal to other environmental influences (Tudge et al., 2009).

Although demand characteristics including age, gender, skin colour and physical attractiveness are readily observable and able to influence proximal processes, such traits cannot be objectively measured in light of how they may influence others’ perceptions or actions towards the developing individual for better or worse. Furthermore, these interactions and influences are difficult to observe in retrospective studies. Observation of demand characteristics was therefore omitted from this study because it would be impossible to validly determine their influence on Olympians’ developmental trajectory.

The inclusion of context was necessary, in keeping with the ideologies of both the EST and BM, alongside this study’s focus on broader environment influences on athletic development. Exploration of the “hotspot” at the micro, meso, exo and macro-system levels allowed for comparisons to be made between Olympians’ and community perceptions of the “hotspot” and provided an opportunity to determine the contextual factors most likely to have influenced Olympians’ early athletic development.

Finally, the concept of time was also addressed within this project. The BM encompasses both ontogenetic and historical time (Rosa & Tudge, 2013), with the inclusion of micro, meso and macro-time. Micro-time considers continuity or discontinuity of events within proximal processes, whilst meso-time encompasses interactions occurring in a developing individual’s environment over days or weeks (Bronfenbrenner & Morris, 2006). Similar to other research, investigation of these time dimensions was impracticable due to the retrospective nature of this study (Riggins-Caspers, Cadoret, Knutson, & Langbehn, 2003) and the inability to accurately observe the regularity of early developmental events within Olympians’ lives. Macro-time however, encompasses broader historical events that
have the potential to influence an individual’s development. This concept most closely relates to the chronosystem and for clarity ‘chronosystem’ was the operational term used, given the dominance of the EST within this project.

Adopting Bronfenbrenner’s EST and BM as the guiding frameworks for this study was appropriate for several reasons. Fundamentally, this research sought to explore both individual and environmental factors which may influence Olympians’ early athletic development. Bronfenbrenner’s theories enabled investigation into these factors, alongside recognition that key events and historical periods throughout an individual’s lifespan can also influence development. Additionally, consideration of how proximal processes including ‘athletic activities’ can catalyse development, was integral to a well-rounded understanding of Olympians’ early development and how these experiences can drive subsequent success. When combined with suitable methods, these frameworks facilitated a holistic investigation of an Australian sporting “hotspot” and the associated early development of Olympians.

3.4 Conclusion

In summary, this chapter sought to describe the appropriateness of a MM, pragmatic approach as the guiding research paradigm for this project. Secondly, it discussed the evolution of Bronfenbrenner’s EST and BM of human development in light of the work of other scholars. Finally, justification was provided regarding the appropriateness of these chosen theories for the project, with inclusion of their practical application to the study of an Australian sporting “hotspot” and the 1984-2012 summer Olympians whose early development took place within this setting. This explanation included consideration of how the implementation of the BM particularly, would be modified to suit the unique requirements and possible constraints of this study. The following chapter outlines and justifies use of the chosen research methods used to support investigation within this study through the lens of Bronfenbrenner’s theories.
Chapter 4 – Methodology

4.1 Introduction

This chapter outlines the key research questions guiding this project alongside the research design, data collection and analysis methods utilised to address them. Collectively, the chosen methods were implemented across two separate, yet inextricably connected studies. Utilising a mixed-methods (MM) approach allowed for a “hotspot” of 1984-2012 Australian summer Olympians to be identified, followed by an investigation of Olympians’ and community perceptions regarding the influence of the “hotspot” on early athletic development. The final section of this chapter outlines a review of strategies used to establish trustworthiness within this MM project, with ethical considerations discussed throughout where relevant.

4.2 Aims of this study and key research questions

The aims of this study were to:

1. Identify if and where a “hotspot” of Australian summer Olympians existed, and place it in an Australian context; and
2. Investigate the influence of the “hotspot” on Olympians who experienced their early athletic development in this environment, as perceived by the Olympians themselves and the “hotspot” community.

These aims were achieved by undertaking two studies, which sought to answer the following three research questions:

1. Which Australian Local Government Areas (LGAs) comprise a “hotspot” area for 1984-2012 Australian summer Olympic representatives and how does the “hotspot” compare demographically and climatically to other Australian areas? (Study 1);

2. What are the community’s perceptions of how the “hotspot” was created and how influential do they think this early developmental environment was to the subsequent sporting success of local Olympians? (Study 2); and

3. How do Australian Olympians retrospectively perceive the influence of the “hotspot” and its contribution to their early athletic development and subsequent sporting success? (Study 2).
Figure 4.1 provides an overview of the two sequential and interrelated studies which comprised this project.

Study 1 was conducted in two parts, which aimed to quantitatively answer the “which” question regarding the geographic identification of an Australian “hotspot” and “how” this “hotspot” is comparable to a broader Australian context. It identified the geographic location of a “hotspot” for the Study 2 case analysis, which investigated Olympians’ and community perceptions of the “hotspot”. The results of Study 2 would determine the perceived factors most likely to have contributed to the “hotspot’s” existence and the subsequent developmental implications this had for Olympians whose early development environment (EDE) was located in the “hotspot” area.

4.3 Research design

A MM, quan → QUAL design (quantitative → QUALITATIVE) (Creswell, 2014; Morse, 1991) was utilised to conduct a case study analysis of an Australian sporting “hotspot” across two separate studies. This methodology was deemed appropriate given the retrospective nature of the study meant it was not possible to manipulate participant behaviour and due to contextual conditions being relevant to the phenomenon under study (Yin, 2014). Furthermore, this methodology relates to the philosophical parameters of Bronfenbrenner’s theories which proposed human development research should take place in context and examine the fluidity of individual-environment interactions in an ecologically sound manner (Bronfenbrenner, 1979b; Lerner et al., 2005).

Accordingly, undertaking a case study approach was most appropriate for a MM study. Case studies incorporate multiple data sources to explore a phenomenon, therefore allowing investigation of issues through more than one lens (Baxter & Jack, 2008; Yin, 2014). Subsequently, this allows for both methodological and data triangulation to occur, improving the validity and reliability of findings (Burns, 2000; Patton, 2002). As with any
methodology however, case study approaches may have limitations. Despite providing robust and reliable data, case studies can be expensive and time consuming (Baxter & Jack, 2008). Regardless, incorporating a case study into the research design of this project was deemed valuable in the process of building understanding around a phenomenon in its natural context. Through taking a MM approach in the use of this methodology, multiple quantitative and qualitative methods were utilised to address the study's aims and research questions.

4.3 Study 1 - Identifying and situating the “hotspot” in an Australian context

Study 1 aimed to identify a “hotspot” of 1984-2012 Australian summer Olympic representatives relative to population size (per 100,000). This historical period was chosen as 1984 was the first summer Olympic Games Australia competed in following the 1981 inception of the Australian Institute of Sport (AIS); the nation’s first designated sporting institute. The purpose of Study 1 was to quantitatively determine the location and context of the case study site and then triangulate the results of Study 2. Two sets of data collection and analysis will be separately outlined, due to the sequential nature in which they were used within Study 1.

4.3.1 Data collection

4.3.1.1 Internet and archival data collection

4.3.1.1.1 Identifying the "hotspot”

Internet and archival data collection were integral for the collection of biographic, demographic and climate data for all known Australian Olympians (n = 2160) who qualified for a summer Olympic Games between 1984 and 2012; the cohort nominated for this study. Internet data collection has the advantage of allowing broad information about large sample populations to be collected through fast, cost-effective means (Best & Krueger, 2004; Waltz, Strickland, & Lenz, 2010). Archival sources are a similarly cheap method of obtaining pre-existing data without the need to recruit participants (Jackson, 2015; Timothy, 2012).

Biographic data on 1984-2012 Olympians' birthplace/known area in which they were raised, junior sports club/s and schooling (high and primary where possible) was collected, alongside name, gender, date of birth (D.O.B), sport and highest place at a Games. The criteria used to select athletes for this study were: their name was on an Australian Olympic Committee (AOC) team list(s); athletes who withdrew from the team due to injury and personal reasons; or who were a reserve for an Olympic team, verifiable through their National Sporting Organisation (NSO). Even if they did not compete, these athletes demonstrated ability to reach the pinnacle of their sport and were classified as Australian
Olympians for the purpose of this study. This process allowed each Olympian to be aligned with a best-fit Local Government Area (LGA); a spatial unit representing an Australian geographic area often used for Census and statistical purposes (Australian Institute of Health and Welfare, 2007). Accordingly, an athlete’s early developmental environment (EDE) could be defined, which was essential in identifying a “hotspot”.

Given internet and archival sources can vary in quality and reliability (Hancock & Algozzine, 2006), several trustworthy resources were utilised including official webpages for the AOC, Australian Olympic Team (2000, 2004, 2008, 2012), National Sporting Organisations (NSO’s) and State and National sporting institutes alongside other comparatively informal resources including Olympian’s personal, business, sporting club and/or social media (for example, LinkedIn, Facebook) web pages found through a basic Google search engine query. Where online records were limited for any particular Olympian, data collection was supplemented with print media and archival resources obtained from the National Sport Information Centre (NSIC), located at the AIS in Canberra. This included, but was not limited to, official Australian Olympic and Commonwealth Games team handbooks, event programs and guides published by NSO’s or event organisers, Australian Institute of Sport (AIS) annual handbooks and newspaper articles. Due to privacy and ethical reasons, no direct contact with Olympians or their associates took place during data collection to gain or clarify information. Study 1 did not require University ethics to be undertaken due to the non-intrusive nature of utilising publicly available, internet and archival data (Blackstone et al., 2008). Such methodological features however, contain inherent limitations given biographical data regarding EDE could not be clarified with Olympians’ prior to identifying or visiting the “hotspot”; potentially, this may have led to some data-based inaccuracies.

4.3.2 Data analysis

4.3.2.1 Quantitative data analysis - Identifying the “hotspot”

Prior to formal analysis, all data was screened according to a set of inclusion-exclusion criteria. This included justification for sole focus on Australian summer Olympians (1984-2012), classification of Australian-born and raised Olympians, assigning athlete’s EDE to a particular LGA and determining a “hotspot” based on LGA boundaries.
4.3.2.1.1 Inclusion-exclusion criteria

Australian summer Olympians (1984-2012)

Given the 1984 Games were the first Olympics at which Australia competed following the inception of the AIS in 1981, it was anticipated Olympians training and competing prior to this time experienced vastly different trajectories concerning technology, training and talent development programs. For consistency, Olympians only had their 1984-2012 representations accounted for even if they had competed at a Games prior to this period, so as to not misrepresent the “hotspot” or designated timeframe for this study. Paralympians competing in Olympic demonstration events and winter Olympians were excluded, due to anticipation that their early developmental experiences would be highly variable.

Australian-born and raised athletes (6-15 years of age)

Data was only included for Olympians whose EDE (6-15 years of age) had been in Australia. This age range was considered to accurately determine where they had spent their sampling (6-13) and specialising (13-15) years (Côté, 1999). Olympians’ EDE was based on the known geographic location of their birthplace/known area in which they were raised, schooling and junior sports club(s). Limited knowledge of overseas developmental environments excluded Olympians born or partially raised overseas from this study, especially if they were not known to have arrived in Australia prior to 6 years of age, or began junior participation in their Olympic sport in another country prior to migrating to Australia.

Defining early developmental environment (EDE) according to LGA

Location of birthplace/known area in which they were raised, schooling and junior sports club(s) were used as proxy measures for locating an Olympians’ EDE. To be assigned to a LGA, at least two categories of proxy measures needed to align. Predominantly, only one LGA was recorded as an Olympians’ main EDE. For some Olympians however, their EDE was considered to be equally shared amongst multiple LGAs when a suburb they spent significant time in was overseen by up to three LGA councils or when athletes spent equal time in two or more neighbouring LGAs based on their biographical data. Due to practical and ethical issues with being unable to clarify this information with Olympians themselves, a ‘best fit’ method was used to assign athletes to a LGA. If a single LGA could not be differentiated, all relevant LGAs were listed. A small number of Olympians were not classified to any EDE, due to insufficient biographic data or frequent childhood moves around Australia.
4.3.2.1.2 Determining a “hotspot” based on LGAs

To account for Olympians who competed at multiple Games, LGAs were counted once per representation, rather than once per athlete. Doing so allowed for measuring a LGA’s consistency in performance, given that Olympians competing at multiple Games had equal chance of making subsequent teams as an athlete competing for the first time. A tally was created of representations was created for all LGA’s where Olympians were known to have had an EDE, with the 2011 population for each LGA recorded. This was due to the 2011 Australian Census being the most recent at the time of this study, alongside knowledge that LGA boundaries had changed during 1984-2012 through variations in population as well as statistical and/or political reasons. Accordingly, LGA parameters for this study were based on current, as opposed to historical boundaries. The purpose of doing so was to ensure that the subsequent case study analysis occurred within a clearly defined geographic area in which LGA councils were existing and accessible, alongside providing clarity about the identified “hotspot” to Study 2 participants.

The total number of Olympic representations per LGA was then compared to population size (per 100,000). Rates per 100,000 are often used by demographers and can allow for comparisons to be made between areas with populations of more, or less than, 100,000 (STATS Indiana, 2016). For each LGA known to be associated with Olympic representations, this comparison was expressed through a simple equation:

\[
\frac{\text{Total number of LGA Games representations}}{2011 \text{ LGA population}} \times 100,000
\]

From these calculations, LGAs were ranked in order of Olympic representations produced per head of the population. The top 20 were closely observed in relation to their population size, number of Olympic sports represented by the LGA, number of individual Olympians and the highest places these Olympians achieved at the Games. This was to ensure low population numbers did not artificially ‘inflate’ a LGA’s status as a “hotspot”. LGAs were also considered geographically to determine if any were bordering each other. This methodology was partially inspired by the work of Toohey et al (2015) and enabled identification of a “hotspot” and case study site.
4.3.3 Data collection

4.3.3.1 Internet and archival data collection

4.3.3.1.1 Situating the “hotspot” in an Australian context

After identifying a “hotspot”, Study 1 focused on situating it within an Australian context. Provided standardised primary data collection methods are used (Diez Roux, 2001), using population data is advantageous for providing a reliable measure of the total population and sub-groups (Australian Bureau of Statistics, 2013f). Demographic and climate data for “hotspot” LGAs and Australian averages were collected for the purpose of identifying potential variances within the “hotspot” which may potentially influence athlete development. Predominantly, Study 1 relates exosystem factors from Bronfenbrenner’s EST (1979b), such as demographics and the climate due to its relationship with broader community-level factors, which may indirectly influence development. Archival, internet-based government sources, including the Australian Bureau of Statistics (ABS) (http://www.abs.gov.au/) and Bureau of Meteorology (BOM) (http://www.bom.gov.au/), were used for data collection. An overview of these demographic and climate variables can be viewed in Table 4.1.

...
Table 4.1 Overview of demographic and climate data collected in Study 1

Demographic and climate variables investigated

- Demographic
  - LGA Population size
  - Median age (years)
  - Median weekly household income ($AUD)
  - Occupied private dwelling with a mortgage - home owned outright (%)
  - Occupied private dwelling – separate house (%)
  - Secondary schools students (government/non-government/Catholic)(%)
  - Non-school qualification: tertiary education (age 15 and over)(%)
  - Couple family with children (%)
  - One parent family (%)
  - Volunteered within the last 12 months in an organisation (age 15 and over (%)
  - Born in Australia (%)
  - Aboriginal and Torres Strait Islander (%)
  - Australian citizen (%)
  - Speak English only (at home)(%)
  - Youth employment (15-24 years)(%)

- Climate
  - Mean minimum and maximum temperatures (°C)
  - Average daily air temperature (°C)
  - Mean daily sunshine (hours)
  - Mean annual rainfall (mm)
  - Mean number days of rain (annual)
  - Mean 9am relative humidity (%)
  - Mean 3pm relative humidity (%)
  - Mean daily wind speed (km/h)
  - Max daily wind gust (km/h)

The ABS collects Census data every five years in order to capture key characteristics of Australian residents and the dwellings they live in (Australian Bureau of Statistics, 2014b). Originally, the intention of this data collection phase was to record information for “hotspot” demographic variables 1967-2002, as this period encompassed 90% of identified 1984-2012 “hotspot” Olympians’ early development years (ages 6-15). Due to a variety of reasons, there were a considerable number of challenges in accessing some, or all of this data to run comprehensive and reliable statistical analyses. Changing population numbers, statistical and/or political reasons lead to Australian LGA boundaries being modified over time, including within the “hotspot”.

Although LGA boundaries in metropolitan Perth where the “hotspot” is located have remained largely unchanged since the late nineteenth century (Jones, 2009), the ABS has continued to add new variables into the Census over time. Additionally, some of the recorded categories for these variables have changed in such a way that this demographic data experiences a number of inaccuracies in its alignment over an extended historical period, as required for the nature of this study. The more historical data became, data on
fewer variables was available, in conjunction with their measurement by the Government being presented in publically available documentation at a statistical local area or capital city level only, rather than the LGA level as required. Accordingly, these factors further complicated the data collection and analysis of the required demographic material. For these reasons, only 2011 demographic information was obtained for this study to ensure consistency in the Census data collected and allow a timely, descriptive snapshot of the “hotspot” within an Australian context at the time of the study. This decision also correlated with the need for the case study to occur within clear parameters relevant to, and understood by participants.

Historical data for climate variables was also collected for the period 1967-2002, encompassing 90% of identified “hotspot” Olympians’ early developmental years. Archival data from official, permanent BOM measurement sites was accessed and for consistency, weather stations located at Australia’s eight main capital city airports were used as the point of reference for climate data collection. The capital city airport closest to the “hotspot” site (also located in a metropolitan capital city area), was used as a proxy for its climate. Predominantly, this decision was made following the determination that there had not been one continuously running BOM site within the “hotspot” throughout the Olympians’ early developmental years. This was due to site closure and re-creation in a new location which resulted in an eleven year gap in data existing for “hotspot” weather stations, thus creating data inconsistencies which would hinder accurate statistical analyses. Despite the use of secondary archival data being inherent with potential benefits (Jackson, 2015; Timothy, 2012), it can become limiting in cases where resources were previously created for other projects (Vogt, Gardner, & Haefele, 2012) and accordingly have greater potential for inaccuracies in data (Yin, 2009) as demonstrated in this instance. Modified collection of demographic and climate data based on similar measures did however enable a broader profile of the “hotspot” to be situated within an Australian context, prior to conducting the case study. Simultaneously, this process also provided the opportunity to triangulate Study 2 data, albeit with some potential limitations.
4.3.4 Data analysis

4.3.4.1 Quantitative data analysis - Situating the “hotspot” in an Australian context

Raw ABS and BOM data was entered into an Excel spreadsheet file, where descriptive statistics were calculated to provide a demographic and climatic overview of the “hotspot” context. A series of one-way ANOVA tests were also conducted to compare BOM data for Perth to other Australian capital cities. This included post-hoc comparisons using the Tukey HSD test when statistically significant findings (p < .05) were determined. Similar comparisons were unable to be made with ABS demographic variables as access to the complete raw data set was restricted by both privacy and cost barriers within the ABS digital archives. Effect sizes using partial $\eta^2$ were calculated for the BOM data ANOVA tests. Using a modification to the effect size scale of Cohen (1988), scores were assessed against this profile; 0–0.2 was considered to be a trivial effect, 0.2–0.6 small, 0.6–1.2 moderate, 1.2–2.0 large and a z-score>2.0 represented a very large effect (Hopkins, 2002).

4.4 Study 2 - Olympians’ and community perceptions of the “hotspot”

Study 2 aimed to investigate Olympians’ and community perceptions on several individual, contextual and environmental factors, which may have led to the “hotspot’s” development and which positively influenced athlete development. Semi-structured interview data was collected and examined through the lens of Bronfenbrenner’s (1979b) EST following ethics approval in accordance with University of Sydney (2014) Human Ethics (Appendix B).

4.4.1 Data collection

4.4.1.1 Primary recruitment via email

The primary recruitment tool for semi-structured interviews with “hotspot” sporting community stakeholders was via email, due to the necessity of remotely recruiting a large number of participants prior to conducting the case study. The WA Department of Sport and Recreation club search portal (http://www.dsr.wa.gov.au) was used to identify all sports clubs within each suburb comprised within the “hotspot”. The list was narrowed down to clubs correlating with an Olympic sport represented by the “hotspot” including athletics, gymnastics, hockey, rowing, sailing, swimming, surf lifesaving and water polo clubs. Surf lifesaving clubs were also included given their potential to develop skills transferable to Olympic sports. For example, beach sprints (athletics), surf ski (canoe/kayak) and swimming.
Using contact details found on sports club websites, the club presidents of 21 clubs (including 4 school-based clubs) were contacted. The presidents were each sent an introductory email outlining the study and inviting targeted participant cohorts, including current elite athletes (junior and senior), their parents and coaches and club committee members, to partake. Attachments to the emails included a personally addressed introductory letter to sports club presidents, a flyer advertising the study and a Participant Information Statement. These can be viewed in Appendices C-E respectively. Presidents were encouraged to share this information with club members via email, club newsletter or printed summary. Participants who volunteered to partake in semi-structured interviews responded to the researcher via this initial email by providing their full name, email address and phone number. Mayors were also contacted directly through local councils during this initial recruitment period. Through these measures, a small number of Study 2 participants (n=10) were recruited, which resulted in purposive measures being taken during semi-structured interviews to increase participant numbers; particularly in light of knowledge that an identified 32 Olympians had experienced their early developmental environment within the “hotspot” (to be discussed further in Chapter 5).

4.4.1.2 Secondary recruitment

Collectively, this project sought to recruit 29-36 interview participants in Study 2, based on content analyses of prior PhD research (Mason, 2010) and other postgraduate studies (Balish, 2011; Henriksen, 2010) that have used similar sample sizes based on the premise that saturation can be achieved within this range. Purposive snowball sampling measures enabled recruitment figures for Olympians and community stakeholders to be met through implementing this technique amongst the initial cohort of Study 2 participants alongside others once participant numbers grew. This was instigated through multiple individuals (Pitney & Parker, 2009) in order to reduce the bias that may be shared among pre-existing connections (King & Horrocks, 2010).

Clear researcher instruction was provided on the type of participants required to diversify the sample (King and Horrocks, 2010), with some of the initial participants becoming key gatekeepers by introducing others within their sporting and personal networks to the study. Both formal and informal gatekeepers (Seidman, 2013) were drawn upon, with identification usually occurring through chance information arising in interviews or where the researcher had prior knowledge of the ‘gatekeepers’ relationship with participants of interest. Typically, these gatekeepers were coaches, sports administrators, family and fellow athletes. New participants were usually contacted via phone or email to formally provide them with
information about the study and the key themes to be investigated within semi-structured interviews.

As a non-participant researcher, pre-existing relations within the “hotspot” were not present. It is known that researchers can more easily establish contact with new participants when referred by a trusted person (Polit & Beck, 2012). This was vital given the one month period spent in the “hotspot” conducting interviews with the assistance of key ‘gatekeepers’ (Seidman, 2013), such as high performance coaches, sports administrators and club committee members aiding this process.

4.4.1.3 Semi-structured interviews

In Study 2, semi-structured interviews were the prime source of data collection due to their ability to allow participant reflection, whilst simultaneously commenting on pre-selected research-relevant issues (Creswell, 2014). This ‘guided conversation’ (Côté & Raz, 2014) is also considered advantageous because it provides opportunity for discussion of useful information which may otherwise not have arisen (Pitney & Parker, 2009) and enhances researchers’ understanding of historical events in which they did not participate (Creswell, 2009; Yin, 2014). This was deemed essential within a retrospective study where Bronfenbrenner’s (1979b) EST was used to guide interview schedules around various themes which had potential to provide insight into an Australia sporting “hotspot”.

4.4.1.3.1 Interview schedule

Designed specifically for this study, the interview schedule was inspired by both Balish (2011) and Henriksen’s (2010) research, which also utilised Bronfenbrenner’s (1979b, 2005a, 2005b) work to holistically explore athlete development environments. All levels of the EST were incorporated into this schedule, aside from mesosystem and chronosystem factors; these two systems were best observed during analysis only when exploring the interrelationships between various microsystem influences and key historical events within the “hotspot” respectively. This was considered appropriate given investigation of mesosystem factors can often be most complex due to dynamics occurring at the microsystem level (Bjorklund & Blasi, 2012).

Interview schedules were divided into four themed sections. The introductory section contextualised an individual participant’s background and role within the “hotspot” sporting community. Secondly, microsystem factors including family, school and community sports clubs alongside their perceived ability to influence early athletic development, were explored. The following section investigated perceptions of exosystem factors relevant to the broader “hotspot” community including built and natural facilities in the physical environment,
alongside the “hotspot” social environment. The final section explored the role of sport in Australia’s national identity and the influence this was considered to have had on the “hotspot’s” sporting culture and subsequent influence on Olympians throughout their development. Sample interview schedules can be viewed in Appendices F and G with variations to wording made according to participant type.

4.4.1.3.2 Participants

Overall, 36 semi-structured interviews with 42 participants were conducted within Study 2; 11 Olympians and 31 community stakeholders. An overview of the final number of interviewees by category can be viewed in Table 4.2, with a summary of individual participant backgrounds to be provided in Chapter 6. Each of the participants was provided with a pseudonym for privacy reasons with consideration to broadly accepted human ethics practices.

Table 4.2 Study 2 semi-structured interview participants

<table>
<thead>
<tr>
<th>Participant categories</th>
<th>Participant numbers</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Current elite junior (teenagers ≤18 years of age) athletes who have competed at a national level or higher</td>
<td>3</td>
</tr>
<tr>
<td>• Current elite senior (≥ 18 years of age) athletes who have competed at a national level or higher</td>
<td>1</td>
</tr>
<tr>
<td>• Parents of current junior or senior elite athletes</td>
<td>7</td>
</tr>
<tr>
<td>• Coaches of current elite (junior or senior) athletes</td>
<td>8</td>
</tr>
<tr>
<td>• Club committee members and high performance sports administrators</td>
<td>9</td>
</tr>
<tr>
<td>• Members of local government or council (i.e. mayor)</td>
<td>3</td>
</tr>
<tr>
<td>• 1984-2012 “hotspot” summer Olympians</td>
<td>11</td>
</tr>
</tbody>
</table>

Note: At the time of the semi-structured interview, participants associated themselves with a prime participant category, however several held multiple roles past or present. e.g. club committee member and parent of elite athlete, coach of elite athletes and high performance sports administrator.

Each of these individuals was provided with a pseudonym for privacy reasons and a detailed summary of semi-structured interview participants can be viewed in Chapter 6 prior to analysis of results.
4.4.1.3.3 Pre-interview preparation

Recruited participants were contacted up to three weeks prior to nominate a time and place of their convenience for a one hour interview. Email correspondence, where relevant, was reviewed prior to interviews in order to reflect upon any informal discussion that had already taken place. Similar to Durand-Bush’s (2000) methodology, internet searches and newspaper articles were also utilised to become acquainted with high profile participants such as Olympians, mayors or international level coaches. A summary of key points (for example, key achievements, affiliations with clubs, key people or other participants, views informally shared about the “hotspot” during initial contact) was then recorded in a research diary to allow familiarisation of participants and highlight key areas to be revisited during the interview. This preparation was invaluable as it is known to be vital in enhancing a researcher’s knowledge and confidence in undertaking interviews (Mikecz, 2012).

4.4.1.3.4 Conducting the interview

Regardless of the participant, an identical procedure was followed regarding the researcher’s safety protocol (Appendix H) and interview schedule. All participants were briefed in layman’s terms about the interview’s purpose, despite having received information during recruitment. This was to honour the researcher’s obligations to orient participants to the interview process, without making assumptions its nature is understood due to consent being provided (King & Horrocks, 2010; Pitney & Parker, 2009). Verbal consent was gained immediately prior to commencement of each interview and recorded on audio with all participants agreeing to the process. Two digital recorders were used simultaneously to minimise data loss through potential technical errors (Mears, 2009) and allow participants to be given full attention without the need for note-taking.

Interviews took place at a location of the participant’s choice (either their home, workplace or a café), given utilising a physical space they feel relaxed in is important for building rapport, the participant’s psychological comfort and for promoting reflection (King & Horrocks, 2010; Mockler, 2011). Interviews were primarily conducted one-on-one, although junior elite athletes (<18 years) were always interviewed with a parent in attendance. Interviews ranged from 38 minutes to 128 minutes in length, with the mean length being approximately 68 minutes.
4.4.1.3.5 Post-interview

Following each interview, all participants were given a small token of appreciation (either a University of Sydney key ring or pen), in accordance with the University of Sydney Human Ethics Guidelines which stipulates appropriateness in offering tokens of appreciation proportional to the time and effort required by a study (The University of Sydney, 2014). To avoid coercion or bias, this was not advertised during recruitment which may indicate the authentic intentions of Study 2 participants.

Participant’s interest in receiving a copy of their transcribed interview prior to analysis was also verbally gauged as this can enhance the rigour of qualitative data through establishing trustworthiness and validity (Hallett, 2013). Although no participants accepted this opportunity, all agreed to be emailed an Executive Summary of results at the conclusion of the PhD, which is considered another valid form of member-checking (Polit & Beck, 2012).

Finally, key points from each interview were recorded in the research diary to create a summary, which informally guided initial stages of qualitative analysis. Digital audio files were downloaded to the researcher’s computer, backed-up and de-identified with a pseudonym, before being password protected. Pseudonyms were listed in a password protected Excel spreadsheet with names and contact details, so participants could later be emailed an Executive Summary of results. Within a week of the interview, participants were again thanked via email with this enabling continued rapport to be built. In the earlier stages of the study, building rapport with key ‘gatekeepers’ (Seidman, 2013) was especially important, as it enabled the recruitment of many “hotspot” Olympians who were later interviewed.

4.4.2 Data analysis
4.4.2.1 Qualitative data analysis

Qualitative data analysis should be shaped by philosophies underpinning the chosen research paradigm, questions being asked and the methodological approaches adopted (Bazeley & Jackson, 2013). Accordingly, various approaches were considered prior to NVivo 10 analysis. Similar to Henriksen (2010), coding at the elementary level was based on a deductive-inductive approach, which illustrates polar opposite views on the spectrum of reasoning methods. Aligned with positivism, deduction is useful when researchers aim to re-test existing theories or data within a new context in order to assess hypotheses about specific observations made (Elo & Kyngäs, 2008; Tavory & Timmermans, 2014). Alternatively, induction involves collecting new data where no previous studies have dealt with a phenomenon, or when aiming to problematise or strengthen existing theories.
Accordingly, these processes may allow for the substantiation of future generalisations about a sample with reasonable levels of certainty (Elo & Kyngäs, 2008; Given, 2008; Tavory & Timmermans, 2014).

A deductive-inductive approach was relevant to this project, as it was possible to re-test Bronfenbrenner’s (1979b) EST within a new context encapsulated by an Australian sporting “hotspot”. Parent nodes (key themes) were deductively built around the levels of Bronfenbrenner’s (1979b, 2005a) EST (e.g. microsystem). They were accompanied by additional child nodes (sub-themes) which fit within the framework’s ideologies, yet move beyond the existing theory (inductive) to meet the unique demands of this study (e.g. microsystem → community sports clubs → club culture and spirit). The design of the parent nodes allowed flexibility in inductively expanding child node branches as analysis progressed and other new, unexpected themes emerged.

Despite their individual value and perceived relevance to this project, a deductive-inductive approach to qualitative data analysis has inherent limitations, with neither component of this approach accurately representing the qualitative analysis method used within Study 2. Given the close alignment of qualitative research with naturalism, deductive reasoning has been criticised due to its application of a general theory to data to reach conclusions about findings (Miller & Brewer, 2003) and because it encourages researchers to reiterate an existing theory at the expense of their own data (Tavory & Timmermans, 2014). Alternatively, using inductive reasoning to build towards new theories that are subsequently applied to similar sample populations, has been criticised for its tendency to generalise findings (Given, 2008) and for being unclear on why data patterns exist (Babbie, 2007).

Deduction and induction are not particularly creative methods of data analysis, as they are not guaranteed to lead to new understandings (Peirce, 1992-98; Tavory & Timmermans, 2014). Beyond elementary coding, Tavory and Timmermans (2014) moderated abductive approach was the main data analysis method used due to its association with mixed-methods research and pragmatic paradigms (Patton, 2015). Abductive analysis draws upon the properties of both deductive and inductive reasoning whilst remaining characteristically unique. It encourages iterative movement between observation and theory in order to find the most probable explanation for investigated phenomena (Sober, 2013). Accordingly, discovery and creativity in qualitative work is promoted which allows research conclusions to move beyond existing theories (Tavory & Timmermans, 2014).
An illustration of how deduction, induction and abductive analysis are placed on the spectrum of qualitative reasoning methods, with examples pertaining to this study, can be viewed in Figure 4.2.

Figure 4.2 Qualitative approaches to data analysis, as exemplified by this study

Although this study took place within the framework of Bronfenbrenner’s (1979b, 2005a) EST, the conversational style of semi-structured interviews resulted in the discovery of unexpected themes beyond the framework’s parameters. For example, chance related factors do not clearly align with the EST, yet contribute to a complete understanding of the “hotspot’s” occurrence when interpreted in relation to other levels of the EST. Additionally, abductive reasoning allowed for flexibility around the application of the ‘Bioecological Model’ (BM) (Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 1998) as demonstrated by the combined discussion of the results from Study 1 and 2 in Chapter 7. Although this project did not allow the BM to be used in its entirety, abductive analysis enabled insightful discussion explore proximal processes, heritability, time and other personal characteristics not accommodated for by the EST.

The use of practices such as abductive reasoning do not present limitations with Bronfenbrenner’s frameworks, given they were designed as general human development theories without the intent of a sport-specific focus. Ultimately, implementing an abductive approach allowed hidden connections between phenomena to emerge and a pragmatic
determination of the most probable reasons for the “hotspot’s” development and subsequent influence on Olympians’ athletic development.

These broader theoretical underpinnings were kept forefront throughout the qualitative data analysis process. Formal data analysis commenced once all semi-structured interviews had been conducted and transcribed from the audio recordings of the interviews. The majority of interviews ($n = 20$) were transcribed using InqScribe software, with the remainder ($n = 16$) outsourced to a professional, overseas transcription service (in order to maximise participant privacy) due to time restrictions. To ensure consistency in transcriptions, a final check of the synchronised audio and Microsoft Word transcripts was undertaken prior to data analysis (Kuckartz, 2014). At this stage, key themes, ideas and observations that arose were noted in the research diary, in order to aid the subsequent formation of potential NVivo ‘umbrella’ themes, parent and child nodes.

The analysis process using NVivo 10 software began with importing all community stakeholder and Olympians transcript documents into differing internal source folders, due to their data being coded separately in the first instance. In creating this dichotomy between interview participants, two separate, but similar node trees were then created across two node folders. This allowed the first stage of analysis for both community stakeholder and Olympians interview data to occur entirely separate from one another, resulting in the creation of 172 parent nodes and 488 child nodes. With both sets of Study 2 data, a series of ‘umbrella’ themes directed by the framework of Bronfenbrenner’s EST (1979b) dictated the first level of nodes. Through abductive reasoning processes that began with informal research diary analysis notes at the point of transcription, other ‘umbrella’ themes such as ‘chance, happenstance and other circumstantial factors’ were formally added to analysis at this point in time. These ‘umbrella’ themes and similar coding structure for community and Olympians in the first coding stage provided the scaffolding for an eventual 86 parent nodes and 244 child nodes arising from segmented and coded transcript data from both groups of Study 2 participants. Due to the nature of their content, several interview segments were simultaneously coded to multiple nodes within and across parent themes and/or ‘umbrella’ nodes where relevant.
Throughout the duration of this process, memos were created and attached to key parent nodes of emerging interest. These memos encapsulated reflective summary notes of key findings from transcript segments assigned to the child nodes within them, as well as overall impressions. These memos formed the basis of direction in the next stage of analysis which entailed minimising the broader tree of nodes into a series of workable themes which could be highlighted as a framework for presenting Study 2 results in Chapter 6. The final set of nodes was reduced to 21 key themes and 24 sub-themes encapsulated by the ‘umbrella’ themes representing each level of the EST (individual, microsystem, mesosystem, exosystem, macrosystem, chronosystem) in addition to chance, happenstance and other circumstantial factors. A detailed overview of this structure can be viewed in Table 6.4, in addition to the number of overall references (with differentiations of community and Olympians data) drawn from parent and child nodes pertaining to the final sub-themes. Following convention of published qualitative work within the field however, exact numbers of participants adhering to particular viewpoints will not always be conveyed in the presentation of results. Comparatively, descriptive quantitative language will be used to elucidate broad applicability of results among participants or lack thereof.

4.5 Establishing trustworthiness

The ability to make quality inferences during research is of utmost importance, particularly for MM studies, in which diverse quantitative and qualitative procedures are used to answer research questions (Teddlie & Tashakkori, 2009). Accordingly, a number of trustworthiness strategies were discussed within this chapter and were implemented across Study 1 and 2. This was to ensure the conclusions reached were both appropriate and consistent with the available evidence. A summary of these measures can be viewed in Table 4.3.
### Table 4.3 Summary of procedures used to ensure trustworthiness within this project

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Implementation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Triangulating different data sources to build a coherent justification for</td>
<td>A MM, quan→QUAL design (Creswell, 2014; Morse, 1991) was used across Study 1 and 2 respectively. Biographic and archival data, as well as several trustworthy internet sources (i.e. official webpages for the AOC, Australian Olympic Teams, National Sporting Organisations (NSO’s) and State and National sporting institutes), was used to identify information about Olympians’ and to contextualise the “hotspot” (Study 1) followed by obtaining Olympians’ and community perceptions of the “hotspot” through semi-structured interviews (Study 2).</td>
</tr>
<tr>
<td>themes and conclusions (Creswell, 2014; Teddlie &amp; Tashakkori, 2009)</td>
<td></td>
</tr>
<tr>
<td>Using member-checking to determine the accuracy of findings</td>
<td>All Study 2 participants were emailed an Executive Summary of key results at the conclusion of the PhD and were offered a copy of their transcribed interview with opportunity to provide feedback as required.</td>
</tr>
<tr>
<td>(Creswell, 2014; Polit &amp; Beck, 2012)</td>
<td></td>
</tr>
<tr>
<td>Using rich, thick description to convey the findings with the potential</td>
<td>Once the “hotspot” was identified, Study 1 provided a contextualised overview of the “hotspot” through quantitative demographic and climate data which was accompanied by additional secondary literature in the interpretation and discussion of results. Study 2 semi-structured interviews and presentation of findings incorporated the viewpoints of 42 participants from the “hotspot”; 11 Olympians and 31 community stakeholders.</td>
</tr>
<tr>
<td>to transport readers to the setting (Creswell, 2014; Geertz, 1973; King</td>
<td></td>
</tr>
<tr>
<td>&amp; Horrocks, 2010)</td>
<td></td>
</tr>
<tr>
<td>Presenting negative or discrepant information about the themes</td>
<td>The inclusion of 42 participant voices across 36 interviews within Study 2 data collection and presentation of findings enabled a range of viewpoints to be obtained and presented in order to demonstrate similarities and difference of opinion across 21 themes and 24 sub-themes. Furthermore, themes pertaining to chance (i.e. climate, geographic good fortune, exposure to sporting opportunities, a series of planned and fortuitous factors coming together) were identified during analysis, that did not neatly fit within the constraints of Bronfenbrenner’s (1979b) EST</td>
</tr>
<tr>
<td>(Creswell, 2014)</td>
<td></td>
</tr>
<tr>
<td>Spend prolonged time in the field (Creswell, 2014; Teddlie &amp; Tashakkori,</td>
<td>In total, the researcher spent one month within the “hotspot” conducting interviews with Olympians and the community for Study 2. This trip was divided into two stages set six months apart, which enabled preliminary reflection and analysis upon key interview themes and findings, before re-immersion into the “hotspot” context.</td>
</tr>
<tr>
<td>2009)</td>
<td></td>
</tr>
<tr>
<td>Peer debriefing (Creswell, 2014; Teddlie &amp; Tashakkori, 2009)</td>
<td>This involved a formal review of the research proposal in a forum setting as part of University PhD requirements, followed by ongoing reflection and discussion with both research supervisors during data collection and analysis.</td>
</tr>
</tbody>
</table>

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4.6 Conclusion

This chapter outlined the project’s key research questions and discussed the MM research design, data collection and analysis methods utilised to address them across two unique, yet inextricably connected studies. Collectively, these chosen methods were identified in order to address the key aims of this study, which were to identify if a “hotspot” of 1984-2012 Australian summer Olympians existed and where it was located, followed by investigation of its perceived influence on Olympians who experienced their early athletic development in this environment. The final section outlined and reviewed several strategies used to establish trustworthiness within this MM project, with ethical considerations discussed throughout the chapter where relevant.
Chapter 5
Study 1 – Identifying and situating the “hotspot” within an Australian context

5.1 Introduction

The first study within this mixed-methods (MM) project aimed to identify if, and if so, where a “hotspot” of 1984-2012 Australian summer Olympians existed relative to population size (per 100,000). This start date of 1984 was chosen because it was the first summer Olympic Games Australia competed at following the inception of the Australian Institute of Sport (AIS) in 1981; the nation’s first designated sporting institute. This study also sought to situate the “hotspot” within an Australian context through the collection of climatic and demographic data. Collectively, the purpose of this study was to determine the location and context of a case study site to be explored in Study 2. In addressing these aims, the purpose of Study 1 was to answer the following research question:

*Which Australian Local Government Areas (LGAs) comprise a “hotspot” area for 1984-2012 Australian summer Olympic representatives and how does the “hotspot” compare demographically and climatically to other Australian areas?*

Predominantly, Study 1 relates to the *exosystem* level of the Bronfenbrenner’s EST (1979b) due to its relationship with social environment and broader community factors, which have potential to indirectly influence an individual’s development. Examination of these variables enabled quantitative knowledge of the “hotspot” to be gained, prior to qualitatively investigating Olympians’ and community perceptions, alongside triangulating these results.
5.2 Results and discussion

5.2.1 Identifying the “hotspot”

5.2.1.1 Participant profile

In total, early developmental environment (EDE) data was collected for all known Australian summer Olympians (1984-2012), both male and female, across all sports (n=2160). This includes athletes who may not have been officially noted on Australian Olympic Committee (AOC) team lists due to late selection or replacement, withdrawal due to injury and personal reasons or being a reserve, but were otherwise verified by their sporting community. Table 5.1 provides an overview of the 1984-2012 Australian summer Olympians comprising the participant cohort for this study.

<table>
<thead>
<tr>
<th></th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of summer Olympians</td>
<td>2160</td>
<td>1301 (60.2%)</td>
<td>859 (39.8%)</td>
</tr>
<tr>
<td>Born and/or grew up overseas</td>
<td>184 (8.5%)</td>
<td>113 (61.4%)</td>
<td>71 (38.6%)</td>
</tr>
<tr>
<td>Australian-born Olympians: inadequate data collected</td>
<td>234 (11.8%)</td>
<td>148 (63.2%)</td>
<td>86 (36.8%)</td>
</tr>
<tr>
<td>Australian-born Olympians: successfully assigned to an early developmental environment</td>
<td>1742 (88.2%)</td>
<td>1040 (59.7%)</td>
<td>702 (40.3%)</td>
</tr>
</tbody>
</table>

The majority of Australian summer Olympians who competed 1984-2012 were Australian-born and male (60.2%), with only a minority of these Olympians in the overall cohort known to be born and/or raised overseas (8.5%). For analysis purposes, the inability to ascertain overseas EDEs resulted in the removal of non-Australian born athletes from the cohort. These figures are likely to represent an accurate representation of the participants in
this study, given that adequate EDE data was unable to be collected for only 11.8% of Olympians. The majority of eligible, Australian-born and raised Olympians (88.2%) were successfully assigned an EDE based on Local Government Area (LGA). Team numbers for Australian summer Olympians were smallest in 1984 (n =248), gradually increasing and peaking for the Sydney 2000 Olympics (n=640), before steadily declining until 2012 (n=411). At each of these eight Games, male Olympians comprised the majority of the athlete cohort with this being most prevalent at the 1988 Olympics (72.1%). The greatest male-female parity was present within the 2008 Olympic team, in which female athletes comprised 46.6% of the Australian team.

5.2.1.2 Olympian’s affiliation with an early developmental environment (EDE)

As illustrated in Table 5.2, 1742 Australian-born and raised Olympians were successfully assigned a LGA of EDE based on the confirmed alignment of at least 2 of the following measures: known geographic location of their birthplace or area in which they were raised, schooling and junior sports club(s).

Table 5.2 Descriptive statistics of athlete affiliation to Local Government Areas (LGAs) as a proxy for their early developmental environment (EDE)

<table>
<thead>
<tr>
<th>Analysis by LGAs</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Number of athletes successfully affiliated with a LGA (Australian-born and raised athletes)</td>
</tr>
<tr>
<td>• Number of athlete’s affiliated with 1 LGA only</td>
</tr>
<tr>
<td>• Number of athlete’s affiliated with 2 or more LGAs</td>
</tr>
</tbody>
</table>

The majority of Olympians (90.4%) were associated with only one LGA throughout their early development. A relatively small number of athletes (n = 168) were equally associated with 2 or more LGAs based on their proxy measures. This usually occurred when suburbs associated with their EDE were simultaneously overseen by up to three LGA councils, or when EDE was equally spent in two LGAs that were not geographically proximal.
5.2.1.3 Finding the ‘Top 20’ Local Government Areas (LGAs) to determine a “hotspot”

In total, 292 unique LGAs were represented as the location of 1984-2012 Australian summer Olympians’ EDE. As demonstrated in Figure 5.1, these LGAs were geographically scattered across each of Australia’s eight states and territories. Each dot in the Maptive scatter map represents a LGA where at least one Olympian was known to have spent their early development (6-15 years), although geographically many are not as close as they appear.

![Figure 5.1 Scatter map of Olympians’ early developmental environment (EDE) by Local Government Area (LGA)](image)

Using distinguishable Local Government Area (LGA) boundaries, the “hotspot” was determined through identifying a proportionately high number of Australian summer Olympic representations (1984-2012). Identification of this “hotspot” also considered measures of consistency in performance in producing Olympic representatives, including number of individual athletes making an Olympic team in the 1984-2012 timeframe, total number of representations collectively made by these athletes and best place at a Games. Given LGA’s vary in size in different parts of Australia and rural compared to urban areas, measuring numbers of Olympic representations compared to LGA population size were based on rates per 100,000 as commonly used by demographers (STATS Indiana, 2016). Table 5.3 provides an overview of Australia’s Top 20 LGAs that produced a proportionately high number of Olympic representations compared to population size.
Table 5.3 Top 20 Australian LGAs based on the proportion of Olympic Games representations (1984-2012) compared to population size

<table>
<thead>
<tr>
<th>LGA</th>
<th>Number of known Olympians</th>
<th>Number of known representations</th>
<th>2011 population</th>
<th>Per 100,000*</th>
<th>Australian classification of LGA**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Narrogin, WA</td>
<td>2</td>
<td>3</td>
<td>875</td>
<td>342.9</td>
<td>RAS</td>
</tr>
<tr>
<td>Franklin Harbour, SA</td>
<td>1</td>
<td>3</td>
<td>1,273</td>
<td>235.7</td>
<td>RAS</td>
</tr>
<tr>
<td>Claremont, WA</td>
<td>11</td>
<td>16</td>
<td>9,280</td>
<td>172.4</td>
<td>UDS</td>
</tr>
<tr>
<td>Nedlands, WA</td>
<td>17</td>
<td>28</td>
<td>20,534</td>
<td>136.4</td>
<td>UDS</td>
</tr>
<tr>
<td>Peppermint Grove, WA</td>
<td>1</td>
<td>2</td>
<td>1,528</td>
<td>130.9</td>
<td>UDS</td>
</tr>
<tr>
<td>Bogan, NSW</td>
<td>1</td>
<td>3</td>
<td>2,900</td>
<td>103.4</td>
<td>RAM</td>
</tr>
<tr>
<td>Cambridge, WA</td>
<td>12</td>
<td>22</td>
<td>24,965</td>
<td>88.1</td>
<td>UDS</td>
</tr>
<tr>
<td>Perth, WA</td>
<td>8</td>
<td>14</td>
<td>16,714</td>
<td>83.8</td>
<td>UCC</td>
</tr>
<tr>
<td>Nannup, WA</td>
<td>1</td>
<td>1</td>
<td>1,262</td>
<td>79.2</td>
<td>RAS</td>
</tr>
<tr>
<td>Cunderdin, WA</td>
<td>1</td>
<td>1</td>
<td>1,310</td>
<td>76.3</td>
<td>RAS</td>
</tr>
<tr>
<td>Warren, NSW</td>
<td>1</td>
<td>2</td>
<td>2,758</td>
<td>72.5</td>
<td>RAM</td>
</tr>
<tr>
<td>Greater Hume, NSW</td>
<td>1</td>
<td>7</td>
<td>9,815</td>
<td>71.3</td>
<td>RAV</td>
</tr>
<tr>
<td>Wellington, VIC</td>
<td>5</td>
<td>6</td>
<td>8,493</td>
<td>70.6</td>
<td>URM</td>
</tr>
<tr>
<td>Yarriambiack, VIC</td>
<td>2</td>
<td>5</td>
<td>7,088</td>
<td>70.5</td>
<td>RAL</td>
</tr>
<tr>
<td>Temora, NSW</td>
<td>3</td>
<td>4</td>
<td>5,776</td>
<td>69.3</td>
<td>RAL</td>
</tr>
<tr>
<td>Vincent, WA</td>
<td>13</td>
<td>21</td>
<td>31,549</td>
<td>66.6</td>
<td>UDM</td>
</tr>
<tr>
<td>Wakefield, SA</td>
<td>3</td>
<td>4</td>
<td>6,662</td>
<td>60.0</td>
<td>RAL</td>
</tr>
<tr>
<td>Flinders Ranges, SA</td>
<td>1</td>
<td>1</td>
<td>1,702</td>
<td>58.8</td>
<td>RAS</td>
</tr>
<tr>
<td>Manly, NSW</td>
<td>16</td>
<td>22</td>
<td>39,747</td>
<td>55.4</td>
<td>UDM</td>
</tr>
<tr>
<td>Ballarat, VIC</td>
<td>24</td>
<td>51</td>
<td>93,501</td>
<td>54.5</td>
<td>URL</td>
</tr>
</tbody>
</table>

Δ denotes the three LGAs identified as the “hotspot”
* rounded to one decimal place
** LGA type according to the Australian classification of local government measures: Rural Agricultural Small (RAS), Urban Metropolitan Developed Small (UDS), Rural Agricultural Medium (RAM), Urban Capital City (UCC), Rural Agricultural Very Large (RAV), Urban Regional Towns/City Medium (URM), Rural Agricultural Large (RAL), Urban Metropolitan Developed Medium (UDM), Urban Regional Town/City Large (URL)(Department of Infrastructure and Regional Development, 2015)
The top 20 LGAs identified were in vastly different geographical locations across four states: Western Australia (WA), South Australia (SA), New South Wales (NSW) and Victoria (VIC). Nearly half (n = 9) were located in WA which indicated that several LGAs in this state had produced a proportionately high number of Olympic representations compared to population size. These results may have been inflated given that WA LGA populations have traditionally been much smaller than the Australian average of 39,272 with nearly half of WA LGAs having ≤ 2000 residents; this often occurs as a Rural Agricultural Small (RAS) classification (Department of Infrastructure and Regional Development, 2015; Gooding, 2012).

“Rural” areas of varying size across Australia represented the majority (n =11) of the Top 20 LGAs, with Rural Agricultural Small (RAS) being the most common LGA classification (n = 5). This aligns with the Australian concept of the ‘Wagga effect’ used to describe the propensity for high numbers of elite sportspeople deriving from rural and regional areas (Wagga Wagga City Council, 2012) alongside some birthplace effect research (Carlson, 1988). When observing the Top 20, many LGAs had low raw numbers of known individual Olympians and Games representations, yet were successful proportionate to population size. For instance, Narrogin (WA) (n = 2) and Franklin Harbour (SA) (n = 1) both ranked in the highest two places in the Top 20 despite their comparatively small population and known number of Olympic representatives. Despite their high ranking, both these LGAs were deemed inappropriate for the case study analysis, as their small known number of individual Olympians and collective representations had not necessarily demonstrated widespread or long-term success as the EDE for several 1984-2012 Australian summer Olympians.

Based on viable results for conducting a case study analysis, both Nedlands (WA) and Claremont (WA) were respectively ranked as the first and second most consistent LGAs. Initially ranked as the fifth LGA, Bogan Shire (NSW) (n = 1) was not chosen as the third case study LGA also due to low individual Olympic athlete numbers. Accordingly, Cambridge (WA) was chosen as the third case study LGA. Beyond these decisions, there were other factors that identified the Cambridge, Claremont and Nedlands LGAs as the site of the “hotspot” and subsequent case study analysis.
Located in the capital city of Perth, WA, these LGAs were found to border one another which made them stand out even further as a result. Although Peppermint Grove borders Claremont, this LGA was excluded from the “hotspot” due to only one known Olympian deriving from this area, and this individual athlete also shared an EDE with other “hotspot” LGAs. As shown in Table 5.2, a small number of Olympians were associated with 2 or more EDE LGAs, this being due to suburbs shared across LGA councils. This trend was evident for several “hotspot” Olympians, particularly due to school and sports club location. Such outcomes highlight the complexity investigating athlete EDE’s, as various aspects of development (home, school and sport) can be experienced in different places.

Furthermore, based on observations of raw data from Cambridge, Claremont and Nedlands compared to other LGAs in the top 10, it was noted that the three LGAs were deserving of “hotspot” status due to consistent representation in each of the eight Games (1984-2012), across multiple sports. In total, eight Olympic sports were represented by athletes from the “hotspot” including Athletics, Canoe/Kayak, Gymnastics, Hockey, Rowing, Sailing, Swimming and Water Polo. Half (50%) of this cohort competed at two or more Games between 1984-2012, with the overall group of identified “hotspot” Olympians demonstrating a strong performance record when competing at the Games. When considering each individual athlete’s (n = 32) best result for each of the 1984-2012 Games they competed at, most Olympians (75%) were likely to have been a medalist (all colours represented) or finalist based on their best result at a Games, with a minority (25%) attending the Olympics as competitors only.

Further detail of this athlete cohort can be found in the following sections of this chapter and Table 5.4. Using a Maptive heat map, Figure 5.2 illustrates how the combined Cambridge, Claremont and Nedlands “hotspot” shown in red, is prominent in an Australian context when comparing number of Olympic representations to population size. The blue areas (mainly close to capital cities) illustrate LGA’s where a proportionate, yet smaller number of Olympic representatives experienced their early development. Those blue areas on the East Coast particularly, are most noticeable due to the scale of the map, where many LGA’s blend together (as indicated regarding Figure 5.1) despite not being listed in the Top 20 LGA’s as outlined in Table 5.3.
Overall, publicly-available biographical data led to the conclusion that a predominantly male cohort (62.5%) of 32 Australian summer Olympians (1984-2012) had connections with the “hotspot” throughout their early athletic development. Collectively, these Olympians represented the “hotspot” at every Olympics from 1984-2012 for a known total of 52 representations: this included one athlete who was a reserve. The majority of these representations (71.1%) were from Sydney 2000 onwards, with 2008 being the Games with the highest number of representations (n=13) from the “hotspot”. At each Games 1984-2012, the “hotspot” had stronger representation of male athletes, except for 1996 and 2012, in which there were dominant female representatives.

In total, “hotspot” Olympians competed across eight sports: Athletics, Canoe/Kayak, Gymnastics, Hockey, Rowing, Sailing, Swimming and Water Polo. The top three sports by number of Games representations were all water-based sports: swimming (n=12), rowing (n=10) and water polo (n=8). Swimming and athletics were the sports represented across the greatest number of Olympiads (n=6) 1984-2012. Gymnastics and Sailing were predominantly represented by female athletes (100%), whilst Athletics and Hockey had equal (50%) male-female representatives. Table 5.4 provides an overview of the “hotspot” Olympians and a summary of their achievements.
Table 5.4 Overview of 1984-2012 “hotspot” summer Olympians

<table>
<thead>
<tr>
<th>1984-2012 “hotspot” summer Olympians</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Known number of Olympians (individual athletes)</td>
<td>32</td>
<td>20 (62.5%)</td>
<td>12 (37.5%)</td>
</tr>
<tr>
<td>• Known number of Olympic representations (1984-2012)</td>
<td>52</td>
<td>33 (63.5%)</td>
<td>19 (36.5%)</td>
</tr>
<tr>
<td>• By year:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 1984</td>
<td>6 (11.5%)</td>
<td>5 (83.3%)</td>
<td>1 (16.7%)</td>
</tr>
<tr>
<td>• 1988</td>
<td>4 (7.7%)</td>
<td>2 (50%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>• 1992</td>
<td>4 (7.7%)</td>
<td>2 (50%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>• 1996</td>
<td>1 (2%)</td>
<td>0 (0%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>• 2000</td>
<td>6 (11.5%)</td>
<td>4 (66.7%)</td>
<td>2 (33.3%)</td>
</tr>
<tr>
<td>• 2004</td>
<td>9 (17.3%)</td>
<td>8 (88.9%)</td>
<td>1 (11.1%)</td>
</tr>
<tr>
<td>• 2008</td>
<td>13 (25%)</td>
<td>8 (61.5%)</td>
<td>5 (38.5%)</td>
</tr>
<tr>
<td>• 2012</td>
<td>9 (17.3%)</td>
<td>4 (44.4%)</td>
<td>5 (55.6%)</td>
</tr>
<tr>
<td>• Number of Olympic representations (individual athletes)*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 1 Olympic Games</td>
<td>16 (50%)</td>
<td>10 (62.5%)</td>
<td>6 (37.5%)</td>
</tr>
<tr>
<td>• 2 Olympic Games</td>
<td>12 (37.5%)</td>
<td>7 (58.3%)</td>
<td>5 (41.7%)</td>
</tr>
<tr>
<td>• 3 Olympic Games</td>
<td>4 (12.5%)</td>
<td>3 (75%)</td>
<td>1 (25%)</td>
</tr>
<tr>
<td>• Best place achieved at a Games</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Medalist</td>
<td>12 (37.5%)</td>
<td>8 (66.7%)</td>
<td>4 (33.3%)</td>
</tr>
<tr>
<td>- Gold</td>
<td>4 (12.5%)</td>
<td>2 (50%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>- Silver</td>
<td>3 (9.4%)</td>
<td>2 (66.7%)</td>
<td>1 (33.3%)</td>
</tr>
<tr>
<td>- Bronze</td>
<td>5 (15.6%)</td>
<td>4 (80%)</td>
<td>1 (20%)</td>
</tr>
<tr>
<td>• Finalist**</td>
<td>12 (37.5%)</td>
<td>7 (58.3%)</td>
<td>5 (41.7%)</td>
</tr>
<tr>
<td>• Best place medals won as a:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Team***</td>
<td>11 (91.7%)</td>
<td>7 (63.6%)</td>
<td>4 (36.4%)</td>
</tr>
<tr>
<td>• Individual***</td>
<td>3 (25%)</td>
<td>3 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>• Sports represented in the “hotspot” by Olympiad and total number of Games representations by gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Athletics (1984, 1988, 1996, 2000, 2004, 2008)</td>
<td>6 (11.5%)</td>
<td>3 (50%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>• Canoe/Kayak (2000, 2004, 2008)</td>
<td>4 (7.7%)</td>
<td>3 (75%)</td>
<td>1 (25%)</td>
</tr>
<tr>
<td>• Gymnastics (1992, 2008, 2012)</td>
<td>4 (7.7%)</td>
<td>0 (0%)</td>
<td>4 (100%)</td>
</tr>
<tr>
<td>• Hockey (1984, 1988, 1992, 2012)</td>
<td>6 (11.5%)</td>
<td>3 (50%)</td>
<td>3 (50%)</td>
</tr>
<tr>
<td>• Rowing (1984, 2004, 2008, 2012)</td>
<td>10 (19.2%)</td>
<td>7 (70%)</td>
<td>3 (30%)</td>
</tr>
<tr>
<td>• Sailing (2008, 2012)</td>
<td>2 (3.8%)</td>
<td>0 (0%)</td>
<td>2 (100%)</td>
</tr>
<tr>
<td>• Swimming (1984, 1992, 2000, 2004, 2008, 2012)</td>
<td>12 (23.1%)</td>
<td>11 (91.7%)</td>
<td>1 (8.3%)</td>
</tr>
<tr>
<td>• Water Polo (1988, 1992, 2004, 2008, 2012)</td>
<td>8 (15.4%)</td>
<td>6 (75%)</td>
<td>2 (25%)</td>
</tr>
</tbody>
</table>

* Some athletes within this cohort also competed prior to 1984, but these representations were not included for the purpose of this study.
** Finalist, for the purpose of this study, refers to athletes who went beyond the heats or round-robin level of their sport at the Games.
*** Two swimmers’ best place medals were of equal colour in both individual and team events and therefore accounted for twice within the “hotspot” medal tally.
The “hotspot” Olympians could be considered high-achievers based on both their number of individual representations and also their performances at the Games. Whilst 50% of the cohort only went to one Olympic Games, the other 50% competed at two or more Games 1984-2012. Most Olympians were likely to have been a medalist or finalist based on their best result at a Games. 75% of these Olympians were either a medalist or finalist, with a minority (25%) attending the Olympics as competitors only. Gold medalists were equally male and female (50%), whilst a greater number of male athletes (62.5%), compared to female athletes, were competitors only. Although comprising just over one-third (37.5%) of “hotspot” Olympians, female athletes in particular produced strong results, with 75% being medalists or finalists based on their best result at a Games. Of the 12 male and female athletes who were medalists at least once during their 1984-2012 Olympic careers, four won a gold medal, three won silver and five won bronze as their best result at a Games. Majority (91.7%) of these medals were won in a team sport event or relay (swimming), whilst 25% of Olympic medals from the “hotspot” were won individually. Accordingly, the bordering Cambridge, Claremont and Nedlands LGAs were identified as Australia’s 1984-2012 Olympic “hotspot”.

5.2.2 Situating the “hotspot” in an Australian context

5.2.2.1 Overview of Perth, Western Australia (WA) and the “hotspot’s” geographic location

Perth is Australia’s fourth most populous capital city, with an estimated 1.7 million residents in the Greater Metropolitan Area (Australian Bureau of Statistics, 2014a) and known as one of the world’s most low density (Alexander & Greive, 2010) and isolated capital cities in the world (Dowling & McGuirk, 2012). Perth is located in the temperate south-west of Australia (Williams et al., 2012) on the Swan River, with the Indian Ocean bordering to the west (Harvey, 2001). Figure 5.3 illustrates Perth’s geographic location in an Australian context and highlights its isolation from other capital cities.
Perth is well-known for its natural features including pristine beaches, the Swan River, one of the world’s largest inner city parks (Kings Park and Botanic Garden), Rottnest Island and its proximity to several lakes, reserves and parklands (Dragicevich, Chau, & Waters, 2011; Tourism Western Australia, 2014). Access to these natural recreation facilities, a favourable Mediterranean-like climate, a reputation as Australia’s sunniest capital city and low humidity are considered factors conducive to outdoor living, recreation and exercise (Atkinson, Critall, Llewellyn, & Mylne, 2011; Department of State Development, 2011; Glass & Scott, 1999; Pash, 2014).

Over the last 50 years, Perth has undergone significant changes due to an influx of migrants from the United Kingdom and South-East Asia, alongside the prosperity of WA’s mining boom (Dowling & McGuirk, 2012). This has been reflected in the high standard of living, housing and education for Perth’s residents (Department of State Development, 2011), especially those residing in the western suburbs along the beaches and Swan River (Dragicevich et al., 2011; Glass & Scott, 1999). WA is home to some of Australia’s most wealthy families, with Perth particularly reputed to have the highest population of self-made millionaires and boat owners per capita, compared to other capital cities globally (Barton, 2003; Department of State Development, 2011). Many of Australia’s most wealthy, well-educated suburbs are located in Perth’s western suburbs, where the identified “hotspot” is situated. Residents of the Cambridge, Claremont and Nedlands LGAs are amongst Australia’s mostly highly tertiary educated (idblog, 2014) and these LGAs comprise some of Perth’s safest areas based on low rates of crime involving assaults, burglaries, car theft and robberies (Bolton, 2012).
Beyond material wealth, the “hotspot” is also rich in built and natural facilities. At least one suburb in each of the Cambridge, Claremont and Nedlands LGAs borders a significant body of water: either the Indian Ocean or Swan River. Figure 5.4 illustrates the proximity of these LGAs to one another and geographically contextualises the Perth “hotspot”. Predominantly residential, the “hotspot” contains numerous key parklands, recreational and sporting facilities including: WA state centres for three sports (Athletics, Basketball and Rugby Union), Western Australian Institute of Sport (WAIS), beaches (City Beach, Floreat, Swanbourne), aquatic centres (Bold Park, Claremont, HBF Stadium), multi-purpose sports facilities (HBF Stadium, UWA Sports Park, Wembley Sports Park), Swan River, in addition to several key lakes, parks and reserves (Bold Park, Lake Monger, Perry Lakes Reserves, Lake Claremont, Claremont Oval, Cresswell Park, Shenton Bushland). Several local government and private schools and university campuses also provide recreational and sporting facilities for their students (Profile. ID, 2014a, 2014b; Town of Cambridge, 2013).

In part, the “hotspot’s” idyllic town planning can be traced back to the Perth Endowments Land Act 1920 and the vision of influential town clerk William Bold. In 1914, Bold had been on a study tour of Britain and North America to gather innovative ideas about town planning for Greater Perth and during his travels, was exposed to philosophies of the Garden Cities and City Beautiful movements. Upon his return, his ideas for Perth’s development were redefined to embrace satellite garden and seaside suburbs alongside City Beautiful concepts. In the mid-1920’s, architects Hope and Klem were employed to design satellite towns on western seaside endowment lands now known as City Beach and Floreat (Constable, 1998; Garnaut, 2000; Stannage, 2016).
These “hotspot” suburbs (City Beach and Floreat), are Australian examples of the garden suburbs movement which demonstrate the effects of Bold’s tour with their parkways, boulevards, playing fields and gardens (Constable, 1998). Generally, this movement is characterised by a preference for detached dwellings which lend themselves to larger blocks of land and yard space, alongside park-like environments distinguished by tree-lined streets, well-distributed open space and a commitment to preserving natural features (Freestone, 2010; Garnaut, 2000; Karakiewicz, 2015; McManus, 2005). Furthermore, streets were designed in a way to discourage heavy traffic from passing through residential areas to ensure public road safety (Freestone, 1989, 2010; Garnaut, 2000). Fundamentally, the movement placed social, economic and personal wellbeing of residents at the centre of its agenda. It promoted opportunities for fresh air, sunshine, outdoor recreation and proximity to nature as being central to its position in supporting public health (Frank et al., 2003). Such features are considered to differ significantly from modern town planning in newer areas of Perth (Middle, Middle, Smith, & Tye, 2015). Comparisons of Perth’s climate to an Australian context have demonstrated that the “hotspot” experiences ideal weather conditions to make use of these abundant facilities for sporting and recreational purposes.

5.2.2.2 Perth climate compared to the Australian context

Historical data for climate variables was collected for 1967-2002, as this period encompassed 90% of identified 1984-2012 “hotspot” Olympians’ early development years (ages 6-15). A series of tests were conducted on this climate data encompassing descriptive statistics and one-way ANOVA’s as shown in Table 5.5. Full Tukey HSD multiple comparisons can be viewed in Appendix I. At the p <.05 level, Perth’s mean score for:

- minimum daily temperature (°C) (M =12.4, SD = 4.7) [F(7, 102 664) = 17083.5, p = <.001]
- maximum daily temperature (°C) (M = 24.4, SD = 6.3) [F(7, 102 711) =9443.3, p = <.001]
- average daily air temperature (°C) (M = 18, SD = 5.1) [F(7, 102 795) = 14850.8, p = <.001]
- bright sunshine hours (M =8.8, SD = 3.5) [F(7, 64 339) = 455.7, p = <.001]
- mean annual rainfall (M =110, SD =120.8) [F(7, 273) = 133.2, p = <.001]
- mean annual days of rain (M =747.8, SD = 12.7)[F(7, 273) = 26.519, p = <.001]
- mean 9am relative humidity (%) (M =64.1, SD =19) [F(7, 101 501) = 661.5, p = <.001]
- mean 3pm relative humidity (%) (M =46.7, SD =17.6) [F(7, 101 401) = 641.3, p = <.001]
- mean daily wind speed (km/h) (M = 12.4, SD = 6.6) [F(7,102 849) = 1614.8, p = <.001] and
- mean maximum wind gust (M =43.5, SD =14.4)[F(7, 102 013) = 544.7, p = <.001] were all found to be significantly different compared to the rest of Australia.
Based on Perth’s mean minimum (12.4°C), mean maximum (24.4°C) and average daily air temperatures (18°C), the city is warmer than most Australian capital cities. Using a modification of Cohen’s (1988) effect size scale, each of these variables was considered to have a small effect size. Additionally, Perth has the highest mean daily sunshine hours (8.8 hours/day) which equates to approximately 3200 sunshine hours per annum (Bureau of Meteorology, 2014) and is higher than the Australian mean, although was considered trivial in its effect size. Despite Perth’s mean annual rainfall (mm) (M = 747.8, SD = 120.8) being lower than the Australian average of 875mm and recording a moderate effect size, it was not significantly different to the nation’s capital Canberra (M = 618.2, SD = 158.4). Similarly, although Perth had the second lowest mean number days of rain annually (M = 110, SD = 12.7), its climate results for this variable were similar to several other capital cities including Adelaide (M = 119.3, SD = 15), Darwin (M = 114.4, SD = 15.2), Brisbane (M = 120.3, SD = 17) and Canberra (M = 102.6, SD = 18.2), showing only a small effect size.

Partly, these patterns may have contributed to Perth being Australia’s least humid capital city when considering both morning (9am) (M = 64.1, SD = 19) and afternoon (3pm) (M = 46.7, SD = 17.6) relative humidity measures (%). Only other relatively dry capital cities such as Adelaide (M = 64.1, SD = 18.6) and Canberra (M = 47, SD = 18) were similar to Perth on morning and afternoon measures respectively, although overall there was trivial effect size for both measures. In part, Perth’s low humidity may be due to the ‘Fremantle Doctor’, a sea breeze blowing from the south-west to counteract hot north-easterly winds especially during the summer months (Williams et al., 2012). Although Perth’s mean daily wind speed (12.4 km/h) was just below the national mean (12.9km/h) with trivial effect size, Perth’s mean maximum daily wind gusts (km/h) (M = 43.5, SD = 14.4) were above the national mean (42.5km/h), also with trivial effect size and were significantly different to most capital cities aside from Hobart (M = 44, SD = 16.8) and Sydney (M = 44, SD = 16.1). Overall, this data appears to support Perth’s reputation as having a favourable Mediterranean climate and being Australia’s sunniest capital city (Department of State Development, 2011). Accordingly, it could be inferred that Perth’s temperate climate may be beneficial for outdoor recreation, training and athlete development.
Table 5.5 Aspects of Australian climate reported by capital cities

<table>
<thead>
<tr>
<th>Aspect</th>
<th>Perth, WA</th>
<th>Darwin, NT</th>
<th>Adelaide, SA</th>
<th>Brisbane, QLD</th>
<th>Sydney, NSW</th>
<th>Melbourne, VIC</th>
<th>Hobart, TAS</th>
<th>Canberra, ACT</th>
<th>Australian capital city mean</th>
<th>F (Between groups)</th>
<th>p</th>
<th>Effect size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean minimum temperature (°C)*</td>
<td>12.4</td>
<td>(SD=4.7)</td>
<td>11.4</td>
<td>15.7</td>
<td>13.6</td>
<td>9.4</td>
<td>8.1</td>
<td>6.6</td>
<td>12.6</td>
<td>17083.484</td>
<td>&lt;.001</td>
<td>.538</td>
</tr>
<tr>
<td>Mean maximum temperature (°C)*</td>
<td>24.4</td>
<td>(SD=6.3)</td>
<td>21.4</td>
<td>25.4</td>
<td>22.3</td>
<td>19.5</td>
<td>17.5</td>
<td>19.7</td>
<td>22.8</td>
<td>9443.316</td>
<td>&lt;.001</td>
<td>.391</td>
</tr>
<tr>
<td>Average daily air temperature (°C)</td>
<td>18</td>
<td>(SD=5.1)</td>
<td>27.2</td>
<td>16.2</td>
<td>20.1</td>
<td>17.7</td>
<td>14</td>
<td>12.9</td>
<td>17.3</td>
<td>14850.797</td>
<td>&lt;.001</td>
<td>.502</td>
</tr>
<tr>
<td>Bright sunshine hours</td>
<td>8.8</td>
<td>(SD=3.5)</td>
<td>8.5</td>
<td>7.6</td>
<td>7.2</td>
<td>6.3</td>
<td>6.3</td>
<td>7.6</td>
<td>7.5</td>
<td>455.723</td>
<td>&lt;.001</td>
<td>.047</td>
</tr>
<tr>
<td>Mean annual rainfall (mm)</td>
<td>747.8</td>
<td>(SD=120.8)</td>
<td>1805.3</td>
<td>456.9</td>
<td>1207.2</td>
<td>1106.6</td>
<td>550</td>
<td>618.2</td>
<td>875</td>
<td>133.150</td>
<td>&lt;.001</td>
<td>.773</td>
</tr>
<tr>
<td>Mean annual days of rain</td>
<td>110</td>
<td>(SD=12.7)</td>
<td>114.36</td>
<td>119.3</td>
<td>120.3</td>
<td>128</td>
<td>141.3</td>
<td>139.4</td>
<td>102.6</td>
<td>121.7</td>
<td>&lt;.001</td>
<td>.404</td>
</tr>
<tr>
<td>Mean 9am relative humidity (%)</td>
<td>64.1</td>
<td>(SD=19)</td>
<td>70.9</td>
<td>64.1</td>
<td>66.4</td>
<td>68.6</td>
<td>73</td>
<td>73.1</td>
<td>68.8</td>
<td>661.475</td>
<td>&lt;.001</td>
<td>.043</td>
</tr>
<tr>
<td>Mean 3pm relative humidity (%)</td>
<td>46.7</td>
<td>(SD=17.6)</td>
<td>53.6</td>
<td>52.4</td>
<td>55.5</td>
<td>56.2</td>
<td>54.3</td>
<td>47</td>
<td>52.7</td>
<td>641.301</td>
<td>&lt;.001</td>
<td>.042</td>
</tr>
<tr>
<td>Mean daily wind speed (km/h)</td>
<td>12.4</td>
<td>(SD=6.6)</td>
<td>10.5</td>
<td>15.1</td>
<td>11.1</td>
<td>13.6</td>
<td>17.1</td>
<td>13.7</td>
<td>9.7</td>
<td>1614.840</td>
<td>&lt;.001</td>
<td>.099</td>
</tr>
<tr>
<td>Mean maximum wind gust (km/h)</td>
<td>43.5</td>
<td>(SD=14.4)</td>
<td>39.6</td>
<td>37.8</td>
<td>44</td>
<td>47.7</td>
<td>44</td>
<td>40.3</td>
<td>42.5</td>
<td>544.702</td>
<td>&lt;.001</td>
<td>.036</td>
</tr>
</tbody>
</table>
5.2.2.3 “Hotspot” demographics compared to an Australian context

As Table 5.6 demonstrates, demographic variables pertaining to the “hotspot” differ to several Australian and Perth means. Compared to Australia overall (76.8%) and greater Perth (77.6%), “hotspot” residents (83%) are most likely to speak English as their predominant language within the home environment. Residents from the “hotspot” however, are less likely to have been born in Australia (64.3%) or be Australian citizens (83.6%) compared to the national mean (69.8% Australian-born and 85% Australian citizens), yet are still more likely than greater Perth to be Australian-born (59.4%) or Australian citizens (80%). Compared to both Australian (2.5%) and Perth (1.5%) means, the “hotspot” has a much lower Aboriginal and Torres Strait Islander population (0.3%).

When observing the average population of Australian (n=39, 272) and greater Perth (n= 56, 185) LGA’s, Cambridge (n=24, 965), Claremont (n=9, 280) and Nedlands (n= 20, 534) have traditionally had smaller populations, which was also represented in the 2011 Census. This is not uncommon for WA given LGAs have historically been much smaller than in other Australian capital cities. The existence of these smaller populations is further emphasised by evidence that an inverse correlation exists between council population size and SES, due to older areas of Perth (like the Western Suburbs) being more conservative and opposed to amalgamation. Residents in these areas are likely to be well-educated and articulate, which grants the ability to influence prevention over proposed LGA boundary changes (Jones, 2009).

Within the “hotspot”, median weekly household income ($AUD 2,188), median age (40.3 years), private homes owned outright (58.8%), rates of non-government secondary schooling (59.7%) and resident over 15 years holding a tertiary education qualification (59.9%), were all much higher than Perth and Australian means as shown in Table 5.6, with the frequency of government secondary schooling being much lower (19.1%). Although not as vastly different to Australian (53.7%) and Perth (58.6%) means, youth employment rates (15-24 years) within the “hotspot” (52.9%) were lower. Similarly, “hotspot” residents attending secondary Catholic schools (21%), was lower compared to the rest of Perth (25.8%) or Australia (23%). Collectively, these factors provide evidence for a high SES and financially stable “hotspot”, which differentiates it from greater Perth and Australia across several demographic variables.
Beyond financial measures, the demographic data could also be interpreted as portraying a stable, family-oriented “hotspot”. Compared to Australian and Perth means, this was evident through higher percentages of couple families with children (50.1%) and fewer instances of one-parent families (11%). Furthermore, compared to the Australian average (75.6%) the overall “hotspot” is comprised of a slightly greater percentage of detached houses (76.6%). Although the Claremont LGA lowers the “hotspot” average with only 65% of occupied private dwellings being detached houses, when the LGAs are observed separately, Cambridge (79.8%) and especially Nedlands (85%), LGA had a higher proportion of detached housing compared to the rest of Australia or Perth (78.1%) in 2011. Finally, the “hotspot” may be evidenced as community-minded with the percentage of residents 15 and over engaging in volunteering with much greater frequency (26.1%) than other areas of Perth (15.7%) or Australia (17.8%).
### Table 5.6 Comparison of “hotspot” demographic variables to the Australian average

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>LGA population size</td>
<td>39,272*</td>
<td>56,185**</td>
<td>24,965</td>
<td>9,280</td>
<td>20,534</td>
<td>54,779</td>
</tr>
<tr>
<td>Median age (years)</td>
<td>37</td>
<td>36</td>
<td>39</td>
<td>41</td>
<td>41</td>
<td>40.3</td>
</tr>
<tr>
<td>Median weekly household income ($AUD)</td>
<td>1,234</td>
<td>1,454</td>
<td>2,285</td>
<td>1,789</td>
<td>2,490</td>
<td>2,188</td>
</tr>
<tr>
<td>Occupied private dwelling with a mortgage - Home owned outright (%)</td>
<td>47.9</td>
<td>42.8</td>
<td>54</td>
<td>62</td>
<td>60.5</td>
<td>58.8</td>
</tr>
<tr>
<td>Occupied private dwelling – separate house (%)</td>
<td>75.6</td>
<td>78.1</td>
<td>79.8</td>
<td>65</td>
<td>85</td>
<td>76.6</td>
</tr>
<tr>
<td>Secondary school students: Government (%)</td>
<td>57.9</td>
<td>48.2</td>
<td>26.6</td>
<td>13.3</td>
<td>17.5</td>
<td>19.1</td>
</tr>
<tr>
<td>Secondary school students: Non-government (Private) (%)</td>
<td>19.1</td>
<td>26</td>
<td>44.2</td>
<td>72.3</td>
<td>62.5</td>
<td>59.7</td>
</tr>
<tr>
<td>Secondary school students: Catholic (%)</td>
<td>23</td>
<td>25.8</td>
<td>29.3</td>
<td>13.9</td>
<td>19.9</td>
<td>21</td>
</tr>
<tr>
<td>Non-school qualification: tertiary education (15 and over)(%)</td>
<td>45</td>
<td>47</td>
<td>61.3</td>
<td>58</td>
<td>60.3</td>
<td>59.9</td>
</tr>
<tr>
<td>Couple family with children (%)</td>
<td>44.6</td>
<td>45.4</td>
<td>53.3</td>
<td>42</td>
<td>55</td>
<td>50.1</td>
</tr>
<tr>
<td>One-parent family (%)</td>
<td>15.9</td>
<td>14.7</td>
<td>9</td>
<td>13.6</td>
<td>10.3</td>
<td>11</td>
</tr>
<tr>
<td>Volunteered within last 12 months in an organization (15 and over)(%)</td>
<td>17.8</td>
<td>15.7</td>
<td>24.5</td>
<td>25.8</td>
<td>28</td>
<td>26.1</td>
</tr>
<tr>
<td>Born in Australia (%)</td>
<td>69.8</td>
<td>59.4</td>
<td>66.8</td>
<td>63</td>
<td>63.2</td>
<td>64.3</td>
</tr>
<tr>
<td>Aboriginal and Torres Strait Islander (%)</td>
<td>2.5</td>
<td>1.5</td>
<td>0.2</td>
<td>0.4</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Australian citizen (%)</td>
<td>85</td>
<td>80</td>
<td>85.6</td>
<td>80.6</td>
<td>84.7</td>
<td>83.6</td>
</tr>
<tr>
<td>Speak English only at home (%)</td>
<td>76.8</td>
<td>77.6</td>
<td>84.1</td>
<td>82.2</td>
<td>82.8</td>
<td>83</td>
</tr>
<tr>
<td>Youth employment (15-24 years)(%)</td>
<td>53.7</td>
<td>58.6</td>
<td>58.1</td>
<td>49.2</td>
<td>51.5</td>
<td>52.9</td>
</tr>
</tbody>
</table>

* Size of the average Australian LGA (Gooding, 2012)
** Average LGA size in the Greater Perth area (ABS, 2011)
*** Combined “hotspot” population size based on 2011 Census data
5.3 Conclusion

This study sought to identify a “hotspot” of 1984-2012 Australian summer Olympic representatives relative to population size (per 100,000). Structured around the exosystem level of Bronfenbrenner’s (1979b) EST, it further aimed to situate this “hotspot” within an Australian context through investigation of several climatic and demographic variables. Through internet and archival data collection, Study 1 identified a “hotspot” of 1984-2012 summer Olympians located in the affluent western suburbs of Perth, Western Australia. Additionally, it was determined that the “hotspot” differed to national means across several climatic and demographic factors, some of which may have the potential to positively influence athlete development.
Chapter 6
Study 2 – Olympians’ and community perceptions of the “hotspot”

Note: This study was funded in part by a PhD Students Research Grant (CHF 4000) from the International Olympic Committee (IOC) (2015). The following chapter comprises Olympians’ perceptions of the “hotspot” based on discussion from the report submitted to the IOC Olympic Studies Centre in fulfilment of this grant.

6.1 Introduction

The aim of the second study of this project was to qualitatively investigate both Olympians’ and community perceptions of how an Australian sporting “hotspot” located in the affluent western suburbs of Perth, WA was created. Additionally, through the lens of Bronfenbrenner’s Ecological Systems Theory (EST) (1979b), it sought to determine how the “hotspot” as an early developmental environment may have influenced the early development and subsequent success of Olympians’ whose early athletic development took place within this environment. To address these aims and triangulate the results of Study 1, Study 2 addressed the following two research questions:

1. What are the community’s perceptions of how the “hotspot” was created and how influential do they think this early developmental environment was to the subsequent sporting success of local Olympians?

2. How do Australian Olympians retrospectively perceive the influence of the “hotspot” and its contribution to their early athletic development and subsequent sporting success?
6.2 Results and discussion

6.2.1 Participant profile

As viewed in Table 6.1, semi-structured interviews were used in Study 2 to address research questions 1 and 2 by drawing upon the perspectives of 42 individuals from the “hotspot” sporting community. This included 11 Olympians and 31 key stakeholders from the broader community. Just over half of all participants were male (54.8%), although females comprised the dominant cohort (63.6%) when observing Olympian interviewees only. Collectively, community and Olympian participants represented a range of age-based cohorts from teenagers to adults in their sixties. Participants in their 40’s were the largest cohort (50%), followed by those in their 30’s (14.3%) and 50’s (12%). Although in the minority, female viewpoints were represented by both community participants, Olympians and across all age ranges by decade, apart from 60’s.

Table 6.1 Study 2 semi-structured interview participant profile

<table>
<thead>
<tr>
<th>Overview of “hotspot” Olympians and community participants by age and gender</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total number of interview participants by gender</td>
<td>42</td>
<td>23 (54.8%)</td>
<td>19 (45.2%)</td>
</tr>
<tr>
<td>By type:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olympians</td>
<td>11 (26.2%)</td>
<td>4 (36.4%)</td>
<td>7 (63.6%)</td>
</tr>
<tr>
<td>Community</td>
<td>31 (73.8%)</td>
<td>19 (61.3%)</td>
<td>12 (38.7%)</td>
</tr>
<tr>
<td>Age range by decade:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Teens</td>
<td>3 (7.1%)</td>
<td>1 (33.3%)</td>
<td>2 (66.7%)</td>
</tr>
<tr>
<td>20’s</td>
<td>4 (9.5%)</td>
<td>1 (25%)</td>
<td>3 (75%)</td>
</tr>
<tr>
<td>30’s</td>
<td>6 (14.3%)</td>
<td>5 (83.3%)</td>
<td>1 (16.7%)</td>
</tr>
<tr>
<td>40’s</td>
<td>21 (50%)</td>
<td>10 (47.6%)</td>
<td>11 (52.4%)</td>
</tr>
<tr>
<td>50’s</td>
<td>5 (12%)</td>
<td>3 (60%)</td>
<td>2 (40%)</td>
</tr>
<tr>
<td>60’s</td>
<td>3 (7.1%)</td>
<td>3 (100%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>

* Age range by decade provided rather than actual range, for privacy reasons
Table 6.2 provides a summary of “hotspot” Olympians who participated in Study 2. In total, 11 “hotspot” Olympians from the sports of athletics, canoe/kayak, gymnastics, hockey and swimming were interviewed. Collectively, these interviewed Olympians comprised 34% of the individual athletes (n= 32) known to be from the “hotspot” and between them had accumulated n = 19 or 36.5%, of the “hotspot’s” total 1984-2012 Games representations (n = 52). Although the majority (62.5%) of individual “hotspot” Olympians were male, female athletes comprised a greater percentage (58.8%) of individual “hotspot” Olympians who were interviewed for this study. These outcomes were based on relationships made with key community or sport-specific ‘gatekeepers’ made over the course of the study alongside Olympians’ availability and willingness to partake. Hockey and gymnastics were the sport’s most strongly represented in Study 2, with each comprising over one-quarter of Olympians’ responses (27.3%) and having a larger involvement from female interviewee’s. Swimming was the only Olympic sport represented by the “hotspot” which had a greater percentage (100%) of male to female interviewee’s, whilst athletics and canoe/kayak represented parity across Olympians of both genders. Collectively, “hotspot” Olympians from all Games 1984-2012 were represented within this study, with the majority of athlete’s representations (68.5%) taking place from 2000 onwards. Of the interviewees, males were most strongly represented for the 1984, 2000 and 2004 Games, with representatives from the 1992, 1996 and 2012 Games comprising predominantly female. The 1988 and 2008 Games comprised equitable male and female interviewees.
Table 6.2 Study 2 “hotspot” Olympians – an overview

Overview of “hotspot” Olympians who participated in Study 2

<table>
<thead>
<tr>
<th>Category</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall “hotspot” representations (1984-2012)</td>
<td>52 (100%)</td>
<td>33 (63.5%)</td>
<td>19 (36.5%)</td>
</tr>
<tr>
<td>Overall individual “hotspot” Olympians (1984-2012)</td>
<td>32 (100%)</td>
<td>20 (62.5%)</td>
<td>12 (37.5%)</td>
</tr>
<tr>
<td>Number of Olympic representations accumulated by interviewed “hotspot” Olympians (1984-2012)</td>
<td>19 (100%)</td>
<td>10 (52.6%)</td>
<td>9 (47.4%)</td>
</tr>
<tr>
<td>Individual “hotspot” Olympians interviewed</td>
<td>11 (100%)</td>
<td>4 (20%)</td>
<td>7 (58.3%)</td>
</tr>
<tr>
<td>Olympian interviewee's by sport compared to total interviewed cohort</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- Athletics</td>
<td>2 (18.2%)</td>
<td>1 (50%)</td>
<td>1 (50%)</td>
</tr>
<tr>
<td>- Canoe/Kayak</td>
<td>2 (18.2%)</td>
<td>1 (50%)</td>
<td>1 (50%)</td>
</tr>
<tr>
<td>- Gymnastics</td>
<td>3 (27.3%)</td>
<td>0 (0%)</td>
<td>3 (100%)</td>
</tr>
<tr>
<td>- Hockey</td>
<td>3 (27.3%)</td>
<td>1 (33.3%)</td>
<td>2 (66.7%)</td>
</tr>
<tr>
<td>- Rowing</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>- Sailing</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>- Swimming</td>
<td>1 (9.1%)</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>- Water Polo</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Interviewee's representations by years competed at a Games</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>- 1984</td>
<td>1 (5.3%)</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>- 1988</td>
<td>2 (10.5%)</td>
<td>1 (50%)</td>
<td>1 (50%)</td>
</tr>
<tr>
<td>- 1992</td>
<td>2 (10.5%)</td>
<td>0 (0%)</td>
<td>2 (100%)</td>
</tr>
<tr>
<td>- 1996</td>
<td>1 (5.3%)</td>
<td>0 (0%)</td>
<td>1 (100%)</td>
</tr>
<tr>
<td>- 2000</td>
<td>4 (21.1%)</td>
<td>3 (75%)</td>
<td>1 (25%)</td>
</tr>
<tr>
<td>- 2004</td>
<td>3 (15.8%)</td>
<td>3 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>- 2008</td>
<td>4 (21.1%)</td>
<td>2 (50%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>- 2012</td>
<td>2 (10.5%)</td>
<td>0 (0%)</td>
<td>2 (100%)</td>
</tr>
</tbody>
</table>
Table 6.3 shows that “hotspot” community stakeholders comprised the majority (n = 31) of the 42 participants involved with Study 2. Compared to Olympians, community stakeholders were predominantly represented by males (61.3%). Parents of current elite junior and senior athletes were the category of community stakeholder most strongly represented by females (85.7%), whilst 100% of local government or council interview participants were male. Interviewee’s encompassed all targeted participant categories, with club committee members and high performance sports administrators (21.4%), coaches (19%), and parents (16.7%) of elite athletes being the most prominent groups of community stakeholders; the majority (90.3%) were affiliated with a specific sports club. All sports affiliated with “hotspot” Olympic representations aside from sailing were represented by community stakeholders, with Hockey comprising the greatest number of participants (n=17). An alphabetised and detailed overview of individual Olympians and community participants can be viewed in Appendix J, which outlines their role within the “hotspot” and provides background to their perspectives. Pseudonym names and approximate age ranges have been provided for privacy reasons.

Table 6.3 *Study 2 community stakeholders – an overview*

<table>
<thead>
<tr>
<th>Overview of “hotspot” community stakeholders who were involved in Study 2</th>
<th>Total</th>
<th>Male</th>
<th>Female</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Overall community stakeholders</td>
<td>31 (100%)</td>
<td>19 (61.3%)</td>
<td>12 (38.7%)</td>
</tr>
<tr>
<td>- Current elite junior and senior athletes</td>
<td>4 (9.5%)</td>
<td>2 (50%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>- Parents of current elite junior and senior athletes</td>
<td>7 (16.7%)</td>
<td>1 (14.3%)</td>
<td>6 (85.7%)</td>
</tr>
<tr>
<td>- Coaches of current elite junior and senior athletes</td>
<td>8 (19%)</td>
<td>6 (75%)</td>
<td>2 (25%)</td>
</tr>
<tr>
<td>- Club committee members and high performance sports administrators</td>
<td>9 (21.4%)</td>
<td>7 (77.8%)</td>
<td>2 (22.2%)</td>
</tr>
<tr>
<td>- Members of local government or council (i.e. mayor)</td>
<td>3 (7.1%)</td>
<td>3 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>• Community stakeholders affiliated with a sport</td>
<td>28 (90.3%)</td>
<td>16 (84.2%)</td>
<td>12 (100%)</td>
</tr>
</tbody>
</table>

• Community stakeholders by sport compared to total interviewed cohort*:  
  - Athletics | 1 (3.6%) | 0 (0%) | 1 (100%) |
  - Canoe/Kayak (Surf lifesaving) | 3 (10.7%) | 1 (33.3%) | 2 (66.7%) |
  - Gymnastics | 1 (3.6%) | 0 (0%) | 1 (100%) |
  - Hockey | 17 (60.7%) | 11 (64.7%) | 6 (35.3%) |
  - Rowing | 1 (3.6%) | 1 (100%) | 0 (0%) |
  - Sailing | 0 (0%) | 0 (0%) | 0 (0%) |
  - Swimming | 3 (10.7%) | 2 (66.7%) | 1 (33.3%) |
  - Water Polo | 2 (7.1%) | 1 (50%) | 1 (50%) |

* Excludes 3 council participants

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6.2.2 Overview of Study 2 results according to the EST by theme

Table 6.4 provides an overview of the structure of Study 2 results discussed within this chapter. The final 21 key themes and 24 sub-themes presented were eventually narrowed down from 86 parent nodes and 244 child nodes in the first stage of NVivo coding. This process of analysis was undertaken with the assistance of 50 NVivo memos which allowed for ongoing reflection, analysis and reduction of large numbers of nodes into key themes throughout the coding process. In each stage of coding and below, NVivo nodes or themes respectively were aligned with ‘umbrella’ themes dictated by the framework of Bronfenbrenner’s EST (1979b) and demonstrate how his theory has been interpreted for the context of this study. Through abductive reasoning, ‘chance, happenstance and other circumstantial factors’ was an ‘umbrella’ theme that was identified through the research diary kept during the interview and early transcription process. Accordingly, it was then made an adjacent extension of Bronfenbrenner’s framework due to its influence on several outcomes of this study and was explored further throughout analysis.

In the following table, each of the qualitative themes framed on the final set of NVivo nodes is paired with a quantitative presentation of references drawn from all NVivo parent and child nodes, which filtered into the narrowed list of themes and sub-themes presented. These references represent the number of interview segments that were coded to particular parent or child nodes within a theme and in several cases, segments of interview data were simultaneously relevant to multiple nodes depending on their content.

The overall number of references pertaining to a particular qualitative theme is shown with inclusion of comparisons between community and Olympians’ interview data. When interpreting data in the below table, it is important to consider that the quantitative measures related to each theme are intended to provide an overview of the NVivo analysis process only and must be taken in consideration with qualitative interpretations of data. For instance, 31 community stakeholders were interviewed compared to 11 Olympians and the references applicable to the former are more heavily weighted in number for several themes. Participant background had significant influence on the information provided in interviews, thus, also affecting themes and reference numbers. For instance, ‘club culture and spirit’ was referenced 495 by community stakeholders compared to 95 times by Olympians; unsurprising given majority were actively involved in sports clubs within the “hotspot”. Furthermore, age, long term involvement in the “hotspot” and occupation (i.e. mayor) are some other examples of factors that may have led to some participants from the community being more knowledgeable about town planning and historical factors for instance, compared to the relatively younger Olympians interviewed.
Themes pertaining to the mesosystem and chance also had some challenges in their quantification, as they arose from crossover between several different nodes, not just references directly coded to them. Themes in both these areas were more common than they appear, with mesosystem factors arising from observed relationship between various microsystem sub-themes and ‘a series of planned and fortuitous factors coming together’ coming from overall impressions, alongside comments made directly by participants. The final qualitative outcomes of these themes became most apparent once coding was complete, in conjunction to the reflections recorded in NVivo memos and the research diary.

Accordingly, the presentation of Study 2 results within this chapter will simultaneously investigate Olympians’ and community perceptions through the lens of the themes and sub-themes provided in Table 6.4. This is to enable their triangulation alongside allowing for a comprehensive understanding of the “hotspot” to be obtained, with consideration to its identity as a historically successful early talent development environment of 1984-2012 summer Olympians.
Table 6.4 Qualitative themes in accordance with the levels of Bronfenbrenner’s (1979) Ecological Systems Theory (EST)

<table>
<thead>
<tr>
<th>&quot;Umbrella&quot; themes (All references)*</th>
<th>Study 2 qualitative themes from final NVivo nodes</th>
<th>References from NVivo codes*</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Individual</strong> (215)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Sports history</td>
<td>83 (21, 62)</td>
<td></td>
</tr>
<tr>
<td>• Personal characteristics contributing to athletic success</td>
<td>132 (54, 78)</td>
<td></td>
</tr>
<tr>
<td><strong>Microsystem</strong> (1984)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Family</td>
<td>367 (211, 156)</td>
<td></td>
</tr>
<tr>
<td>- Family ‘type’</td>
<td>178 (109, 69)</td>
<td></td>
</tr>
<tr>
<td>- Family resources (mental-emotional, financial and logistical)</td>
<td>189 (102,87)</td>
<td></td>
</tr>
<tr>
<td>• Training environment and community sports clubs</td>
<td>1204 (976, 228)</td>
<td></td>
</tr>
<tr>
<td>- Club culture and spirit</td>
<td>590 (495, 95)</td>
<td></td>
</tr>
<tr>
<td>- Coaches and coaching style</td>
<td>167 (111, 56)</td>
<td></td>
</tr>
<tr>
<td>- Mentors and role models</td>
<td>185 (146, 39)</td>
<td></td>
</tr>
<tr>
<td>- Opportunity to train and compete against older athletes or in a co-ed environment</td>
<td>179 (151,28)</td>
<td></td>
</tr>
<tr>
<td>- Financial support and fundraising</td>
<td>83 (73, 10)</td>
<td></td>
</tr>
<tr>
<td>• Schools</td>
<td>402 (295, 109)</td>
<td></td>
</tr>
<tr>
<td>- Early introduction to sport</td>
<td>36 (8, 28)</td>
<td></td>
</tr>
<tr>
<td>- Access to facilities</td>
<td>53 (43, 10)</td>
<td></td>
</tr>
<tr>
<td>- School-based sports competition and coaching</td>
<td>287 (240,47)</td>
<td></td>
</tr>
<tr>
<td>- Logistical support and flexibility for elite athletes</td>
<td>15 (4, 13)</td>
<td></td>
</tr>
<tr>
<td>• Peers</td>
<td>11 (0, 11)</td>
<td></td>
</tr>
<tr>
<td><strong>Mesosystem</strong> (26)**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Family (parent) – training environment (coach) relationship**</td>
<td>6 (4, 2)</td>
<td></td>
</tr>
<tr>
<td>• School – community club (training environment) relationship**</td>
<td>20 (15, 5)</td>
<td></td>
</tr>
<tr>
<td><strong>Exosystem</strong> (1644)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Local councils and historical town planning</td>
<td>152 (134, 18)</td>
<td></td>
</tr>
<tr>
<td>• Demographic of the “hotspot” area</td>
<td>386 (273, 113)</td>
<td></td>
</tr>
<tr>
<td>• Physical environment (built)</td>
<td>393 (319, 74)</td>
<td></td>
</tr>
<tr>
<td>- Access to built facilities</td>
<td>314 (258, 56)</td>
<td></td>
</tr>
<tr>
<td>- Roads and traffic</td>
<td>38 (34, 4)</td>
<td></td>
</tr>
<tr>
<td>- Backyard and block of land size</td>
<td>41 (27, 14)</td>
<td></td>
</tr>
<tr>
<td>• Physical environment (Natural)</td>
<td>143 (106, 37)</td>
<td></td>
</tr>
<tr>
<td>- Access to natural facilities</td>
<td>143 (106, 37)</td>
<td></td>
</tr>
<tr>
<td>• Social environment</td>
<td>99 (65, 34)</td>
<td></td>
</tr>
<tr>
<td>- Perceptions of safety, a sense of community and shared values</td>
<td>99 (65, 34)</td>
<td></td>
</tr>
<tr>
<td>• Key organisations</td>
<td>366 (243, 123)</td>
<td></td>
</tr>
<tr>
<td>- The University of Western Australia (UWA)</td>
<td>44 (41, 3)</td>
<td></td>
</tr>
<tr>
<td>- Western Australian Institute of Sport (WAIS)</td>
<td>263 (158, 105)</td>
<td></td>
</tr>
<tr>
<td>- Australian Institute of Sport (AIS) hockey based in Perth</td>
<td>59 (44, 15)</td>
<td></td>
</tr>
<tr>
<td>• Western Australia (WA)</td>
<td>30 (6, 24)</td>
<td></td>
</tr>
<tr>
<td>• Broader political influences in WA</td>
<td>75 (42, 33)</td>
<td></td>
</tr>
<tr>
<td>- Daylight saving</td>
<td>36 (22, 14)</td>
<td></td>
</tr>
<tr>
<td>- Restricted shopping hours</td>
<td>32 (17, 15)</td>
<td></td>
</tr>
<tr>
<td>- School system in WA</td>
<td>7 (3,4)</td>
<td></td>
</tr>
<tr>
<td><strong>Macrosystem</strong> (131)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Role of the Olympics and sport in the Australian national identity</td>
<td>131 (80, 51)</td>
<td></td>
</tr>
<tr>
<td><strong>Chronosystem</strong> (44)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Key historical events</td>
<td>44 (36, 8)</td>
<td></td>
</tr>
<tr>
<td>- Sporting events</td>
<td>28 (23, 5)</td>
<td></td>
</tr>
<tr>
<td>- Partition of India and migration</td>
<td>16 (13, 3)</td>
<td></td>
</tr>
<tr>
<td><strong>Beyond the EST: Chance, happenstance and other circumstantial factors (111)</strong></td>
<td>69 (34, 35)</td>
<td></td>
</tr>
<tr>
<td>• Climate and geographic good fortune</td>
<td>42 (21, 21)</td>
<td></td>
</tr>
<tr>
<td>• Exposure to sporting opportunities</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>- A series of planned and fortuitous factors coming together**</td>
<td>-</td>
<td></td>
</tr>
</tbody>
</table>

* Comprises references from all NVivo parent and child nodes pertaining to final sub-themes
** These themes were difficult to quantify as they arose from crossover between several different nodes, not just references directly pertaining to them so were more common than they appear
6.2.3 Individual

Humans are active agents in their own development (Heckhausen & Shane, 2015) and Olympians are no exception. Their sports history and character traits have potential to influence development and success on a personal level, while directly or indirectly influencing factors at other levels of the EST (Bronfenbrenner, 1979b).

6.2.3.1 Sports history

Most Olympians’, junior and senior elite athletes had been involved in multiple sports throughout their childhood and adolescence prior to specialising in their main sport. Although gymnasts had specialised at a young age, they too, had some involvement in other sporting activities, either at school or through organised sport in early childhood. Early diversification not only exposed the “hotspot’s” Olympians’ and elite athletes to several sports before finding one they were best suited to, it also allowed for skill transferability in a range of areas including coordination, teamwork, water familiarity and game sense.

“I did Kindergym when I was very little and then obviously did some sports at school…I did tennis for a bit, table tennis…outside of school I did dancing and ballet and all that sort of stuff.” (Lucy, Gymnastics)

“I played soccer [football] before…so the coordination it was sort of already there...because being goal keeper [in hockey] has a lot to with your feet…I just sort of put it together.” (Jesse, junior elite athlete)

“…she realized water polo was what she wanted to do. Before that she was doing netball, basketball…she’s been at the surf life [saving] club and she could have also been a [competitive] swimmer.” (Gina, parent of junior and senior elite athletes)

Such findings support prior research, adhering to the benefits of early diversification in early athletic development (Bridge & Toms, 2013; Côté & Vierimaa, 2014; Güllich, 2014), alongside the anecdotal views of elite athletics coach Loretta, who believed that “You have to be an all-round type of athlete before you start specialising”. Often, these experiences took place within schools and community clubs, with parents, siblings, neighbours and friends being key influences on involvement.

“The reason I first went was because my next door neighbour was a gymnast…she used to do gym with me in the backyard…I just wanted to go with her and I loved it from the very beginning.” (Monica, Gymnastics)
“I think it was quite informal how I started because I've actually got three older brothers, so they all played and I just mucked around with them” (Felicity, Hockey)

“I started hockey when I was 4 or 5. My siblings did it. I had an older sister and she did it for school…So I wanted to be like my sister and I was like "I want to play hockey!"” (Angela, junior elite athlete)

Alongside organised sports experiences, unstructured practice or deliberate play, were also common within Olympians’ and elite athletes childhoods within the “hotspot” and shared similarities with other retrospective studies (Baker & Côté, 2006; Gulbin et al., 2010).

“He [son who is a prospective elite hockey player] was very, very independent. He would find somebody who would go cycle with him. They would cycle to McGillivray, climb over the barbed wire fence and go to the turf. He did it all the time. He did it all summer and just practiced his hockey…it was just him playing. I didn't consider it [unstructured play] to be [part of] him becoming an elite hockey player.” (Karen, parent of senior elite athlete)

“She (Felicity - “hotspot” Olympian) used to play hockey and soccer and cricket and tennis and everything in this games room, so I suspect that’s probably where they (Felicity and siblings) developed really good hand-eye coordination…at home, day and night, all weekend and I feel that helped.” (Colin, club committee member and parent of Olympian)

“I knocked out my 10,000 hrs you know, I probably did 4 [000] of them in the backyard.” (Ray, Hockey)

These experiences can allow children to develop passion for an activity (Oakley, 2014) and establish several motor and cognitive experiences (Côté et al., 2009), particularly when siblings are involved (Hodge et al., 2012; Weissensteiner et al., 2009). Additionally, experiences such as Rhyse’s (below), appear to share similarities with experiential learning; a continual cycle of reflecting, learning and experimentation takes place within such a framework, in conjunction with an individual’s problem-solving abilities, so that deeper learning can occur (Kolb, 1984).
“...in WA [as a teenager] there were no coaches. We always used to team up [to train] with a like-minded individual and I actually think it was quite beneficial growing up like that. I think it taught you how to be quite analytical about what you’re doing...You're actually better off at a younger age not being coached because you learn all those skills yourself and you have the ability to learn different things outside the box. At the same time that I learned how to kayak I learned how to surf. My sport was probably a bit more like surfing in terms of the skills you’ve got to acquire skills in the white water. So you’re using the water. My sport lends itself to that type of learning [experiential/experimental] because of that.” (Rhyse, Canoe/Kayak)

Contrastingly, Ray's comments more closely align with Ericsson, Krampe and Tesch-Römer's (1993) 10,000 hour, or deliberate practice rule, which could be considered the antithesis to deliberate play. Ultimately however, these experiences collectively highlight that a varied sports history and children’s self-directed practice can be valuable assets in Olympians’ and elite athletes development.

6.2.3.2 Personal characteristics contributing to athletic success

In reflecting upon character traits that were most attributable to their positive development and subsequent athletic success, Olympians’ and their entourage described several characteristics using a range of powerful terms. In summary key traits included: adaptable, ability to compartmentalise emotions, committed, competitive, coachable, conforming, eager to please, focused, independent, mental toughness, [possessing] natural talent, optimistic, organisation and time management skills, perfectionist, self-motivated, strong work ethic and willingness to try new things. For some Olympians’, personal characteristics were not just one component of their athletic success, but a decisive factor.

“I feel I was lucky in terms of race day head. I had a reasonable ability to turn it on- I didn’t really care what happened before the start line. I think you’d have the world’s worst week, or you’d just flown in from Australia, or the cat just died, or whatever. I didn’t really care. As soon as you’re on that start line, you just had to clear all that out.” (Rhyse, Canoe/Kayak)

“I am so dead set that in my case it was innate...I'm not saying that I was born with it, but my innateness means in my situation, in my environment, I made the [determined] decision not because I had a nice facility, not because the sun came up in one direction...I was so serious that it wasn't funny. To the extent that I'd visualize the word "Australia" across my back.” (Sonya, Hockey)
“I think that I was pretty resilient in this sense that I could have a knock back -- I might be in tears and whatever, but I could go out and just get on with the next race without it affecting my performance.” (Andrea, Canoe/Kayak)

These comments indicate that personal traits can be considered of equal or greater importance to talent, technical skill or other environmental factors (Dweck, 2006) in the attainment of athletic success. Resilience and similar traits including perseverance, grit, drive and determination were however, most commonly described, or overlapped with several aforementioned traits. These terms were used to describe the hard work involved in becoming an elite athlete, not just from a training perspective, but also in overcoming setbacks, injury and disappointment alongside the need to make sacrifices in other areas of life.

“I just pushed and pushed and pushed until I got there…I know a lot of people who are far more brilliantly skilful than me, but didn't have that driving them, and I think it's hard to make it at the top level, no matter how skilful you are, if you don't have that drive and hard work and the mental side of it.” (Felicity, Hockey)

“I think a passion for the sport as well… that helps on those days where you feel horrible, you really don't want to go to gym training…that's when the perseverance just doesn't work at all, but it's those days that make all the difference.” (Lucy, Gymnastics)

“Someone who endures…is resilient…has a good work ethic…if you have talent, the work ethic, the desire, the self-motivation and the grit, that's a deadly combination, you will achieve. (Loretta, elite athletics coach)

These insights are perhaps unsurprising, given great performers are likely to share comparable thinking, attitudes and attributes (Rotella, 2015), with a few of these traits also found in other studies (Bloom, 1985; Gulbin et al., 2010). Furthermore, they share similarity with the concepts of Dweck’s (2006) ‘growth mindset’ and Duckworth’s (2016) ‘grit’. Beyond being advantageous for athletic success, these traits also uphold ideals of Olympism. Athletes characterised by resilience, robustness, perseverance and striving for excellence ultimately support Coubertin’s ideologies of Olympism (Bergeron et al., 2015; McNamee & Morgan, 2015).
6.2.4 Microsystem

Most proximal to Olympians in the external environment, *microsystem* factors in the entourage encompassing family, coaches, teachers and peers, can play a fundamental role in an athlete’s career (International Olympic Committee, 2015a).

6.2.4.1 Family

6.2.4.1.1 Family ‘type’

Family were considered to play a significant and influential role in athletic development. Overall, it did not appear that Olympians’ came from a particular family ‘type’, despite some shared similarities. Several of the interviewed athletes were known to have come from families where a general competence in sports prevailed up to a national-level; however, few had other elite athletes within their immediate family. Discussed in general terms due to the nature of the study, few Olympians’ attributed their athletic prowess to genetics, regardless of family ability.

Olympians’ such as Jenny, Sonya and Troy respectively described themselves as a “*genetic throwback*”, possessing more of the “*athletic gene*” compared to siblings, or as an “*outlier*”, whilst only one Olympian, who has a history of elite sports people in her family claimed that “…*genetics definitely helps*” (Felicity). The limited acknowledgement of genetics was somewhat unexpected when discussing family, given this factor is known to contribute to the attainment of athletic potential and elite status (Eynon et al., 2011; Guth & Roth, 2013). This may suggest however, that other family-related influences are perceived to have stronger input towards athletic development.

A greater number of key similarities occurred when considering family environment. Many Olympians were raised in strict, supportive families with a strong set of values. Universal high expectations and a ‘tough love’ approach (Bloom, 1985; Chua, 2011; Sloane, 1985) were frequently described, whereby the art of resilience was inadvertently taught when, from a young age, Olympians learned to adapt when life or sport did not go to plan.

*“My mum and dad were not quite sympathetic with me…definitely tough love, but straight down the middle…if I wasn’t performing well I wouldn’t blame it on the selection or blame it on the coach or blame it on the injury…there was not much mollycoddling going on in our family environment.”* (Sonya, Hockey)

*“I wasn’t allowed to complain at home. Mum would listen but just not suggest anything. She just listened… but dad you knew that you didn’t complain…there was no pampering”* (Monica, Gymnastics)
It was evident from this study, Olympians and their siblings were encouraged to be independent and responsible for their choices from a young age. Several Olympians had part-time jobs as teenagers, regardless of training commitments or family SES. Self-motivation and commitment to their sport was required in order to receive ongoing familial support.

“We had a rule in our house. If Mum and Dad had to wake me up, they weren’t taking me, but if I wake them up, they’d take me every morning…the responsibility was on me but they provided the vehicle to get to training.” (Troy, Swimming)

Such findings support prior research knowledge that a balance of authoritative and autonomy-supporting parenting styles are most beneficial to athlete development (Csikszentmihalyi et al., 1993; Fraser-Thomas et al., 2013). From these experiences, parents often served as Olympians’ first role models and inspired a sense of ambition, work ethic and productive use of time, which was always present within the household.

“I’ve always been that kind of person “If you want it you go get it.” People are not just going to give it to you, you have to go get it sort of thing. I think that was influenced from my mum.” (Lara, Gymnastics)

“… there was always an expectation in the house that you’d work hard and do your best…there was that work ethic in the house…that sense of ambition…an expectation that you’ll achieve something.” (Monica, Gymnastics)

“…we just encouraged our children to do the best they could. I think we taught them no matter what you were doing to always do the best you can, whether it's hockey or anything else.” (Colin, club committee member and parent of Olympian)

Similar findings have been determined among high achievers and elite athletes in other research, which may suggest that the provision of such experiences within the family environment can provide developing athletes opportunity to learn important lessons about effort and persistence (Bloom, 1985; Fraser-Thomas et al., 2013; Oakley, 2014). Unlike other studies however, there was no indication that one parent (mother or father) had greater influence on athletic development than the other (Weissensteiner et al., 2009).

Despite these high expectations, there was no strong evidence of Olympians’ or elite athletes from the “hotspot” coming from families who placed strong focus on, or pressure towards, their elite athletic development. The sensitive nature of this theme potentially made it difficult to investigate. More frequently, parents had a greater likelihood of expressing concern over the lack of life balance that may have arisen from a strong commitment to sport
at a young age. Usually, it was the athlete’s themselves who possessed a greater motivation to excel in this domain, with some recognising this was likely to enhance the longevity of their careers compared to peers who may have had pushy parents.

“I think I always did feel quite independent and autonomous. It was always my decision and I do know that there were other kids along the way who did have a lot more parental pressure and they didn’t necessarily continue on to the end. I think he [Dad] just thought it was a lot of time to be spending doing one thing and he was just a worrier. He was always worried that I’d hurt myself or that I’d narrow my [life] choices.” (Monica, Gymnastics)

“They never coached and they always stayed out of it, they were good like that, they never actually pushed me. I never realized though, when I stopped gymnastics [prior to athletics] my parents were kind of relieved but I never felt that when I was a gymnast. They always supported me and then when I stopped Dad in particular said, “I just didn’t like that you were training 30 hours a week at your age.” (David, Athletics)

“There was no one sort of elite [in my family], because I do know a lot of other athletes have come from families whose parents were Olympians and elite sports people but I don’t think my parents necessarily wanted me to go down that path.” (Lara, Gymnastics)

“…as a parent that doesn’t really care about elite, I wasn’t strict but I was just prepared to say no [to taking on too much sport]…we have just made it that it is something social and he’s the one who’s pushed himself…done the hard yards…done the training…got his license on the first day so he could drive everywhere. He’s completely self-driven.” (Karen, parent of senior elite athlete)

It is perhaps unsurprising that athletic success in each of the above cases was not associated with pushy parenting, given youth sport dropouts, by contrast, are more likely to have experienced parental pressure during early development (Fraser-Thomas et al., 2008). Rather, many parents emphasised the importance of life balance and education, similar to successful athletes in other studies (Bloom, 1985; Lauer et al., 2010). Although not discussed to the extent of parental-related factors, some Olympians’ and community participants considered that siblings could have a positive influence on athlete development, particularly for those youngest within a family.
“I think for me as well, being the youngest child of a family that’s so keen on hockey, I just grew up knowing so much about it and always mucking around in the background and playing and so I think that had a big part of it as well…always watching them [older brothers] play and they were playing at a better level than me…I think that helped a lot for me.”
(Felicity, Hockey)

“I kept trying to beat my oldest brother and I think that’s what pushed me to keep going.”
(Megan, junior elite athlete)

“Tyrone [Olympian at Paul’s club] was the second sibling [youngest] and there’s an interesting study that the second sibling tends to be better than the first…he had the benefit of watching his [older] brother play.” (Paul, club committee member)

“…they're [daughters] on the same team. That sort of ignited her [youngest daughter’s] excitement to get in [to the representative team].” (Gina, parent of junior and senior elite athletes)

Aligning with current research, this sibling influence may have had an advantageous influence on some Olympians’ and elite athletes from the “hotspot”. This is due to older siblings often being viewed as role models for younger siblings (Côté, 1999; Weissensteiner et al., 2009) alongside providing motivation to be involved in sport, competition and building mental toughness through providing the challenge of keeping up with someone older and stronger (Davis & Meyer, 2008; Hodge et al., 2012).

6.2.4.1.2 Family resources (Mental-emotional, financial and logistical)

Families of Olympians’ and elite athletes within the “hotspot” made sacrifices and provided a plethora of resources and support in order to assist in their child-athlete’s career development. Resources of a mental-emotional nature were considered the most influential that a family could provide, as it was often manifested in multiple ways through family sacrifice, unconditional support, presence at sporting competitions, providing honest feedback alongside willingness to provide financial and logistical resources into adulthood. These resources were demonstrated by providing opportunities for athlete’s to fulfil their potential and was considered key to attainment of sporting career objectives.

“…they were as committed to get me there as I was committed without being emotionally pushy about it…it's just simply, that's what she wants to do, and we'll back her 100%.”
(Sonya, Hockey)
“I think it’s that encouragement and support that you’re doing this…I think back to when I’m a kid and my mum comes down to school to watch [and I’m like] “Oh Mum, what are you doing here?”…but I think once I got a little bit older, I really valued the fact that they were interested in what I was doing and they were there supporting…they played a massive role in what I was doing. I was really glad that they could come and watch the end result of all that [at the Olympics] because that was what it was all about…so that certainly played a big role” (Jenny, Athletics)

“It’s very costly, not just with money, but time as well…as a young girl you don’t fully understand the commitment that’s involved on their behalf. Your life is very simple. You don’t see the bills…the food prep, you don’t see any of that.” (Lara, Gymnastics)

Coaches and parents of elite athletes were able to provide their own views, which supported many of the athletes’ perceptions regarding the key role family resources played within positive athlete development.

“…I think you definitely need your family support, you need it from the beginning…also honesty with them…they would come home and say “I had a terrible game” and I would go “It wasn't that bad, but not your best", being honest without being brutal…we tend not to sugar coat it for them.” (Gina, parent of junior and senior elite athletes)

“I think the parents that did it well were the ones that help ground their kids when they didn’t perform well, so help give them a reality check, help keep things in perspective, help them be resilient and resourceful in the way they approach it, help them set realistic and achievable goals at the same time.” (Jacqui, elite swimming coach)

“Emotionally stable, a relatively emotionally stable family…not overreacting to results and letting them know you still love them even though they didn’t get what they wanted out of the last experience…I think that is a big key…I think most of those [elite and Olympic “hotspot”] athletes have got that.” (Roger, elite rowing coach)

These outcomes amongst the Olympians’ were perhaps unsurprising, given the development of expertise in sport and fulfilment of potential is most likely to arise from a supportive socio-developmental background (Csikszentmihalyi et al., 1993; Weissensteiner et al., 2009). Several studies have found effective parenting in sport is characterised by the facilitation of social and personal development opportunities for their child-athlete (Bloom, 1985; Côté, 1999; Csikszentmihalyi et al., 1993; Fraser-Thomas et al., 2013; Hodge et al., 2012; Oakley, 2014; Saelens & Kerr, 2008).
Often these familial resources overlapped with the sacrifice of time, money, effort and re-arrangement of schedules, which aligns with prior research on athlete development (Bloom, 1985; Côté, 1999; Fraser-Thomas et al., 2013). Beyond mental-emotional resources, financial sacrifice was key within all families, especially at the grassroots level. A family’s willingness or ability to fund their child-athlete’s career was considered vital to their early development due to the necessity of reliable transport, equipment alongside payment for registration and competition fees at both club and representative levels. Parents often travelled great distances, including overseas, to watch competitions, even at the senior level. Some Olympians’ acknowledged they could not have progressed along elite sporting pathways, or remained in amateur sport for an extended timeframe, had it not been for family socioeconomic status (SES).

“My parents were very supportive - they travelled the world watching me compete…I was really lucky in that regard that I certainly had a very supportive environment in terms of competing and achieving what I wanted to.” (Jenny, Athletics)

“They had to pay for a lot of things…and you hate to say it, it’s not that my parents are rich but they’re comfortable, they’re middle class…so I never went without anything. They’d pay for me to go anywhere, they’d cover my costs for everything …so it’s another thing that matters, having the means to be able to do it all…[in early adulthood] I was making dribs and drabs [of income through sponsorship], but I wasn’t able to work…I was studying part-time but my parents were helping me out and I was 25)” (David, Athletics)

“…when you’re accepted [into WAIS programs prior to scholarship level] as a little girl there’s high fees involved. It’s very costly…which again could lead to why it's the Western Suburbs [the “hotspot”].” (Lara, Gymnastics)

“As a junior when we were counting it costs $AUD20, 000 [annually] just for Jodie and Emily…we sacrifice a lot financially wise but I love it, I love watching them, I’ve followed them around as much as I can.” (Gina, parent of junior and senior elite athletes)

Some coaches also believed that access to quality, nutritious food was an indirect financial resource provided by parents and could be directly linked to the high SES of the “hotspot”.

“I think they could probably afford to provide the kids with a healthy diet…I’m sure they’re conscious of those things…and I think the affluent areas will always have fruit and veg and they will always have all those good foods. You would probably find that most of the parents [of “hotspot” Olympians] were well-educated people.” (Greg, elite swimming coach)
Family financial resources are known to be significant to athlete development, with correlations existing between parental SES and the skill level attained by their child-athlete (Khalil et al., 2014). High achievers in general, are known to arise from middle-upper SES backgrounds, due to greater availability of resources (Gladwell, 2008) and the opportunities afforded to children to sustain effort until success is achieved (Dweck, 2006).

Furthermore, logistical resources through the provision of transport and being the ‘taxi driver’ were a valued and common parental support. This demonstrated parental dependability even into adulthood and demonstrated the way in which various parental support systems could sometimes overlap.

“My mum was 100% dedicated to making sure that I got what I needed. I know it sounds really basic but not once did she ever not take me to training on time… she was very, very reliable. She’d be every day, on time, doing the taxi driving thing…every time she picked me up she’d have a snack in a little lunchbox, a change of clothes or clean school uniform.” (Monica, Gymnastics)

“We were on the 5 o’clock [am] flight out…and at midnight Dad is like “I’ll pick you up at 4 o’clock.” I said, “Dad, I haven’t even packed yet. I don’t think I’m going to be able to go.”… and he’s going “No, you’ll be all right. You can do this. I’ll see you in the morning.” So there was the emotional support but there was also the fact that he’s getting up at 4am to take me to the airport. I really did know other people who had to try and get themselves to the airport…and of course when you’re training you’ve got no money to pay for a taxi…all the really practical things, they were really supportive.” (Andrea, Canoe/Kayak)

Finally, several parents of Olympians’ and elite athletes were characterised by their willingness to be involved with their child-athlete’s sport as volunteers. Coaching, officiating, fundraising and serving on club committees were unpaid roles often undertaken and align with tangible resources known to be present within athletic families (Bloom, 1985; Côté, 1999; Fraser-Thomas et al., 2008; Fraser-Thomas et al., 2013). Coaching or judging by parents were however, potential sources of stress for young athletes and so were kept to a minimum. Indirectly, this demonstrated interest and investment within an athlete’s sporting endeavours and a way to give back to the clubs or sporting community that had assisted their children.

“… they always helped there, they always volunteered…they’d help out when the fundraising was on, they’d help out time keeping at the end of the lane. They made a big effort to be at just about all my swimming meets” (Troy, Swimming)
“They were always involved…they would sell raffle tickets and fund raising…they were never coaches or anything, they were very close with everyone, they were always there, every comp and stuff like that and they were involved” (David, Athletics)

“My dad became very involved in terms of officiating and he certainly felt a responsibility to contribute to the sport because it was volunteer based and his daughter was competing so he did his bit…even after I retired from the sport, he still contributed to it and still does to this day.” (Jenny, Athletics)

“Dad’s been a coach for many years, he’s also been the Vice-President…he’s a life member…he’s always been supportive.” (Alex, senior elite athlete)

“Certainly if I looked around at our top level teams, most of the guys and girls parents would be involved currently or have been involved previously in some form. So if they are able to coach, they would’ve coached, some may have managed or done administrative roles.” (Phil, club committee member)

Taking on these roles appeared to be well received by the Olympians’ and may have had a positive influence on their initial engagement and retention within youth sport, eventually leading to elite pathways. The Department of Sport and Recreation WA (2015) support this idea and state parental volunteering at the grassroots level is considered key to retaining young athletes in organised sport. Ultimately, the link between Olympians’ and parental volunteering within the “hotspot”, may suggest the conduciveness of this practice for successful athlete development.

6.2.4.2 Training environment and community sports clubs

Beyond family influence, training environments and community sports clubs can also significantly influence developing athletes from grassroots to Olympic level. For most Olympians, their initial organised sports experiences were with community clubs except for gymnasts, who often spent minimal time in this way, due to early specialisation and entering the Western Australian Institute of Sport (WAIS) programs at early primary school age.

6.2.4.2.1 Club culture and spirit

Many members of the “hotspot” sporting community expressed pride when discussing the culture and spirit of their clubs, with several Olympians’ discussing how their initial sporting experiences had a significant influence on the interest they developed in their sport. A positive culture was considered a vital aspect pertaining to the sustainable success of any community club and its athletes, especially when underpinned by strong organisation, stability and a welcoming environment which catered to social and competitive athletes of all
ages. Several athletes recalled being members of organised, functional clubs, with minimal politics amongst parents, coaches, athletes, officials and club committee members. Friendly, fun and family-based clubs were also highly rated, as they made the club environment attractive, whilst retaining athletes long enough to continue their development within the sport.

“Organised, functional, no emotion…clubs that are calm and have it together, that is clubs that are run by unemotional people. It’s the calm and have it together that will produce. As a young athlete or a young sports person, you feel it’s easy. You don’t feel stressed by that parent having an argument with that parent or abusing the umpire or whatever—it has to be stable.” (Sonya, Hockey)

“…you go down there and you just feel immediately supported when you walk around the club…you just have this network of people where everyone knows everyone, it’s just a really nice feeling. I think that level of support; you can’t underestimate it, because you get a lot of energy and positiveness out of it. And that really helped with my career and going forward…there’s a lot of people there who had a lot of time and knowledge for me when I was playing, and that definitely helped.” (Felicity, Hockey)

“When I said, yes, I’ll learn to paddle a surf ski, guys would go on a double with me, so they were really accommodating like that. It [surf lifesaving] was very misogynistic you used to hear all the time “if you can’t carry it, don’t paddle it” …but the guys at [Andrea’s club] would help you, whereas at other clubs they wouldn’t.” (Andrea, Canoe/Kayak)

“It was a small club, it was a bit more of family club. The parents were the ones running the show but it was a nice, little club. There were some kids from school that had joined that club too, so I knew kids there…so we had a lot of fun. Training was not boring.” (Jenny, Athletics)

“The [surf club] has got a great community atmosphere down there. There’s a lot to be said about people feeling belonging to a community of which the values are sort of central but everyone can be different as well.” (Troy, Swimming)

Not only was it the Olympians’ who perceived “hotspot” community clubs that were stable, welcoming and engaging, but also junior elite athletes and parents. Some of these individuals travelled from outside the “hotspot” to become involved in community clubs, due to the reputation of their strong culture.
“I might be biased but I think [hockey club] is pretty unique with the way we run the juniors and the culture of the club. It’s a very social and friendly and people enjoy being there. It’s a fun place to be…there’s a lot of things that ticks a lot of boxes for people…it’s interesting and stimulating…people want to be there.” (Colin, club committee member and parent of Olympian)

“I decided I had to go where I was going to improve and then that's when I went to [“hotspot” club]. Everyone's friendly…it's known as one of the top athlete clubs in all of WA. I moved from [non-“hotspot” club] when it got really bitchy…but [“hotspot” club] everyone’s really welcoming” (Megan, junior elite athlete)

“I was scared when I first heard about [“hotspot” club]...but I got there and I was accepted quicker than I was in [non-“hotspot” club]...I was terrified that I wouldn't fit in. But it was the opposite – even though you were new they would talk to you. At [non-“hotspot” club] if you were new they would be like 'Go away, I don't want to speak to you'.” (Angela, junior elite athlete)

“[in response to daughter Angela’s previous comment] They don't just do that to the players, they do it to the families - they welcome you and try to include you in their social group.” (Sue, parent of junior elite athlete)

Several of these positive community club characteristics within the “hotspot” align with those found in Toohey et al’s (2015) Australian study on high-performing cricket and Australian football regions and their clubs. Evidently, the social dimensions of community clubs cannot be underestimated, as they provide opportunities for young athletes to have meaningful and enjoyable experiences (Light et al., 2013). In turn, this can be highly influential in attracting youth to a sport and retaining athletes (Agnew, Pill, & Drummond, 2016; Thedin Jakobsson, 2014).

Some members of the community considered that clubs were partly able to provide this advantageous environment to developing athletes due to the established nature of the “hotspot”. This was considered advantageous compared to newer areas and clubs in Perth which may not have had time to create strong social infrastructure. Some “hotspot” clubs had members who had been living within the “hotspot” long-term, or had extended involvement with the local sporting community. This was perceived to result in a sense of “everybody knowing everyone else” through neighbourhood, sports club, private school and university connections. Accordingly, a strong sense of loyalty and attachment to clubs was demonstrated through phrases such as “family”, “a new church”, “home” and “a place where people want to be” being used to describe them. Such factors were considered to have led
to stronger investment in clubs, through a sense of community spirit and traditionally high rates of volunteering. Subsequently, this enabled community clubs to build in size and strength, which in turn, enabled continuation of the supportive club culture considered integral to positive athletic development.

“Maintaining continuity in your club culture can have a big influence on the strength of your club. A new club can’t suddenly create a culture that is...robust because it’s been around for 20 years. They need to take their time to do that, but I think it is an important feature for the success of the clubs in the Western Suburbs.” (Phil, club committee member)

“Even the ones who are working are willing to put their time back into the community. They’re the ones who have probably come through the clubs and lived in the area for a while so they see the benefits of putting back into it...if the ["hotspot"] has that higher ratio [of Olympians] then I think that can be attributed a lot to that sense of belonging to the community, so they are willing to stay and support the clubs or the community in itself.” (Joe, community development officer)

“We’ve got a phenomenal number of volunteers [in the “hotspot” generally]... we’re 2 or 3 times the state average” (Mayor A)

“I remember when our kids were young, people were sticking their hands up left and right...we were competing to take turns [at volunteering], you know!” (Bill, club committee member)

Similar findings of high volunteering rates in community clubs have not only been found in other studies investigating close-knit communities (Balish et al., 2016), but also triangulate Study 1 descriptive demographic data that show the “hotspot” volunteering rate was high compared to Australia overall (26.1% versus 17.8% respectively). Such community features are typical of the social capital often built within Australian sports clubs, which are known agents for local communities to build unity, trust, loyalty and pride (Stoddart, 1988; Townsend et al., 2002).

This sense of belonging is becoming ever more important and rare, in an increasingly secular Australia, with sports clubs having become a replacement for church groups as an avenue for developing community ties (Spaaij, 2011). Evidently, the beneficial features of club culture within the “hotspot” had potential to positively influence athlete development. Ultimately, this is unsurprising given that clubs demonstrating strong, positive, cohesive cultures with a sense of enjoyment, are most predictive of successful junior athlete development (Larsen et al., 2013; Toohey et al., 2015).
6.2.4.2.2 Coaches and coaching style

Quality coaching appeared to be prevalent across many community clubs within the “hotspot” and was considered to be interrelated to club culture, especially at the junior grassroots (community) level. As with club culture, quality, fun and positive experiences with early coaches were considered important factors in attracting young athletes and retaining talent within a sport. Coaches who instilled a passion and motivation for the sport, were kind, encouraging, welcoming, focused on skill development over winning, set achievable challenges and created a fun environment, were recalled most fondly and considered integral to positive athlete development, especially at the grassroots level. Junior coaches were often volunteer parent coaches or senior athletes including some who had been elite athletes or Olympians. Some clubs even gave their juniors the best coaches, due to the belief that taking care of their youngest athletes was vital.

“Honestly, I didn’t want to leave [to go to WAIS] - I loved my coach there and loved the environment there…she was a very kind coach, she made everything fun, which made me fall in love with the sport and made me want to sort of challenge myself and try to improve and get better and better. Every session I would go and look forward to being with her because I knew she would give a lot of positive feedback…so I knew if I was going to the gym, I was going to feel good. [Then with my next coach] he loved bars as well, which for me that was my passion so every time I would go to bars it was sort of his playground as well and so I would try a little harder on that event which, over the years turns out I got a bit better at bars than the rest.” (Lara, Gymnastics)

“…if you’re serious about coaching you’ve got to make it about fun…an environment where athletes have fun and they get challenged then they learn more and they want to come back again.” (Ray, Hockey)

“I think [junior coaches] were a massive influence [in athlete development], because every year’s so important in your development and you really do change a lot as a sportsperson every year. Growing up I pretty much always had a parent [coach], we had probably five parents that we’d rotate, every year we’d change. I think there was a big focus on basic skills and positioning and teamwork, and I think that sort of stayed with me growing up.” (Felicity, Hockey)

“…from my point of view, it is better to enjoy it [training] even when it’s up to Olympic level. If you’re not enjoying it then what’s the point?” (Robert, elite hockey coach)
In the area all these kids play for a club that has ex-State players, ex-Olympians who actually coach the juniors. We always thought that our junior coaches should be our best coaches” (Bill, club committee member)

Several of these identified characteristics have been highlighted by the International Olympic Committee (2016) as being present in effective coaches. These traits are especially important for youth coaches who play a critical role in children’s early sports experiences and skill development (Gulbin et al., 2010; Horn, 2008; Martin, 2014). Furthermore, they reinforce knowledge that positive early sporting experiences arising from fun and challenging activities, is most likely to enhance outcomes for participation and performance (Bergeron et al., 2015), as evidenced by the “hotspot”.

As Olympians’ matured and progressed through their careers, a coaching style which maintained a healthy balance of respect, independence and strict guidance was considered most effective. This enabled a successful partnership to develop through a trusting coach-athlete relationship, which in some cases, required renegotiation when adult athlete’s had been with their coach since childhood. Similar to their relationships with parents, coaches who challenged athlete’s and maintained high expectations whilst remaining unconditionally supportive, enabled athletes to experience greater self-belief about what they were capable of achieving.

“[He was] very strong, a very good coach and he’s gone on to have success in other places as well so I was lucky to have a really good coach initially… but he was really strict and pushy…so I started losing motivation completely because he was treating me like a kid and I’m an adult. I think he got me a long way…my initial [high performance] coach saw something in me [potential] and worked really hard with it.” (David, Athletics)

“She always has an abstract way of thinking about things…she won’t go like the straight and narrow, you have to do this or you have to do that. She’ll make sure that you get your program done, but at the same time if something’s obviously not working, she’ll either just focus in on that or just be like “leave it today, it’s not working”. She can definitely be fair when she needs to and lax when she needs to. If she’s getting frustrated she’ll say “You stay here, you do it,” and then walk away, yet obviously keep an eye on you. I think because I’ve been with her for so long, that trust has definitely built over time. It obviously wasn’t there when I was 11-12, [but now] I go into the gym, I do my program, check if there’s anything else I need to do and then I leave.” (Lucy, Gymnastics)
“He was amazingly supportive. It really was to the exclusion of other athletes. He had gone ‘These are the ones that I think can make it. These are the ones that I think can’t.’…maybe that’s what all really good coaches do…but he was very focused on whatever Andrea needs she gets…he was always in my court but he would never let you get away with things that he knew you shouldn’t get away with” (Andrea, Canoe/Kayak)

“They held you accountable. They commanded respect and for some reason you saw them as a fatherly figure…I've had a family who has strong values and I couldn’t ask for any more…but [coach] was the same type of person but from a different background.” (Troy, Swimming)

“Lisa was very goal driven, very purposeful, a very serious character- she’s one of the most important people in my life. She had very high ambitions for us and it was a huge change. There was no slacking off I can tell you…I think it was really significant but at the time I don’t think I ever realized it. Lisa had the vision and the belief and I kind of had the drive to do my best and together I think it worked well…there’s something about Lisa and something about me that just fit.” (Monica, Gymnastics)

As identified by the “hotspot” Olympians’, negotiating and balancing a healthy coach-athlete relationship was vital to their ongoing development and sporting experiences. This is supported by research, which suggests coaches have a core influence on athlete skill development, satisfaction, motivation and performance (Connaughton et al., 2010; International Olympic Committee, 2016) as a consequence of their behaviours and interactions with others (Erickson & Gilbert, 2013). Furthermore, the types of coach qualities and assistance athletes required as they progressed through elite sport, evolved from their grassroots experiences. These findings are not unlike Gulbin et al. (2010), who determined the coach traits required by athletes change throughout development whereby technical qualities such as a detailed knowledge of the sport and insistence on perfection, become the most valued coach qualities at the elite level.

Finally, strong local competition between clubs was a sport-specific reason quality coaching was focused upon. Swimming provides an example of a sport within the “hotspot” which had multiple clubs in close proximity to one another. Not only were athletes competitive amongst one another but coaches also, which led to high standards continually being raised. Swimming was in an interesting position, where three clubs, each with elite level coaches and athletes, trained at the same facility alongside each other. The varying strategies used by the different coaches, was a requisite key point of difference for clubs and coaches to retain and develop their athletes.
“...the pressure to perform as a coach was really high because the athletes could mutually see what was going on. You constantly had coaches or athletes walking past the board, so when you’re running your programs anyone could see...so then it had to come down to quality coaching.” (Jacqui, elite swimming coach)

Given that Jacqui’s reflections coincide with the era in which the “hotspot” had the highest number of Olympic swimming representations, this unusual occurrence may have been a strong contributor to athlete development in swimming and subsequently resulted in this sport being the leader for “hotspot” Olympic representations, as evidenced by Study 1.

6.2.4.2.3 Mentors and role models

Beyond quality coaching, ease of access to visible mentors and role models was considered to be another advantageous and prevalent feature within “hotspot” community clubs. The tradition of strong local competition and clubs in the “hotspot” resulted in several elite and international-standard athletes developed in the area, which was viewed as exciting and aspirational to emerging athletes.

“There were role models everywhere...I grew up playing next to people who had played for Australia and who had been overseas and played at the Olympics...John Winter, was the bank teller and he was the gold medallist in the high jump at the London Olympics in '48...and Herb Elliott was a local...like the Olympics were fantastic, but people from here were winning.” (Ray, Hockey)

Although being aware of local role models and successful athletes was considered inspiring, having direct interaction with at least one mentor or role model on a regular basis was considered most influential. These individuals were considered valuable role models not only for their achievements, but also due to their willingness to interact with and mentor younger generations of athletes. While some were involved in formal coaching roles, often many volunteered their time to provide skills sessions, give advice to younger athletes at training or attend junior end-of-season presentations. In a supportive environment, informal coach-mentor like relationships amongst athletic peers can have the potential to enhance performance (Phillips et al., 2010a).

“I remember watching girls in the group above me and I was like, “Oh my God, I’ll never be able to do that, that was amazing”. I think that if you didn’t have that influence in the gym, then it would be a lot harder, because you wouldn’t know what you’re capable of.” (Lucy, Gymnastics)
“… when [“hotspot” Olympians] won at the Sydney Olympics in 2000, there were massive posters tall as the roof for both of them as you walked into Challenge Stadium [training location for swim clubs], so it was a really inspirational…so I definitely do think there is an advantage to swim in a lane next to them or to have these guys run camps for younger kids.” (Jacqui, elite swimming coach)

“…they [juniors] can actually go down [to the club] and our club has [Australian Olympian] playing and he's been the best player for the last 15 years…so kids can come down on a Saturday and watch him play in [club] colours and get his autograph. And that's a really big deal for a kid.” (Alex, senior elite athlete)

Such occurrences were considered to have the potential for “success to breed success” (David), as they enabled sporting success to be normalised through having these role models as regular members of their broader Perth sporting community.

“Probably not so much at a club level, but at an association level there was plenty of women around that were competing at a reasonably high level. As a junior athlete you come down and you can watch those elite athletes compete every single week. It’s just normal…I didn’t know anything different. Shirley De La Hunty [Strickland] was also there…she was a coach. I didn’t really realize how big she was because that was just Shirley, she was just one of the locals. It was not until I was much older that I realized how great she’d actually been and how much she’d actually paved the way in terms of women in athletics in Australia.” (Jenny, Athletics)

On the whole, Olympians’ and the community believed proximal role models to be most influential and played a role in normalising success. Similar outcomes have either been hypothesised or determined in other athlete development studies involving communities with relatively small populations (Balish & Côté, 2014; Henriksen, Stambulova, & Roessler, 2010a; Henriksen et al., 2010b; MacDonald, Cheung, et al., 2009). The positive outcomes associated with these influences may potentially correlate with the divisive concept of ‘psychological momentum’ and its potential for performance-enhancing outcomes (Iso-Ahola & Dotson, 2014), which may have had broader influence within “hotspot” training environments and community clubs. Based on these positive experiences, Olympians’ relished the opportunity to be role models to the next generation. They considered it to be an important duty to pass on knowledge and continue the cycle of excellence, which, due to its occurrence in multiple sports, may have had an ingrained influence in the “hotspot’s” success.
“I know when I was in the juniors, I’d have the 1’s [top club grade] players or Aussie players coming down to training or coming down to present awards…and it just really helped…there was such a buzz about when that happened, so I try to give back in that way” (Felicity, Hockey)

“I came back [from the Olympics] and some of the kids saw how hard I trained, what the yardstick was and the whole group had to live to that yardstick…I think it was an important part of my career [becoming a role model] because it allowed me a challenge especially after achieving your pinnacle.” (Troy, Swimming)

6.2.4.2.4 Opportunity to train and compete against older athletes or in a co-ed environment

Olympians’ and community stakeholders recognised cases from their own developmental experiences or sports clubs where opportunities had existed for youth athletes to train and compete against older athletes. Several Olympians were able to recall these experiences from as young as their early teenage years, with some females having opportunities to train or compete against their male counterparts. Mainly, this occurred informally, progressively and at developmentally appropriate stages for the individual athlete such as when their club, coach or training environment provided these opportunities.

“…we didn’t compete in age groups, we competed in ability. So by the time I was about 16, I would have been competing mainly against the senior women. It meant that I had the opportunity to always be pushed, I wasn't just running against girls my own age all the time and winning all the time...then as an adult, I often competed against the men, so that philosophy was always there.” (Jenny, Athletics)

“So I played boys and girls growing up, although they weren't older, they obviously played and feel a bit tougher, so that was good. Now what we tend to do is every pre-season, we invite down the top ten players from under-seventeens, under-fifteens, and maybe a couple of thirteens if they're really good. And those players join us for our whole pre-season…that happens every year, and it just gives them a taste of what senior hockey is like…I think it helps them and gives them a taste of what it's like to play at that level as well, and what kind of fitness we do, and they play games with us, so that's really good for their development too.” (Felicity, Hockey)

“I did that [trained or competed against older athletes] a lot and you get invited down to play…I just think it's an appropriate extension of training, it's helpful for their [developing athletes] improvement…so you get stretched…and you learn more quickly, you get cut out.” (Ray, Hockey)
“…but in swimming the other thing is, it’s not just the age it is also the cross-gender, the girls can train as hard if not harder than the boys, which to me is a huge advantage for the girls…it can be a way for the girls to exceed their female expectations, they’re actually competing with the males, trying to be better than the males and so they’re lifted to another level so to speak.” (Brian, elite swimming coach)

“I had an ex-Jillaroo [Australian junior women’s hockey team] helping me when I was in the goals with her…every time I was in goals I’d have someone behind me always telling me ‘Fix your lunges up, hands up’ and just giving you key reminders…and they [the seniors] would come to juniors training so the players could progress.” (Angela, junior elite athlete)

Such practices support holistic athlete development frameworks by recognising the non-linear nature of athlete development and adhering to ‘best practice’ for an athlete’s developmental phase, rather than following age-related prescriptions (Côté & Erickson, 2016; Gulbin & Weissensteiner, 2013). Such opportunities can also be considered advantageous due to the informal mentor-style relationships they can provide with older peers, which can have the potential to enhance performance (Phillips, Davids, Renshaw, & Portus, 2010b) through physical and mental skill development.

Not only were such practices considered to challenge developing athletes to extend beyond their current skill-range, they were believed to assist with the junior-senior competition transition, which could otherwise heighten drop-out rates among ill-prepared youth athletes.

“If they’re getting familiar with the way the senior side of the club works at that age, it’s much more likely that they’ll succeed in the senior group. If they came in cold because they’d just finished school hockey, they probably would struggle to fit in.” (Phil, club committee member)

Overall, it is evident various sports-specific communities within the “hotspot” recognised the value of opportunities to train and compete alongside older and co-ed peers as being integral to athlete development. Whilst influential, these practices are not entirely unique and have been found advantageous in other small communities and successful athlete talent development environments (Balish & Côté, 2014; Côté et al., 2003; Côté et al., 2006; Soberlak & Côté, 2003). In turn, the outcomes of these practices are known to be conducive to expert skill learning (Côté et al., 2006) and potentially are more likely to facilitate elite development (Weissensteiner et al., 2009) and sport expertise (Côté et al., 2003). Ultimately, it is evident that such beneficial outcomes are likely to have played a role in the “hotspot’s” positive influence on Olympians’ early development.
Aside from some council support with maintenance of facilities, most community clubs at the grassroots level were largely self-sustaining in providing opportunities or financial support to promising junior or elite athletes. Club fundraising through the canteen, barbeques or other initiatives were vital, as was the sponsorship or donations received from affluent members, in some cases. Several Olympians’ and elite athletes recalled some direct financial support when making a representative team, or indirectly through abolished or waived season fees. Although covering only a small component of the total cost of becoming an elite athlete, when it was provided, financial assistance from community clubs was considered valuable in assisting athletes with opportunities to further their career development.

“They often held fundraisers in Olympic year and that sort of thing. For their elite players…if you go on a state trip, they’d give you a certain amount of money to help out with the finances…given you’re not working and it’s not a professional sport, it just really helped.” (Felicity, Hockey)

“I remember my early days in gymnastics…there was so much fundraising that went on all the time you’d have orange-picking weekends and Lamington drives and you’re always trying to sell something to raise money to go on trips and competitions.” (Monica, Gymnastics)

“It all came back to the families. There was nothing that I remember [club fundraising]. It was all the families…I was lucky that my parents were in a position to be able to help out.” (Jenny, Athletics)

“It wasn’t put out there as an incentive but when you made the [representative state] team you would get a phone call from the President saying “Well done, we’ll waive your fees for the next year.” (Alex, senior elite athlete)

Such knowledge emphasises the role of parental sacrifices and family SES in supporting the career development of elite athletes. Overall, this may further highlight the relationship between SES and sporting success, which may have inadvertently provided an advantage to developing athletes from the “hotspot”, given that the highest levels of sports participation in Australia have been found to correlate with high SES (Eime et al., 2013).
6.2.4.3 Schools

6.2.4.3.1 Early introduction to sport

Most Olympians did not perceive their school (primary and high) to directly influence athletic development in their Olympic sport. This was interesting given that many had gone to private, fee-paying high schools which have traditionally been known for their strong sporting cultures (Cashman, 2011a). Several Olympians, did however perceive experiences in primary school particularly, had promoted their general exposure to sport and physical activity (PA), which in some cases encouraged them to join clubs outside of school. Largely, a school’s overall attitudes towards sport, physical education (PE) classes and interschool competitions were decisively influential. Other retrospective studies have demonstrated it is not uncommon for athletes to be introduced to their eventual sport within the school setting, with schools being fundamental in providing opportunities for young athletes to develop fundamental movement and sport-specific skills (Hodge et al., 2012).

“[It] was a very sporty school. We used to play sport all lunchtime and there was no sitting around -- there was chasing around the school or playing on the grass. It was a very active school…we had a dedicated Phys-Ed teacher…Phys-Ed was a really big part of what we did.” (Monica, Gymnastics)

“Certainly at primary school I was exposed to sport, and a lot of it. Our headmaster was really keen on sport…and I had a couple of male teachers in later primary school who were both really keen on sport, too so there was a lot of exposure at that level…so I wanted to then join a club and do the next step.” (Jenny, Athletics)

Although Olympic rowers from the “hotspot” were unable to be interviewed, other athletes and some of the community observed that this sport was one strongly influenced by schools, rather than community clubs. Traditionally, rowing holds a strong connection to private schools, with little exposure to programs and facilities for young athletes who do not attend these institutions.

“If you go to a public [government] school that doesn’t offer rowing, you’re not going to go out and do rowing because you’ve just never been introduced to the sport, but if you go to a private school and you get introduced to that, you say, “Okay, I may as well try out for the team.”” (Lucy, Gymnastics)

“…the majority of people that row at the highest level come from a private school…all those guys [“hotspot” rowing Olympians], every one of them were all out of a private school…it’s unlike cricket, football, running, swimming [which] every kid tries from a very young age.” (Roger, elite rowing coach)
Such comments can highlight the propensity for many rowers, particularly within the “hotspot” to come from private school backgrounds. Simultaneously, this knowledge emphasises Study 1 descriptive demographic data regarding the “hotspot’s” dominance of non-government (private) school attendance during secondary school (59.7% compared to 19.1% overall reported Australian rates) and the affluent demographic of families who reside in the “hotspot”. Overall, it could be interpreted that primary schools play an important role in promoting PA, whilst some sports, such as rowing, have school-specific factors attached to them, which may have been advantageous for aspiring Olympians raised in an affluent “hotspot”.

6.2.4.3.2 Access to facilities

The positive attitudes towards sport in “hotspot” school environments were perceived to be closely linked to schools’ ease of access to quality facilities including sports halls, hockey fields, basketball courts, swimming pools and rowing sheds. Schools across all sectors (government, catholic and private) were considered to possess some facilities with the greatest abundance being present within private schools. This was often due to school wealth alongside their geographic fortune in being located proximally to natural facilities including parks, beaches and the river.

“...they [private school] sit on the river and the ocean. They've got easy access to sailing, rowing, swimming, water polo and that's why they're looking at those [Olympic] sports, because of the location.” (Greg, elite swimming coach)

This aligns with Australian research, which has found students are more likely to engage in PA in the school environment when space and equipment for sport are available (Martin, Bremner, Salmon, Rosenberg, & Giles-Corti, 2012) and may suggest this provided skill development opportunities for children attending school in the “hotspot”.

As evidenced by the Department of Education (2009) need to have a ‘Swimming pools at schools’ safety policy, this was a facility considered relatively common in Perth schools, particularly in the Western Suburbs. Alongside private schools, some primary and government schools unusually possessed pools. Although many were not Olympic-sized, they provided the opportunity for water familiarity and PA to occur. These pools were regularly used during PE lessons and at lunchtime during summer.

“We used to have swimming lessons at [primary] school all the time. On hot days they’d let us go in the pool at lunchtime.” (Monica, Gymnastics)
“I suspect the fact that because there are pools and it’s the Western Suburbs that it was funded by Parents and Citizens groups…it’s a fairly wealthy sort of environment here…it’s the only area I know that primary schools have pools.” (Sam, parent of junior elite athlete)

“A lot of [government] high schools [across Perth] have pools - Churchlands High School, Applecross High School, Melville High School, Rossymoyne High School, Carine High School, Warwick High School; generally they were being funded by the schools through P&C’s.” (Brian, elite swimming coach)

“…[there’s] the number of schools that have swimming pools in that location alone, then you’ve got a lot of swimming programs within the schools and really healthy competition there.” (Jacqui, elite swimming coach)

As shown in Study 1, more than half the Olympic sports represented within the “hotspot” area were water-based sports with swimming being the most prominent. From this, it could be interpreted that ease of access to facilities and water familiarity opportunities at a young age may partially contribute to the prevalence of “hotspot” Olympic representations within these sports.

6.2.4.3.3 School-based sports competition and coaching

The aforementioned school-based facilities were often associated with sports competition and coaching, especially within private schools which are known for their sporting cultures and prestigious competitions (Cashman, 2011a). Historically, strong school-based competition was believed to have also existed in government schools as part of a broader Perth trend; however, long-term residents believed this had deteriorated over time. Both Olympians’ and community acknowledged the strong sports culture within private schools in the “hotspot”.

“[There is] a very high concentration of private schools in the area…the private schools have very comprehensive sports programs within their schools from the beginning right through. So there might be more kids who are supported in their sporting journey longer in a private school environment than a public [government] school environment.” (Lisa, high performance sports administrator)

“…[in the “hotspot”] a lot of kids go to private schools and sport in private schools carries a far greater significance than in government schools.” (Mitchell, club committee member)

“…it’s so drilled in us in private school to do a sport, and Australia is just a sport based country, that’s what we pride ourselves on and we want to do well in it.” (Lucy, Gymnastics)
“...sport is rife in schooling systems, especially private school systems.” (Troy, Swimming)

Community stakeholders in particular, considered private schools had a strong contribution to athlete development, due to them being a “breeding ground for athletes”. This was considered advantageous for developing athletes attending these schools, because of the high quality competition and coaching they were exposed to. In part, this was due to the paid, increasingly professional role of school sports coaches, which some Olympians’ and community members specifically identified. Many of these school coaches had been Olympians or professional athletes themselves and in some cases have even coached senior teams at international competitions. Such practices particularly in all male private schools, contrasted with the traditional propensity for teachers to coach school sport.

“They [private schools] spend good money on coaches…they try to get the best and are prepared to pay for it. So I think that's a big part of it. You've got schools who are prepared to pay for great facilities and great coaches...they can afford that. In State [government] schools it's pretty much just teachers.” (Greg, elite swimming coach)

“[International coach] is the cricket coach…the swimming coach…he's a gold medallist from Sydney [2000 Olympics]. The rowing coach was an international rower…the football coach was an AFL [Australian football] giant, the guy who coaches soccer is a British soccer player…those kids are being exposed to a higher level right from the beginning…opportunities, the environment, coaching…I think that if you've got all of those things come together then it helps.” (Ray, Hockey)

“I think because the [private schools] interschool swimming is so competitive that it was such an awesome breeding ground for swimming, for athletes…schools were often trying to barter for athletes even though it wasn't legal. It was definitely part of trying to build up the school. So there was that school attraction as well.” (Jacqui, elite swimming coach)

“...the coaching [at son's private school] was community-based [volunteer teachers], but the competition was fierce” (Bill, club committee member)

Despite these perceptions, none of the 11 Olympians’ interviewed cited school-based sports competition or professionalised coaching in this environment to have played an integral role in their athletic development. Additionally, only one Olympian considered a teacher-coach to have introduced them to their eventual Olympic sport.

“I played hockey as a primary school kid at [name of primary school], but only because there was a teacher who was interested.” (Ray, Hockey)
As previously discussed, coaches outside of the school setting were considered to have much greater influence for many Olympians’ during early development with family, siblings, friends, neighbours and early introduction to sport at primary school having greater influence on instigating sports involvement. On the whole, these findings appear to contradict prior research which suggests that schools and teachers are often prime sources of talent identification and are responsible for introducing athletes to their eventual sport (Gulbin et al., 2010; Hodge et al., 2012). Based on the perceptions of the Olympians’ interviewed and the recent trend towards increasingly professionalised coaching in schools, it is unlikely school-based sports competition and coaching had a strong influence on 1984-2012 “hotspot” Olympians during their time at high school.

6.2.4.3.4 Logistical support and flexibility for elite athletes

Most Olympians had been very involved in their eventual Olympic sport during high school, with the exception of the gymnasts who had been balancing the demands of elite level sport during primary school. Although not directly influential to their athletic development, the majority of Olympians were able to recall circumstances where their school had provided logistical support. Common examples included being given allowances to arrive late and leave early, adjustments with assessment and homework deadlines or being given the opportunity to have an additional free period to rest and catch up on work. One athlete even recalled a teacher creating a sleepover in the school hall when she missed a school camp due to competition commitments, to create a sense of normality and balance.

“I got an extra period a cycle to have a study session and that sort of thing, because I had so many training commitments outside of school. I’d have maybe one period a week where I could just sleep or do my homework or anything like that…that definitely did help in terms of academic pressure.” (Felicity, Hockey)

“When we went on our [Year 7] school camp, it was the week before nationals so obviously I couldn’t go on it, so my teacher did a school sleepover with all the year sevens and we stayed in the hall the night.” (Lucy, Gymnastics)

As Hodge et al. (2012) suggest, schools that demonstrate this type of support through understanding athlete commitments and allowing time off as required, can be highly beneficial. Furthermore, they uphold the IOC’s recommendations of how educational institutions can provide an effective support role within an athlete’s entourage (International Olympic Committee, 2015b).
6.2.4.4 Peers

Peers both within and outside of the sports setting were considered another important influence in Olympians’ development. Peers are known to be key instigators of motivation and participation patterns in youth sport, especially among adolescents (Bruner et al., 2013; Côté & Fraser-Thomas, 2007; Martin, 2014). Olympians considered within-sport peers to have provided camaraderie, opportunities to learn more about their sport and assisted their athletic progression.

“I loved the other girls that I trained with. We were really quite close and there was a camaraderie, friendship and because it was so intense, with the training, I think it really brought us really quite close. Closer than other friendships I had at the time, though intense.” (Monica, Gymnastics)

This is not surprising given that many elite athletes and Olympians are likely to experience their closest friendships within sporting contexts (Barreiros et al., 2013), which can facilitate avoidance of parties and alcohol outside of sport (Henriksen et al., 2010b). School peers and friends were considered to provide a sense of balance and normality outside of elite sport for developing Olympians. On the other hand, previous studies have shown these peers were more likely to apply pressure to attend parties, sleepovers, have relationships or drink alcohol, which can otherwise be disruptive to athlete development (Fraser-Thomas et al., 2008). Some Olympians recalled the need to self-reflect and re-focus during this period to remain committed to their athletic goals.

“Primary school was fine. They all understood that I was a gymnast and going to the Olympics. High school, you have your outside gymnastics friends…it gets to a point where they start…going to parties or they’ll start drinking under-age…you have to miss out…you know what you’re training for. They just kept a mental balance so it’s not always talking about gymnastics 24/7.” (Lara, Gymnastics)

In acknowledging these differences, it was recognised that different types of friends had very different roles. Ultimately, it is evident that various individuals within an Olympians entourage have potential to deliver productive or disruptive influences to athletes throughout their development.
6.2.5 Mesosystem

According to Bronfenbrenner’s (1979b) theory, the mesosystem consists of interaction between two or more Microsystems and directly influences the developing individual. Key mesosystem interactions identified include family (parent) – training environment (coach) relationships and school – community club relationships.

6.2.5.1 Family (parent) – training environment (coach) relationship

Healthy parent-coach relationships were considered vital for positive athlete development, particularly during childhood. Some Olympians’ and community members discussed how the quality of early training environment experiences could be directly attributed to the relationships parents shared with coaches. Given the nature of this relationship had potential for both positive and negative implications, there was a general consensus healthy boundaries needed to be set to prevent parents from becoming overly involved. Undesirable encounters contributed stress and distraction to their athletic development, whereas parents retaining a healthy distance from the training environment was advantageous for development. In some cases this was challenging when athletes had specialised early or become elite at a young age, such as in gymnastics, or when parents were interested in becoming more involved.

“So parents trying to be too involved, you know – the gymnast obviously, they’ve had a bad day or a fight with the coach, they come home and are quite upset and as a parent you want to fight for your child. And mum was very like that, she was very outspoken and it had to get to a point where I just had to say, ‘Mum, you’re making it worse’ because coaches are human too and if they’re being yelled at by a parent, sometimes it’s hard to think it’s just the parent and not take it out on the girls. So it becomes a little bit harder in the gym and I just had to say to mum, ‘Just step out’. And she did, she was very good about it and stepped out.” (Lara, Gymnastics)

“We reinforced that in the first and last 15 mins of training they [parents] can be there, other than that they’re not allowed to watch. We just try to keep it professional, so just like you wouldn’t sit in on your child’s classroom. I mean, it is a bit hard sometimes for parents when they’ve got to be shoed away from the [gym] windows. When you get that kind of parent conflict with the coaches, you will find for some reason the athlete won’t succeed I guess it’s no different to school… so we’ve never allowed parents to come up to us about anything [at training].” (Lisa, high performance sports administrator)
“The good ones [parents] had a clear distinction with trusting the coach to do the job and knowing where their role as a parent stopped and the coach’s started because the potential for crossover was pretty high.” (Jacqui, elite swimming coach)

“…it’s not that I don’t want to [get more involved at training]. I just don’t want to step on their [coaches] toes.” (Linda, parent of junior elite athlete)

Each of these viewpoints aligns with the perspectives of several researchers and coach practitioners who urge the importance of positive parent-coach relationships in youth sport settings (Harwood, 2011; Knight & Holt, 2014; Smoll, Cumming, & Smith, 2011). Not only do parent-coach relationships have potential to influence the consequences of participation for young athletes either positively or negatively (Smoll et al., 2011), they can be motivationally draining for coaches (O’Connor, 2011) and in some cases, can be the impetus for coaches to leave the role altogether (Harwood, 2011). Lisa’s practices particularly support the philosophies of Harwood (2011) who highlights the importance of outlining the rules of engagement in the training environment with parents. Overall, such practices support the IOC’s (2015a) recommendations parents should acknowledge and respect coaches’ unique role as an authority figure within an athlete’s entourage; when adhered to within the “hotspot”, positive outcomes for athlete development were achieved.

6.2.5.2 School – community club (training environment) relationship

Given schools and community sports clubs share their own agendas for sports participation and competition, Olympians’ and the community considered the relationship they share could either be supportive or disruptive to athlete development. Interestingly, the two Olympians’ who reported difficulties in their school-community club relationships had both attended private boys schools, which had with strong sports cultures. Commitments to school weekend sport and academia were identified sources of conflict to their athletic development.

“I think the final year of school I was on the Australian junior team. I went to Europe, for the Worlds. But apart from that, there was very little impact [on school]. The problem was, in [private school], there was Sunday sport. I had to do some sort of sport and I was like, ‘I’m already tied up with my own weekend sport.’ The headmaster at the time said, ‘If you’re not going to do a certain sport [aligning with the school culture], what are you doing here?’ We made the call to leave [the school].” (Rhyse, Canoe/Kayak)
“Our headmaster was a very good cricketer for Australia and WA. In 1992 I went to the Australian team for juniors and in 1994 got selected again. One week was in the holidays, one week was outside the holidays. It actually took a lot of convincing for him to let me go because he always believed education comes first...so I guess that sort of shows you what type of school it was, even though our school was a very sporty school, no doubt about that... but I think if you hadn’t been trying to achieve in school, I think he could have certainly put the brakes on [sport].” (Troy, Swimming)

Given the role schools can play in encouraging youth sporting aspirations (Shehu & Akpata, 2008), the experiences both these Olympians’ had with their headmasters cannot be underestimated. Both scenarios highlighted potential disruptions to their athletic development and indirectly emphasised the importance of young athletes having a supportive school environment. This supports the IOC’s recommendations young athletes should give preference to sports-friendly schools that assist their career development (International Olympic Committee, 2015b).

Likewise, the community considered the strong culture of competitive sport in “hotspot” private schools was disadvantageous to community clubs, given their emphasis on loyalty and winning. The compulsory training and competition commitments required often interfered with the relationships shared with community clubs, especially given school competitions were often held on weekends. Not only was this considered to interfere with their immediate club training and athlete development, but the long-term relationships they share with community clubs. This was considered potentially detrimental to their ability to progress as senior athletes, especially in team sports. As a result, talented athletes may prematurely end their careers, which would be disadvantageous to the broader “hotspot” community, due to clubs losing access to athletes who would otherwise become the next generation of mentors/role models, coaches and volunteers who could assist with the ongoing growth of community clubs.

“The majority [of club members] send them [their children] to the private schools. They [private schools] are feral with their sport. Absolutely feral. To the point of where we had some problems with getting access to the kids because they’re training 4-5 times [per week] with their school.” (Paul, club committee member)
“PSA [Public Schools Association – private school sports competition] demands really just get in the way. For example, if we didn’t have as many PSA demands from school, they would have 3 training sessions a week [at the community club]. Our club only has one…I actually think that the schools are relatively detrimental to the development of athletes because they would make demands on the kids…they’re [private schools] actually getting in the way.” (Sally, club committee member)

“Kids should play school sport but they also need to be involved with clubs. If they’re not involved with clubs, when they finish school, what do they do? They could join one but if they haven’t been involved in that club for a long period of time, it’s actually quite difficult to embed yourself when you’re 17, 18. If they came in cold at the age of say 17, 18 because they’d just finished school hockey, they probably would struggle to fit in, because they don’t understand the culture of the club.” (Phil, club committee member)

Such factors essentially highlight the vital role unity, trust, loyalty and close social relationships have in the building of social capital within community sports clubs (Jarvie, 2006; Stoddart, 1988). Others from community clubs however, such as Colin the parent of an Olympian, believed private school sport did have potential to be beneficial for athlete development, as it provided additional opportunities for training and competition, which could lead to further skill development and mental toughness.

“I think they are reasonably complimentary, I think it’s quite an interesting test because if you’re playing school sports seriously and taking club sport seriously, then you do a lot of hockey training, you do a lot of exercise…our kids at one stage when they were in senior high school, they were probably training every day and sometimes they played school hockey on a Saturday morning and the top great club game on a Saturday afternoon, which is a massive challenge but it’s just a test of your mental strength and willingness to work really hard, otherwise you wouldn’t do both of them really well.” (Colin, club committee member and parent of Olympian)

Ultimately, each of these differing types of community perspectives highlight the potential need and value for schools and community clubs to form sustainable partnerships which have the potential to provide additional opportunities for training and competition, which may in turn enhance athlete development.
6.2.6 Exosystem

*Exosystem* influences encompass the broader social environment and community structures individuals are not directly part of, yet can still influence their development (Bronfenbrenner, 1979b). Within the “hotspot”, council, demographic and built, natural and social environment influences were investigated, alongside key organisations and wider political influences. These factors were directly targeted in interviews based on researcher understandings of *exosystem* influences, with the intention of gaining Olympians’ and community perceptions on indirect aspects of athletic development they may not have thought about previously.

6.2.6.1 Local councils and historical town planning

Overall, local councils and historic town planning were considered to play an important role in the “hotspot” regarding the provision and maintenance of several built and natural features within the area. Although few Olympians’ directly discussed council or the specifics of town planning, some members of the community were able to provide informed or historical background into these aspects of the “hotspot”. This history underpins several themes discussed later within this chapter, which will encompass Olympians’ lived experiences of engagement with these built and natural features.

Many of the local facilities (natural and built) were overseen by local councils and the “hotspot’s” presence as an established area of Perth was considered advantageous due to the broad availability of sporting clubs and facilities, which were considered fewer in number within recently developed areas of Perth’s sprawl. Historic town planning was considered well-placed around local topography, blocks of land were traditionally large and there were ongoing restrictions around infill and high-density housing. Access to open space and quality facilities was believed to contribute to strong PA and sports culture within the “hotspot”, alongside enabling community sports clubs to engage strong grassroots-level participation.

“What we have got is, a large amount of low density lots which are attractive to families with kids, so we’ve got per head of population more families and kids than the metropolitan average which is unusual because we’re an inner-suburb and there’s a lot of pressure on us to increase our densities because we’re close to the city…we’ve resisted that for the prime reason that we’re catering for families…and they play a lot of sport.” (Mayor A)
“I think it’s all the town planning I think originally when the Western Suburbs were first developed, there was a lot of effort put into maintaining lots of bush land and lots of park lands, lots of open space, everything by the river as well at ease, you always can have open space close to the river…so I think it's all that really.” (Colin, club committee member and parent of Olympian)

“The council have been very supportive…we’ve got around seven grass grounds and the club house and the council has been very supportive in keeping those grounds to a high standard which is important for our juniors.” (Phil, club committee member)

Although its full history was not discussed by participants, it was discovered the “hotspot’s” idyllic town planning can, in part, be traced back to the Perth Endowments Land Act 1920 and the vision of influential town clerk William Bold, which pertained to his education of the Garden City and City Beautiful movements (Constable, 1998; Garnaut, 2000; Stannage, 2016). Some suburbs within the “hotspot” went on to become well-known Australian examples of Garden Suburbs which aim to promote the wellbeing of residents through opportunities and space for outdoor recreation as integral to supporting public health (Frank et al., 2003). Comparatively, it was perceived that Perth’s more recently developed areas did not have parity regarding access to sports facilities and open space, in part due to changes in town planning, alongside fewer restrictions on infill and high density housing with small backyards (Middle et al., 2015).

“…a lot of that infill started which has increased the population in those suburbs, but doesn’t reduce the size of the backyards. The Western Suburbs still has a lot of park space and even though there’s been that infill, there’s still a lot of established parks that don’t seem to exist in a lot of newer areas.” (Jenny, Athletics)

“In the old days, when Perth area seemed infinite, they put a lot of large sporting areas in [established areas of] Perth. You look at the new subdivisions, say the last 20 years, you get an area, the size of a courtyard to be your public space. I think there hasn’t been a football oval put in it for about 20 or 30 years for instance.” (Mayor B)

Furthermore, the population size of these newly developed suburbs and their associated LGA councils was often much larger than within the “hotspot”, which, as evidenced in Study 1, has council area populations much smaller than the Australian and Greater Perth averages (Gooding, 2012). It was believed in contrast, councillors within the “hotspot” had more direct contact with the population to hear about their needs, which was advantageous for providing sport and recreational facilities.
“… the smaller the council, the closer it is to the population… it comes back to elected members knowing members of the community.” (Mayor A)

History determines that these observations may have practical and beneficial implications for the “hotspot” as it stands today. Over the last century, the number of local councils in Australia has decreased due to amalgamations between LGAs (Dollery, Crase, & O'Keefe, 2009; National Office of Local Government, 2005). Perth’s LGA boundaries however, have undergone little change since the end of the nineteenth century and on average have been much smaller than those in other Australian capital cities. Historically, WA’s population was too scattered and poverty stricken to build a level of government below that of the state; however, over time financial incentive motivated each small area of development to become a separate town. Most notably, in Perth, an inverse correlation exists between council population size and SES, particularly in the city’s more established areas. Partially, this is due to the residents living within these high SES suburbs having influence over preventing the occurrence of proposed LGA boundary changes (Jones, 2009).

Accordingly, this has potentially allowed for a greater amount of funding and resources to be directed towards a relatively small geographical area, such as the “hotspot”, due to these unusual political boundaries. Aside from being of potential advantage to the “hotspot” regarding the accumulation of open space and facilities for sport, Mayor A adheres with Dollery and Crase’s (2004) views that a significant advantage of smaller local councils is the opportunity for ratepayers to be in contact with local councillors; potentially, leading to services being produced more efficiently. Overall, it could be considered the historic town planning which took place within the “hotspot”, alongside subsequent council and political influences, may have indirectly had positive outcomes for athlete development in the following decades. As will be discussed, much of this influence pertains to access to open space and quality sporting facilities, which provide developing athletes within the “hotspot” opportunities for unstructured play and practice.
6.2.6.2 Demographic of the “hotspot” area

Aside from the benefits previously discussed in relation to family SES, both Olympians’ and the community perceived the affluent demographic of the “hotspot” to be advantageous for athletic development. At a community level, the desirable town planning, ease of access to sporting facilities, open space and large backyards were believed to be associated with demographics. Given the well-educated demographic of the “hotspot”, the community felt locals of the area were more able than those of a lower SES to exert power and influence over council and government decision-making when required. This was perceived to be a key benefit regarding issues such as infill and increases in high density housing which are broadly debated current affairs topics across Perth (Moodie & Trigger, 2015).

“…people in the Western Suburbs are probably more able to influence decision making and stop areas being developed that they don't want to get developed…from time to time the government or the University [UWA] want to develop it [land] and remove some bush or park lands and the local community is very powerful and very strong…they’re very understanding of how to influence governments and local authorities' decision making processes.” (Colin, club committee member and parent of Olympian)

These views align with Jones (2009), who acknowledges residents living within Perth’s ‘golden triangle’ of western suburbs (the affluent area between Subiaco, City Beach and Mosman Park, which encompass most of the suburbs overseen within the “hotspot”) are more likely to have influence over preventing changes occurring within their local councils because they are well-educated, articulate and of high SES. Similarly, these influences and connections were considered beneficial for “hotspot” community sports clubs who could benefit from the social capital and financial backing of their members. In some cases sponsorship, large donations and political connections were believed to be advantageous for the acquisition of costly new facilities, such as synthetic hockey pitches.

“There were some really big donors, people who were part of the club and they could afford to give…to write a big cheque…so we exceeded the [fundraising] target and we got a good turf.” (Bill, club committee member)
This is perhaps not surprising given sports clubs are naturally associated with social capital and its observed benefits, including social interaction, sharing and a sense of community (Australian Bureau of Statistics, 2011b; Okayasu, 2010). At the family or individual level, finances were also believed to strongly influence the number and types of sport “hotspot” residents became involved with. Greater financial resources allowed “hotspot” residents to have increased exposure to a broad variety of sports beyond the traditional Australian football (AFL) and netball prevalent in lower SES areas (Eime et al., 2015). Accordingly, this financial position may have enhanced the opportunities for potential Olympians’ and other elite athletes from the “hotspot” to find the sport they were best suited to and in turn heighten their chances of accessing elite pathways.

“…they’re not going to talent scout you if you don’t have the money in the first place to go to a competition. I’ve just been kind of lucky to find something that I’m good at and then my parents were able to support me.” (Lucy, Gymnastics)

“I think it [affluent demographic] gives kids an opportunity to understand what they’re good at and what they enjoy” (Peter, club committee member)

These observations align with research, which suggests individuals from a high SES background are most likely to be involved in PA and organised sport (Eime et al., 2013; Vandendriessche et al., 2012) and accordingly produce stronger results for fitness and motor skills in youth (Klein et al., 2016). Furthermore, it is known sports choice is likely to be influenced by SES. Sports requiring water and expensive equipment, hockey, aesthetic sports (for example, gymnastics) and ‘niche’ sports (for example, canoe/kayak and rowing) are known to have links to higher SES (Eime et al., 2015; Federico et al., 2013; Kirk et al., 1997) and are characteristic of several Olympic sports represented by the “hotspot”. Alternately, individuals from lower SES backgrounds may not have the economic, social and cultural capital to partake in these activities (Casey et al., 2011).

Beyond opportunities for initial exposure to organised sport, affluence was considered highly beneficial for aspiring athletes progressing through, and sustaining involvement in, elite pathways for amateur and Olympic sports. Paying additional fees associated with representative squads and teams, away trips and equipment was considered to be more achievable for families residing within the “hotspot” and was a factor often, yet reluctantly discussed as being favourable to successful athletic development. Comparatively, it was also acknowledged that regardless of talent or desire some athletes in less affluent areas may be unable to progress with elite sport if their family or community demographic proves unconducive to athletic development.
“It’s certain that the demographic of the area…they ["hotspot" suburbs] are higher socio-economic areas. It’s expensive to play sport and it’s becoming more and more expensive so that’s got an impact on kids’ opportunities. If the family can’t afford it, they can’t afford it.” (Jenny, Athletics)

“Unfortunately sport has gotten more expensive. You see the fees creep up and you need to pay for the insurance, doctors, all those different things that weren’t there before. But unfortunately, that’s the nature of the game.” (Troy, Swimming)

“…it’s kind of cringe worthy saying this, but I think it is quite a wealthy part of town. I think as a result there’s a lot more people who can easily afford to send their kids to extra training and away on trips and stuff like that…if your parents can afford to send you somewhere even if it’s on State trips, then you’re much more likely to succeed than a kid who doesn’t have the same opportunity.” (Mitchell, club committee member)

“Swimming's not a cheap sport…to compete as a Western Australian you had to travel to the East Coast. Those that had the money were able to do that. More exposure to competition gets you race ready, so to excel, you need that exposure.” (Jacqui, elite swimming coach)

Financial resources were considered key not only at a grassroots level, but also at the elite level, as many sports at the summer Olympic Games have not traditionally been lucrative, compared to purely professional sports. This was perceived to be attractive to individuals of a higher SES who often studied at a tertiary level, which resulted in sport often not being viewed as their primary career. Additionally, extended involvement in comparatively amateur sport was considered sustainable for those of a higher SES, whereby many “hotspot” families could afford to financially support their children well into adulthood. This coincides with Dweck’s (2006) views affluent families can allow their children to take greater risks and sustain effort until success is achieved.

Conversely, it was considered that individuals from low SES communities may be more attracted to professional sports due to their more commonly lucrative nature, in situations where another career path was not clearly identified for them. This supports research, which has found some professional sports have high representations of low SES athletes for similar reasons (Coakley, 2004; Kuper & Szymanski, 2009).
“…there are a lot of very, very wealthy people...when their kids play sport they’re not necessarily going to be doing it as a financial career. So the Olympics I reckon would almost have more allure...you're going to represent your country, you're going to go to university but it's not like you've got to drop everything and play football because you can make a lot of money out of football, or golf or cricket.” (Karen, parent of a senior elite athlete)

“…the socioeconomic part of things means that you are luckier to take up a bigger range of sports and maybe be able to stick with the ones, the Olympic sports that don’t make money…kids can stay at home much longer and their parents will help to fund their sporting career.” (Andrea, Canoe/Kayak)

Consistent with these views, a recent Australian study found athlete’s competing at the highest levels are often characterised by having affluent, mono-lingual, well-educated, two-parent Australian born families in high SES metropolitan areas (Eime et al., 2013). These findings align with Study 1 descriptive demographic data, where it was determined the “hotspot” is comprised predominantly of residents who speak only English at home (83%), had high tertiary education rates (59.9%), median weekly household income (AUD $2,188) and two-parent families (50.1%), with relatively low percentages of single parent families (11%). Some community members acknowledged these statistics when discussing benefits of the “hotspot” towards athlete development.

In this area you will probably find 90% of families intact...the Australian family that we think Australia has...in the 1970s or 1950s...we’ve still got that way of life. Same infrastructure, same big blocks, same style of families. If you have two parents it’s now easy to get to sport, they can find the time to do that.” (Mayor B)

Providing a contrary opinion, some members of the community who had been elite level coaches and sports administrators in the “hotspot”, had observed too much affluence, comfort or life stability had been disadvantageous to athletes who had otherwise demonstrated potential.

“It’s almost their own worst enemy being wealthy...in the summer period where you want athletes to be training, those people have their boat, their holidays home at Margaret River, or in more recent times, they fly to Europe for holidays...go to Paris or South-East Asia.” (Brian, elite swimming coach)

“…some of those children [from the “hotspot”] won’t have a very strong work-ethic so some of the girls who come from the Western Suburbs, their parents don't support them to grit it, they don't have the grit.” (Lisa, high performance sports administrator)
These observations support research on the inverted-U hypothesis, which has found too much of any ‘good thing’ such as affluence may lead to potentially undesirable outcomes (Grant & Schwartz, 2011). Accordingly, this may suggest wealth alone is insufficient for athlete development or Olympic success. Beyond financial opportunities present within the “hotspot”, Olympians’ especially considered the values and attitudes associated with affluence to have greater bearing. Several Olympians highlighted many “hotspot” residents had achieved success in various domains, which enabled them to reside in the premier ‘golden triangle’ area of Perth. Growing up in this environment enabled exposure to a variety of high achievers; not just sports people. This allowed for an upbringing where a “high performance pedigree” prevailed and where success and high achievement were “self-perpetuating” or “almost normal”.

“It is a very middle class area where there is high expectation and a confidence that you can do great things...achievement is certainly encouraged.” (Monica, Gymnastics)

“...the success in this area is about the personal skills that people have learned from such things as that culture....that's why they have risen to the surface...it's not necessarily about how athletic they were in the first place...you're learning skills of how to be a high-performing person.” (Sonya, Hockey)

“The families that live there have experienced some point of determination to become wealthy, so determination naturally must exist in the family.” (Troy, Swimming)

“...the Western Suburbs is where a lot of successful people live, that's where all the private schools are, people are generally very ambitious for their kids...there's a lot of successful people who are good at what they do and work hard and are dedicated to their jobs and live their lives that way...that's just the environment that the children tend to grow up in.” (Colin, club committee member and parent of Olympian)

These opinions support research which suggests SES has potential to influence not only opportunity, but also perceptions of destiny within sport (Kontos, 2009) for better or worse. Regarding Coubertin’s ideals of Olympism, many of the findings relating to the “hotspot’s” demographic may be alarming, given the underlying ethos of the modern Games is to keep sport as free as possible from economic disparities, even in this era of increasing professionalisation among Olympians. These ideals of Olympism are in line with the goals of the Olympic movement, to ensure that Olympic sports exhibits principles of equal opportunity and award based on merit (McNamee & Morgan, 2015), in accordance with the sport for all ideals. Ultimately, awareness of the demographic features of the “hotspot” may indicate that this does not always occur in reality.
6.2.6.3 Physical environment (Built)

6.2.6.3.1 Access to built facilities

Commonly, Olympians’ and the community discussed the ease of access to quality built sporting facilities within the “hotspot”. Local councils provided some of these facilities, but several of Perth’s key sports facilities were conveniently located within the “hotspot”. Facilities often corresponded with sports clubs and programs, which many believed provided residents with greater incentive to be involved in sport especially when combined with the existing school sports facilities and affluence of the area.

“There is this beautiful weather, you’ve got the beach right there, you’ve got big facilities so sport becomes a positive experience. You don’t have to drive for miles, it’s not an effort…[so] that becomes an attractive sport to take up…so I think that’s got to help.” (Jenny, Athletics)

“…there’s a soccer centre that’s just opened, and they have rugby just down there…you’ve got swimming, gymnastics, athletics, all that stuff just around here and if you’ve got money to be able to pay for them, it’s so easy to be able to do any sport that you want basically it’s easy to get around…if you want to be successful at something, you’ll find the sport where you’ll be most successful around the area.” (Lucy, Gymnastics)

“…if someone is talented in this area then they can go wherever they want because there’s a good level of competition, facilities, coaches…so if they’ve got the talent they can be nurtured and developed. In another area, if someone’s got the talent they just may have none of those things, or they may not be able to afford it.” (Mayor B)

“Everything they [developing athletes] need is in this area, they don’t need to travel outside [the “hotspot”].” (Travis, coach of elite junior athletes)

Besides their availability in schools, local swimming pools were a built facility, which were particularly prominent. Both local council and state government funded these public, Olympic-sized pools. Community stakeholders suggested this density of swimming pools within the “hotspot” or a short commute from its centre, was not equal to other areas of Perth. This was considered to be advantageous for several water-based sports, especially swimming, which was the prime contributor to “hotspot” Olympic representations.
“... the Western Suburbs have a very high density of swimming pools, that's certainly a noticeable thing...there's Beatty Park which would've been the Empire [Commonwealth] Games pool [just outside the “hotspot” area], then there's Bold Park which is right next door to Perry Lakes, Claremont...whereas if you go in other directions they are fewer and far in between.” (Tracey, parent of junior elite athlete)

“There's three 50m pools in it [HBF Stadium], a diving well and a water polo pool.” (Paul, club committee member)

Synthetic hockey pitches and their prevalence in the “hotspot” were another key facility the community felt was notable, when compared to the Perth’s access overall.

“...in the early days it was on grass...you could play everywhere because it was grass. Now because it's turf, you look at our turfs...Hale, YM and Wolves have got Shenton...we have now got two turfs at UWA [University of Western Australia]...Rockingham is so far away it's more or less the country. Joondalup's so far away, then there's only PHS [Perth Hockey Stadium]. They are the only turfs. So we've got majority of the turfs in the Western Suburbs.” (Karen, parent of senior elite athlete)

Given the number of these hockey facilities has expanded in recent years and the majority of the “hotspot's” Olympic hockey representation (1984-2012) were in the 1980’s, it is unlikely that access to this built facility was a key sport-specific factor pertinent to the “hotspot”. Perth’s main synthetic hockey pitch of that era was also the first of its kind in the Southern Hemisphere and has been located at the WA Institute of Technology (now Curtin University) since 1979 (Hockey WA, 2015); this facility is located approximately a half-hour drive from the “hotspot”.

Overall, Olympians' and community views correlate with research that has determined high SES communities are often known to have greater access to facilities (Crawford et al., 2008) with youth more likely to engage in sport and PA when these facilities are both proximal and affordable (Giles-Corti, Foster, Koohsari, Francis, & Hooper, 2015; Kolbe-Alexander et al., 2015; Markevych et al., 2016; Weimann et al., 2015). Research also supports ease of access to sporting facilities is essential for the emergence of athletic expertise (Henriksen et al., 2010b; Rossing et al., 2016; Weissensteiner et al., 2009). For these reasons, the wide variety of built facilities available within the “hotspot” may have been a contributing factor to strong athletic talent development arising from the area.
6.2.6.3.2 Roads and traffic

Olympians’ and adults who grew up in the “hotspot” shared the general consensus the area had traditionally been safe for children to travel independently, play outside unsupervised and walk or cycle to nearby sporting and recreation facilities (built and natural). In part, they considered this was due to relatively low levels of traffic and perceived safety. They believed these factors contributed to plentiful and safe opportunities for outdoor play, PA and attending sports training without parental supervision. Comparatively, it is known urban areas with heavy traffic and poor conditions, often discourages PA and children’s independent mobility (Villanueva et al., 2013; Ward Thompson, 2013).

“The ease of getting around is a huge one…it is massive. The ease of access to different sporting events…I had to ride my bike everywhere. Crossing roads and stuff like that wasn’t an issue. I think there was a community feel. All the kids would just run and meet in parks and stuff like that. I think that got us out a lot when we were younger.” (Rhyse, Canoe/Kayak)

“We used to walk to training quite often, ride our bikes, catch a bus, it’s kind of safer and shorter and I think that’s definitely part of it.” (Mitchell, club committee member)

They also considered that lower levels of traffic and unsupervised outdoor play in childhood may have been a ‘sign of the times’, with children nowadays relying more heavily on parents for access to sport and facilities. These views are supported by research which has shown that compared to previous generations, children nowadays spend much less time engaged in free outdoor play (Malone, Birrell, Boyle, & Gray, 2015) due to over-protective parenting styles, fear of traffic and ‘stranger danger’ (Faulkner et al., 2015; Little, 2015; Malone, 2007). Such knowledge may highlight that opportunities for children to have unsupervised outdoor play in a safe built environment can have benefit for PA levels, formal and informal sports participation and subsequently athlete development.

Beyond independent childhood travel and play, relatively low levels of traffic and proximal access to key sports facilities were considered ongoing advantages to families in the “hotspot”. Shorter commutes to training or competition may result in parents and children remaining committed to their sporting endeavours, alongside less fatigue and shorter recovery time for athletes who did not need to spend hours commuting to access Perth’s prime sporting facilities.

“…some people may come from outside the area and have to travel an hour to get there, but for locals or relative locals you can actually spend your time training and not sitting in traffic getting from A to B.” (Bill, club committee member)
Overall, such factors were considered valuable from a time, energy and training point of view, as environmental features including traffic, neighbourhood safety and general access to recreational facilities, have significant potential to assist or deter residents from PA and sport engagement (Ball et al., 2007; Kolbe-Alexander et al., 2015; Rodríguez et al., 2012; Siqueira Reis et al., 2013; Zenk et al., 2009); this may ultimately be influential for athlete development.

6.2.6.3.3 Backyard and block of land size

Although some Olympians’ acknowledged the importance of unstructured play in their early sports histories, several Olympians’ and the community considered the large backyards of many suburbs within the “hotspot” were particularly influential in providing opportunity for these experiences. This space afforded ample opportunities to play and develop sporting skills outdoors, particularly when facilities were also available. Backyard swimming pools, gymnastics equipment, tennis courts, flying foxes and other play equipment, and even a designated area for archery, were among the types of facilities present.

“Dalkeith was a premier suburb for that [large blocks of land]…it had a pool at the front that we’d swim in all day when we could. We had a backyard that had the balance beam…one year for my birthday he [elderly neighbour] made me a wooden beam. I remember getting mats for my birthday, that my sister and I would tumble over… and my dad had bought me these metal, very basic monkey bars…I used to just swing around on them all the time…and this huge brick wall on a quarter- acre block. You would still run up and down the sides. My brother had an archery area…the opportunity to practice at home was there 24/7.” (Monica, Gymnastics)

“We had a sand box back there and a flying fox and dad built a tree house and we used to get up to so much trouble. That was the norm. I know a lot of the gymnasts that come from fortunate families and they bought them a beam and bought them a set of play bars to put in the back yard…and a lot of families have pools as well. Well, at least in the Western Suburbs they do.” (Lara, Gymnastics)

“Oh, it was definitely a benefit for us. I mean, my parents lived on a relatively decent sized block in Floreat and I grew up with 3 brothers and a sister, we basically did nothing else but play sport in our backyard. We played everything…I remember looking at my parents block once [on Google maps] and I think there’s…and we live even less than 5 minutes from the beach…and if you look at that block, there are like 40 houses and 32 of them having swimming pools in the backyard.” (Mitchell, club committee member)
“…City Beach, Floreat, that’s another area that has big backyards, big houses…one of Alex’s [son who is a senior elite athlete] friends used to have a cricket pitch in their backyard…so he had a cricket pitch and a bowling machine and everything!” (Bill, club committee member)

These perceptions align with Study 1 descriptive demographic data, which demonstrated that the majority of “hotspot” residents live in separate detached houses (76.6%). Although, the Claremont LGA lowers the “hotspot” average with only 65% of occupied private dwellings being detached houses, when the LGAs are observed separately, Cambridge (79.8%) and especially Nedlands (85%) LGAs had a high proportion of detached housing. Comparatively, for Australia and Perth overall, it was reported that 75.6% and 78.1% respectively lived in detached housing in 2011. Potentially, the presence of a high number of detached houses across several areas of the “hotspot” may have provided greater opportunity for larger backyards and more unstructured, outdoor play during childhood, compared to if the “hotspot” was characterised by high-density housing.

Similar to discussion earlier in this chapter, such opportunities have likely arisen due to advantageous historic town planning, including Floreat and City Beach’s garden suburb design, alongside Perth being one of the most low density cities in the world (Alexander & Greive, 2010), where homeowners have traditionally been averse to increased housing densities (Holling & Mckenzie, 2010). Furthermore, the high SES of the “hotspot” can also be considered attributable to this finding given greater backyard size and provision of recreational facilities in the home environment are known to have a strong influence on outdoor play and childhood PA in Australia (Spurrier, Magarey, Golley, Curnow, & Sawyer, 2008). Inadvertently, the facilities, space and opportunity for deliberate play (Baker & Côté, 2006) in the home environment may have contributed to a unique advantage provided by the “hotspot”, which subsequently enhanced athlete development.
6.2.6.4 Physical environment (Natural)

6.2.6.4.1 Access to natural facilities

Natural facilities including beaches, parks, bush land and the river, were considered by both Olympians’ and the community to be desirable features of living in the “hotspot. This is unsurprising, given humans are biophilic beings who have always shared an inextricable connection with nature, due to its vital importance for public health, wellbeing and development (Dannenberg & Capon, 2016; Kellert, 2012; Keniger et al., 2013; Wilson, 1984). In conjunction with proximal built facilities, access to natural facilities was believed to further encourage PA, outdoor play and unstructured sporting skill development for children and adolescents. Further opportunities for swimming provided by beaches and the river, were also considered integral to the strong local swimming culture and participation in water-based sports.

“We lived next to a park so…there was always one of them [children] out there playing hockey or cricket…also the time the parents take to play with their kids…most parents would go and run around and play with their kids rather than do something at home.” (Bill, club committee member)

“…the beaches are so close, people literally start teaching their kids to swim before they can walk.” (Mitchell, club committee member)

“I’d often go down just with one brother, it was maybe 100, 150 meters down the road from Perry Lakes, which is just a really big grassed area…so, I’d just walk down there.” (Felicity, Hockey)

These observations and personal experiences are supported by research, which has found the quantity of green space in a living environment can not only enhance overall perceptions of general health (Kyttä et al., 2012; van den Berg et al., 2015), but engage residents in more frequent PA (Giles-Corti et al., 2005; Wheeler et al., 2012), especially when neighbourhoods are well-designed and attractive (Giles-Corti et al., 2005; Kolbe-Alexander et al., 2015; Sugiyama et al., 2013). Coastal proximity is also known to enhance MVPA levels and health, alongside potentially counteract childhood obesity (Ashbullby et al., 2013; Wood et al., 2016). Beyond the benefits of these natural facilities for childhood health, promotion of sport and PA participation alongside early athletic development, some Olympians’ believed they were also pertinent to elite training and recovery purposes.
“The other thing being at Dalkeith is that it’s quite near the river. The river had these really long stretches and Mum and Dad used to let us just disappear down there by ourselves. On the occasional morning off, I used to go for a run along the river on that park land and I think how lucky I was. I could just easily walk out of my house, down some steps and have this amazing open space that was really safe.” (Monica, Gymnastics)

“…we used to say we’ve got this amazing grass track that helps us with less impact on our legs and stuff like that so that was one big advantage that we’ve had and the ocean. We’d go down the beach and have training sessions and swim to sort of recover…that made you feel like you had a better situation.” (David, Athletics)

Both Olympians’ comments highlight the beneficial outcomes of proximity to natural facilities, not only for PA, but also for training and athlete development. Given the increasing urbanisation and density of cities, public open space will become increasingly important as private open space declines (Giles-Corti, Ryan, & Foster, 2012). Overall, the “hotspot’s” availability of public and private open green space can be interpreted as a contributing factor to enhanced athlete development which may have provided advantages over communities without these features.

6.2.6.5 Social environment

6.2.6.5.1 Perceptions of safety, a sense of community and shared values

In conjunction with ideal access to built and natural facilities, Olympians’ and the community perceived a strong sense of safety and community within the “hotspot”. This correlates with Australian research, which found there is a significant relationship between high quality public open spaces, a sense of community and perceived safety (Francis, Giles-Corti, Wood, & Knuiman, 2012). Partially, this was due to the low levels of traffic alongside the family-oriented and high SES nature of the “hotspot”.

Knowing their neighbours and feelings of being safe, due to perceived low levels of crime were contributing factors to unsupervised outdoor play taking place during childhood. David recalled his childhood was “pretty protected”, in part due to growing up in what he described as “Pleasantville”. When describing the crime and anti-social behaviour he had heard about in other areas, he remarked “I don’t think that would’ve happened in Floreat”. Other athlete’s shared similar sentiments about the benefits of the “hotspot’s” social milieu for unstructured childhood play.
“I know definitely if I was a mum, I'd feel comfortable letting my kid’s just walk to the park once they’ve passed a certain age in the Floreat, Cambridge area. I think that the crime rate is fairly low in those areas as well, so, yes I think that helps a lot. Whereas other areas, I'd definitely be more hesitant to let them out of my sight or not be with them. (Felicity, Hockey)

“The area was very family-oriented…it was fine for your kids to go to the park or the beach and things like that and it was possibly due to the affluence of the suburb. Probably, people felt safe.” (Alex, senior elite athlete)

These perceptions support previous research, which suggests that neighbourhood safety and crime are respectively likely to assist or deter residents from engaging in active transport, PA and sport (Rodríguez et al., 2012; Ward Thompson, 2013; Weir, Etelson, & Brand, 2006). The presence of these safe environments within the “hotspot” could be thought of as being valuable to athlete development in childhood, as immediate surroundings are considered highly influential for children’s opportunities to play outdoors (Kytta, 2002), with freedom in this domain likely to elicit greater levels of childhood PA (Moore & Cosco, 2010) and unstructured practice.

Such opportunities for safe outdoor play were considered a strength of the “hotspot”, particularly when Olympians had their childhoods predominantly 20-40 years ago, prior to changing media and societal perceptions towards children’s unsupervised, outdoor play. For Olympians, experiencing early development in this type of environment was likely to have had a positive influence, given much of an individual’s sporting experiences can be directed by the area in which they live and the people whom they live amongst (Casey et al., 2011; Eime et al., 2015; Stoddart, 1986). Additionally, a strong participation culture for sport and PA was viewed to exist within the “hotspot” and in turn contribute to a sense of shared local values and communal identity. Directly or indirectly, families, friends and local schools reinforced this value, such that sport and PA were viewed as a regular aspect of life.

“...as a kid here you’re out of the norm if you don’t do sport. If you’re at primary school and you’re not doing some sort of sport outside of school, it weird, it’s different.” (Lara, Gymnastics)

“It’s a massive part of the Western Suburbs, just the participation culture. It really is a major thing...just the culture of being active.” (Darren, coach of junior elite athletes)

“...if you go down to the local park after school or early evening, there’s always people down there playing some kind of sport, or a local running group set up on the parks…it’s definitely encouraged in those areas.” (Felicity, Hockey)
In part, the well-educated and high SES demographic of the “hotspot”, as evidenced by Study 1 and Olympians’ and community perceptions, was considered a contributor to this physically active sports culture. This is a known factor from prior research, which has shown high SES communities are more likely to be involved in sport and MVPA (Eime et al., 2015; Kolbe-Alexander et al., 2015) than to low SES communities, where there is greater propensity for residents to lead physically inactive lifestyles (Martinez et al., 2008). Partly, this is due to the availability of built and natural facilities in high SES areas compared to poorer demographics (Crawford et al., 2008; Moore et al., 2008). Ultimately however, some individuals also acknowledged that this sports culture was not only endemic to the “hotspot”, but was a shared feature of Perth life, due to other exosystem factors including climate, Western Australian (WA) state identity and broader political influences.

6.2.6.6 Key organisations

6.2.6.6.1 The University of Western Australia (UWA)

WA’s oldest and Australia’s 6th ranked university (Australian Education Network, 2016), UWA is located within the “hotspot” and was considered to be indirectly influential to athlete development through access to key sporting facilities and the inception of WAIS. History sheds light on key events and people from the University being core to this influence. In the 1960’s, a bequest from Dr W.S. McGillivray was used for the establishment of the McGillivray playing fields in Mount Claremont, which later developed into UWA Sports Park in the late 1970’s-early 1980’s, when Australian sport was being revolutionised (Barker, 2013). Intended for UWA use, the clubs and facilities associated with these playing fields became easily accessible to the general public. Similarly, key sporting facilities on adjacent land, including HBF Stadium (formerly known as Perth Superdrome and then Challenge Stadium) and WAIS High Performance Service Centre, both of which are leased through the WA State Government (The University of Western Australia, 2014) also became easily accessible. During this time, WAIS’ was founded at UWA (1984) where Professor John Bloomfield, a key influence in the Australian Institute of Sport’s 1981 inception, was based. This enabled him to become a central influence in the establishment of WAIS (Pyke, 2010) and elite athlete programs in WA.

Some Olympians believed a direct implication of this history was the provision and maintenance of quality facilities, which had direct benefits for their athletic development. In particular, the grass athletics track was held in high esteem, with its quality perceived to reduce injury and enhance the longevity of the athletes’ careers. David purported this facility to possibly be “the best grass track in the world”, whilst Jenny believed it was at least “the best grass track in Australia”.

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“...the University maintains it [athletics track] magnificently – it certainly is a fantastic facility and we are really lucky to have it. So in terms of the longevity of my career, I was 32 when I retired, which was old back then, I did most of my training on that track. So in terms of reducing injuries and impact and all that sort of things, it was fantastic. Whereas other places don’t have that sort of facility…I haven’t seen a better one.” (Jenny, Athletics)

Jenny’s comments in particular, correlate with research findings which reflect quality grass fields can be considered an ideal surface for preventing sports injury (Bussey, 2012). Potentially, the combination of quality facilities, beneficial partnerships and local expertise may have brought elite sport opportunities to Perth earlier than many parts of Australia, which could be interpreted as having positive sport-specific influences on some “hotspot” Olympians’ athletic development.

6.2.6.6.2 Western Australian Institute of Sport (WAIS)

Each of the Olympians interviewed in Study 2 had been affiliated with WAIS at some stage in their career. WAIS, Australia’s second state-based sporting institute which commenced in 1984 (Pyke, 2010), was located within the “hotspot” and had a strong reputation amongst Olympians’ and the community for its programs and facilities. Due to being one of Australia’s first sporting institutes and being isolated from other states, WAIS was considered ahead of its time and a pioneer of strong programs.

“Wally Foreman and Lisa fought very hard to get the program over here, and since then, we’ve actually developed our own style and our own way of doing things and in doing that, I believe that the gymnastics program is definitely one of the best in Australia.” (Lucy, Gymnastics)

“It’s a great institute, it is very well structured, and really good training schedule and all of that, and you’re tested regularly to meet standards...you get a lot of feedback...if you’re cut from the Australian team or dropped to the development squad, they would monitor why you got knocked and what you need to improve on...so I think they have really good processes in place to help you achieve your best.” (Felicity, Hockey)

The main perceived benefit of having WAIS’ world-class facilities and programs situated locally was its ability in keeping “hotspot” Olympians close to home with their entourage and support networks. This was considered to enhance athlete development, particularly for gymnasts who were elite athletes from childhood. Additionally, it meant that local role models throughout WA and in the “hotspot” could continue to have influence within their local sports clubs.
“My parents would never let me relocate to Canberra anyway…WAIS being there allowed me to get to the Olympics. It did provide some normality…whereas in Canberra, I don’t think I would have survived… I’ve always felt I had a sense of control over my destiny in WA.”
(Monica, Gymnastics)

“I know with gymnastics, we used to [pre-WAIS], once we [WA gymnasts] were 12, we had to travel to the AIS and then that was your base…and so that was really hard on the families…and to be honest, I think if I was 12 and they offered me [a place at the AIS], I probably would have said, “No, thanks” and stopped [gymnastics].”
(Lucy, Gymnastics)

“I think WAIS is better - the concept of having local Institutes. I think that is highly preferable compared to ripping all of the good role models out to whack them all in Canberra [AIS].”
(Paul, club committee member)

Such factors cannot be underestimated, as it is known just how valuable the entourage are within an Olympians career (International Olympic Committee, 2014, 2015a) and in supporting overall athletic development (Rees et al., 2016). As history tells, this was also a hotly contested issue at WAIS in the 1990’s, when concerns were raised about the wellbeing of young athletes being moved to the AIS at Canberra (Pyke, 2010).

Another perceived advantage of WAIS being located within the “hotspot” was the enhanced proximity to facilities, coaching and programs, which enabled getting to training “a lot easier” (Felicity). This convenience meant greater time could be spent on rest and recovery, with some observing the comparative challenges of athletes who had to commute from outside the “hotspot”.

“I think, if they [young athlete’s] have to travel half an hour, 45 minutes to training everyday then there’s a big drop-off probably percentage.”
(David, Athletics)

“They’re sort of in the middle of everywhere [people/athletes living in the “hotspot”]…it’s not hard to get to WAIS, it’s not hard to get to the water to train. It’s all within close proximity. I think that’s an advantage…and I think the travel makes a difference because it’s tiring and demanding.”
(Roger, elite rowing coach)

Overall, it is evident the role of WAIS and its proximity to the “hotspot” cannot be underestimated in the role it had for Olympians’ continued athletic development, once they had reached the elite level.
6.2.5.6.3 Australian Institute of Sport (AIS) hockey based in Perth

Although the AIS is located in Canberra (Eastern Australia) with the majority of sports programs initially based there, Perth has hosted the decentralised AIS hockey program since 1984 (Pyke, 2010). Olympians’ and individuals in the hockey community considered this factor to be advantageous for hockey in broader Perth, rather than the “hotspot” alone. Having the AIS hockey program based in Perth has allowed talented WA hockey players to remain close to their entourage support networks, whilst inheriting Australia’s best hockey players to play at local clubs. Many of Perth’s hockey clubs have traditionally been located within the “hotspot”, which accordingly brought additional elite athletes to an already thriving area.

This factor was believed to strengthen local competition and enhance exposure to elite sport, as well as attract government funding, quality facilities and international-standard coaches to the broader Perth hockey scene. Furthermore, it was considered to have potentially provided junior and senior elite athletes with opportunities to compete against international-standard athletes and in front of their coaches, thus, enhancing their athletic development. This strengthens local competition and provides opportunities for developing athletes, although at the expense of other Australian communities who have their elite athletes and role models removed from their home environment.

“…it’s been good for Western Australia in that it underpins the local competition but it does damage elsewhere perhaps…I think it’s actually an advantage [in Perth] because the elite players improve the quality of the local competition. Kids get to play next to them…so I think it’s a plus.” (Ray, Hockey)

“Being based in Perth you get more opportunities because there will be an Australian training camp and they might want to play some games and they will be like ‘Oh, we need some extra players and they would ask some of the WAIS guys’. So you just get more opportunity to get in front of people…you’ve got the Australian coaches there and you know, it’s an opportunity…if you were from Sydney and you were at a similar level obviously you don’t get that opportunity.” (Alex, senior elite athlete)

“All the Kookaburra’s [Australian men’s hockey team] are based here in Perth, the majority all have to play in the MTL [Melville Toyota League]. So, the rule is that unless they’re injured or away playing a competition they’re here so you could be playing against three Kookaburra’s every week [at community club competitions].” (Jill, parent of junior elite athlete)
Although this is likely to have benefited Perth’s broader hockey culture and the success of some athletes, it is important to acknowledge that Perth had an existing culture of hockey success prior to the inception of the AIS decentralised program (to be discussed further Chronosystem – Partition of India and migration). Furthermore, as Study 1 demonstrated, the 2012 Olympics was the first since 1992 a known “hotspot” Olympian represented at the Games in hockey. Accordingly, this may demonstrate although having the AIS hockey program in Perth may have positively influenced the local hockey scene, its presence alone has not guaranteed success.

“In 1984, the AIS decentralised program was established here because this is where all of the best facilities were. We had [Australia’s] first synthetic pitch and a local hockey culture. It’s not like that now, but a chunk of the players were coming from Western Australia (WA). WA still provides its share but most of the players now are coming from Queensland and New South Wales.” (Ray, Hockey)

Overall, it appears the AIS hockey program has had a degree of influence in athlete development and local hockey success across broader Perth with positive outcomes for some “hotspot” athlete’s. Given the timing of the program’s inception in many “hotspot” Olympians lifespan however and the twenty year gap in Olympic “hotspot” representations in this sport, it is difficult to determine if the presence of the AIS decentralised program had a strong influence on many Olympians’ early athletic development.

6.2.7 Western Australia (WA)

Overall, the isolation of Perth and WA compared to other Australian capital cities, was believed to be advantageous for athlete development in several ways. From a practical perspective, having a relatively small population and low levels of traffic compared to other Australian capital cities was considered to enable Perth athletes to have easier access to facilities for training and competition. Accordingly, this led to some perceptions these features may have resulted in increased recovery time, consistency in quality training and ultimately enhanced performance for “hotspot” and West Australian athletes.

“The geographic ability to get around the city and train is actually a lot easier than in other states…it’s just a bit more rural which makes it a bit easy to access…it’s definitely more time efficient. So you train more, you recover better, get back to the next session and I think that helps.” (Roger, elite rowing coach)

Additionally, some Olympians’ and members of the community felt this small population also enabled talented athletes to stand out from a young age, which enhanced confidence and opportunities for being talent-spotted.
“...because you’re also not having to deal with population, you are getting more of a chance of actually being able to go and try out for a team and be successful in getting in. A relatively small population means clubs have vacancies and therefore maximum exposure.” (Sue, parent of junior elite athlete)

“...having the relatively small numbers and the isolation makes it possible to be a big fish in a little pond pretty easily. I think that drives a lot of people because you do get recognition and with that comes confidence.” (Monica, Gymnastics)

This reasoning demonstrates correlation to the ideals of the ‘big fish, little pond’ effect (Marsh, 1987) and the concept that smaller communities can provide youth athletes with enhanced levels of confidence, competence and character, which can sustain long-term sports involvement (Côté & Erickson, 2016). Partially, this is due to their potential in providing developmental and psychological benefits, such as easier accessibility to open space, facilities, coaching, helpful relationships and a sense of belonging (Côté & Erickson, 2016; Horton, 2012; Oakley, 2014). Accordingly, this may result in greater attention being given to developing athlete’s from a young age (MacDonald, King, et al., 2009) and provide opportunities for earlier talent identification; potentially resulting in a ‘virtuous circle’, where young athletes have the motivation and confidence to progress (Horton, 2012; Oakley, 2014).

Furthermore, this isolation was believed to have contributed to the development of a unique Western Australian pride, culture, identity and sense of community support. It was considered that “everybody knew everybody”, which developed a “family mentality” and stronger community relationships. Rhyse believed this helped create a supportive environment for his athletic development and recalled never being shy about asking for help to improve.

“I think it’s probably part of the culture and mentality if you’re from Perth you kind of band together...a big cultural difference is that they do take care of each other...it was probably a good community spirit... I think isolation is one of the best things that Perth has... there are definitely some cultural things and I definitely think that they are more open and accepting. I never had that fear of asking.” (Rhyse, Canoe/Kayak)

These close relationships not only led to additional advice and support for young athletes, but exposure to elite sporting role models from a young age. This enabled athlete’s to see the Olympians who came before them were “not superhuman, just normal everyday people” (Jenny). Relatively small participation numbers in some sports like Athletics, resulted
in juniors and seniors regularly competing together, which was considered atypical in larger Australian cities.

“...you might have four or five different centres in [other capital cities] happening on any one weekend. We’ve [always had] just have the one. So it’s where everybody is- it does expose younger athletes to the elites. And it normalises it, too. It’s not something out of the ordinary. They’re just people that are there, competing day in, day out. And you’re competing against them too.” (Jenny, Athletics)

Similar factors were found to be present within Balish and Côté’s (2014) case study of a successful Canadian sporting community. Talented youth athletes were often given opportunities for mixed-age practice and competition and proximal exposure to role modelling from more experienced athletes. Fundamentally, this was beneficial for athletic development, as it enabled athletes to engage in activities that would be beyond their reach in an age-segregated environment. Ultimately, despite its potential disadvantages, WA’s isolation appears to have produced several potential benefits for “hotspot” Olympians’ athletic development.

6.2.6.8 Broader political influences in WA

6.2.6.8.1 Daylight Saving

Unlike many other parts of Australia, WA, Queensland and the Northern Territory do not experience Daylight Saving during summer months. Several studies in Australia and overseas have long argued its perceived benefits and disadvantages. At best, Daylight Saving has been suggested as a potential public health intervention due to causal links existing between daily PA and hours of sunshine (Aggio et al., 2015; Beighle et al., 2012; Goodman et al., 2014). Other research however contradicts these findings, through claiming Daylight Saving is not likely to encourage greater participation in MVPA at various times of the year (Zick, 2014).

Overall, Olympians’ and community opinions on this variable were indecisive or uncertain in terms of its implications for sports and PA involvement in Perth. Most commonly, the absence of Daylight Saving was deemed beneficial, which aligns with the majority view of WA residents during the last daylight saving referendum (Western Australian Electoral Commission, 2016). Reasoning for this viewpoint often aligned with Perth’s character as a morning city, with many suggesting Perth’s most stable and desirable weather was in the morning. This was particularly considered to be the case during summer months, when the windy afternoon influence of the Fremantle Doctor was present (Williams et al., 2012). It was felt people were no more likely to engage in evening PA during daylight saving trial periods.
and water sports had a particular advantage by training early in the morning with both sunlight and stable weather.

“I do believe that for water sports...for the early morning sports it has been an advantage not to have Daylight Saving...if you had Daylight Saving you’d literally be getting on the water in the dark.” (Andrea, Canoe/Kayak)

“In the last few years I really understand more now why it’s [Daylight Saving] unnecessary in Perth. Perth is one of the windiest cities in the world and the wind comes in the afternoon. It’s glorious in the morning and people do a lot of exercise....a lot of sports like swimming, cycling, even team sports like hockey is done in the morning. So the fact that there’s been no Daylight Saving...I wouldn't say it would be huge but it's potentially been something that could have an indirect impact.” (Mitchell, club committee member)

These views align with previously discussed knowledge more than half (5/8) of Olympic sports represented by the “hotspot” have been water sports, which may be partially, and plausibly, contributable to a lack of Daylight Saving in Perth. Study 1 also determined Perth is known to have the highest average annual number of sunlight hours compared to other Australian capital cities (Bureau of Meteorology, 2014), with a daily mean of 8.8 hours compared to 7.5 hours nationally. Ultimately, this may suggest the higher number of naturally occurring daylight hours in Perth and an absence of Daylight Saving, may have had some degree of indirect, positive influence on sport, PA and athlete development within the “hotspot”.

6.2.6.8.2 Restricted shopping hours

Similar to daylight saving, Perth’s traditionally restricted shopping hours have been distinct from other areas of Australia. Olympians’ and the community were equally indecisive as to the potential of this variable to influence PA and sport trends. Some individuals believed limited weekend trading hours had been advantageous, particularly for teenagers, families and community clubs. If shops were not open, it was considered this might encourage families to spend more time outdoors being physically active or involved with community clubs, due to few other leisure options. Additionally, teenagers may be more likely to commit to their sport, rather than work or socialise at shopping centres with friends.

“I think you still make time for that if that’s important to you, so I don’t think it’s an excuse not to be active. But maybe the shopping hours, because you don’t have that option all the time, so rather than being at the shops or being here or being there, you’re at home and you are being active and playing sport if that’s what you do in your general environment, so that might have an impact.” (Felicity, Hockey)
“Well, the shops are doing something aren’t they? Otherwise, you’re most likely doing sport or something active with your family” (Roger, elite rowing coach)

These views correlate with propaganda opposed to weekend trading prior to WA’s 2005 referendum on trading hours (Western Australian Electoral Commission, 2005). They do however, somewhat contradict Study 1 descriptive demographic data, which demonstrated youth employment rates (15-24 years) within the “hotspot” (52.9%) are not much lower than nationally reported figures (53.7%). In fact, greater Perth which has traditionally shared the same restricted shopping hours as the “hotspot”, has high reported youth employment figures (58.6%) when considered in relation to overall Australian rates. This may suggest shopping hours and opportunities to work are not strongly influential on youth athletic development.

Alternatively, Andrea considered restricted shopping hours may not have influenced youth involvement in sport and PA within the “hotspot”, purely because the area traditionally lacked malls that were considered attractive places for teenagers to socialise. Accordingly, they were more likely to fill their time with other recreational pursuits beyond socialising in public places.

“…there’s the Grove, but that’s small, and it’s never been big or popular -- my grandmother shopped there. So not so much restricted shopping hours, as the fact that the malls just don’t exist.”

Most commonly however, “hotspot” residents were uncertain about the influence restricted shopping hours was likely to have on PA and sport participation. They considered there may only be a weak correlation and people were likely to continue being involved in these activities if it was part of their lifestyle or important to them, regardless of shopping hours.

“I mean you know I wouldn’t say it would be a massive thing, but it could be a definite part of it.” (Mitchell, cub committee member)

“It would be hard to judge on that. It [shopping] wasn’t a big part of what I did, so I guess you would spend more time doing it [sport/PA]. But, yeah I’m not really sure.” (Alex, senior elite athlete)
Overall, although views on restricted shopping hours and its relationship with sport remain inconclusive, the lack of shopping malls and shortened opening hours may have unintentionally provided some degree of indirect benefit for grassroots sport participation and athlete development within the “hotspot”; this may be generation-specific. Each of the participant viewpoints provided are credible, given access to shopping malls, part-time work and cinemas have all been found to be barriers to sports participation amongst youth in larger Australian cities (Craike et al., 2011).

6.2.6.8.3 School system in WA

In the expression of their views of the “hotspot”, a small number of Olympians’ and the community raised notions of WA’s school system potentially being a factor with indirect implications for athlete development. Known as the “$1 swimming lessons”, the long-running schools swimming program, which takes place during school term and holidays, was most commonly discussed as influential in relation to this theme.

“Primary school kids all do swimming. There’s been a program that’s been running since well before I was at primary school where in term one and four they will do swimming every day for two weeks. There is also been a heavily subsidized Vac [vacation] swimming program…pretty much costs a dollar [per lesson]…and a lot of the high schools that were built in the ’50s, ’60s, quite a few, the bigger ones have some pools.” (Jenny, Athletics)

“…every school kid had 10 free lessons…so with schools you had lessons in term and then there’s vacation swimming where the government would put on swimming lessons that were free actually…the vacation swimming still operates it’s not quite free but it’s pretty darn cheap it’s probably a dollar or less.” (Brian, elite swimming coach)

Since 1919, VacSwim has provided all Western Australian’s aged between five and 17 years the opportunity to participate in quality swimming and water safety programs (Department of Education, 2016), with these programs being heavily subsidised by the government and financially accessible to the broader population. Combined with unusually high numbers of school swimming pools in Perth, alongside close proximity to beaches and the river, these factors may have ingrained a culture and skilled aptitude for water-based sports within Perth’s residents. This may have influenced the majority (5/8) of “hotspot” Olympic sports being water-based and resulted in swimming being the sport with the highest output of “hotspot” Olympic representations. Given the dearth of swimmers able to be recruited for this study however, the implications of the VacSwim program for their athlete development cannot be ascertained.
6.2.7 Macrosystem

*Macrosystem* factors exert the most distal influence on the developing individual and relates to the broader cultural patterns and belief systems of the society in which an individual exists (Bronfenbrenner, 1979b). Within this study, the role of the Olympics and sport in Australian national identity was explored.

6.2.7.1 Role of the Olympics and sport in the Australian national identity

The “hotspot” community provided unanimous views the Olympics and sport in general, were integral to Australia’s national identity, lifestyle and culture. Australians were considered to “*love their sport*” and there was belief it was something that everyone could “*talk about at the office*”, due to it being a “*core value*”. This aligns with the role of sport in Australia’s modern history, where it has played an integral role in shaping the nation’s identity, ethos and sense of community as a whole (Ferguson, 2006; Stoddart, 1988). Olympians’ especially, considered the Olympic Games were a significant source of national pride and identity for Australia as a nation.

Troy suggested this is due to sport living in the “*DNA*” of Australians and as a small population of “*underdogs*”, the Olympics provides a place where “we can put our chest out and beat it very hard”, making reference to Australia’s 4th place on the medal tally at the Sydney 2000 Games. Placing fourth in the gold medal tally behind highly populous countries like the United States (293 million), China (1.3 billion) and Russia (149 million) at Sydney and then Athens (2004), was an illustrious achievement for a small nation of 20 million familiar with punching above its weight on the international sports scene (Coates, 2008). The Olympians themselves viewed the Games as something special – a milestone life event and an adopted aspect of their identity, which validated years of hard work. In recalling a quote she had heard when younger, Lara exemplified the high value placed on being an Olympian:

"You can be an ex-footballer, you can be an ex-wife, you can never be an ex-Olympian"

So great is this value in Australian society, that several Olympians recalled an awareness of the Games in early childhood, which is often when their aspirations were founded to one day wear the “*green and gold*” for Australia. This is not surprising given the Games are deeply embedded into the Australian psyche. The Olympics have produced a greater proportion of national sporting heroes than any one sport (Cashman, 2002), with even international media sources known to label Australia as the most sports-minded country ever (Campbell, 2015).
“…[the] Olympics for me was everything, the Olympics was the best time in the universe, when the Olympics was on I was in heaven. I remember just being glued to the TV and making mum buy me a yellow shirt and green shorts…I would just walk around like that everywhere…that was influential for me, when I was young that was my life goal” (David, Athletics)

Partly, these aspirations were embedded in the awareness of the prestige, status and responsibility that came with being an Olympian in Australian society. Both the community and athletes agreed with the notion of high-regard bestowed upon the nation’s Olympians which, in many cases, originated through their presence as role models and everyday Australian’s who achieved great things. This aligns with Australian sporting history whereby many of the nation’s greatest Olympians became household names due to their relatability as many were ‘battlers’ from the bush or from the working classes and/or migrant backgrounds (Gordon, 2008).

“I think Olympic champions are always highly regarded in our culture. They get all sorts of rewards, not just through acknowledgment of their sporting success, but you often seem them in television commercials…and in Australia Day honours. I certainly feel some of that responsibility in terms of if you did something wrong, or you mess up…it’s a long way to fall.” (Monica, Gymnastics)

“…they are your role models…when they [Australian’s] see the story that’s associated with the Olympic champions they can see that they’re just normal people…they’re no more special than anybody else…they have a pulse.” (Loretta, elite athletics coach)

“…making the Australian Olympic team is very highly regarded…I think that has really transpired right through our sporting history…if you are an Olympian you are held in a special regard…there’s always a strong feeling of forgiveness if Olympians do make mistakes in whatever walk of life they’re in, they’re more readily forgiven than if is it’s a Bill Blogs or a footballer… I think that Olympians do have a special status.” (Brian, elite swimming coach)

Despite the highly esteemed nature of Olympians, some athletes and the community were equally likely to express views that the Games may no longer be valued as highly as in previous eras. Predominantly, this was due to increased exposure and media attention provided to professional and non-traditional sports year-round. The proliferation of AFL [Australian Football], especially in WA, was deemed to be popular and influential for young males, due to exposure to a different type of sporting hero often associated with fame and fortune. Comparatively, the Olympics only arise in the national consciousness once every
four years and were not considered as glamorous or alluring to a new generation of youth sport participants who have a greater diversity of options.

“Unfortunately, it’s having less of a role. It used to have a really strong role for four years. Now we have an interest six months before and then four months after where you probably bag [criticise] the Olympians. Whereas before, and this was early my era, people were a lot more supportive of Olympians.” (Sonya, Hockey)

“…they [AFL players] make a lot of money and they’re living the rock star lifestyle. We didn’t live a rock star lifestyle that footballers do; it’s a great life, but even when you’re doing well…it wasn’t like we had girls throwing themselves at us.” (David, Athletics)

“Once every four years, it’s out there. All the other time, it’s like AFL or cricket. So that’s really frustrating being an Olympic sport and knowing that you only get recognised basically once every four years…every other time, it’s kind of shoved to the side because of AFL, which is very week, or cricket which is every summer.” (Lucy, Gymnastics)

“I think it’s in serious trouble as a cultural icon because of the changing nature of people’s recreation. People will watch it on TV, but are they engaged with those Olympic sports? Not necessarily, I don’t think so. And you look at the biggest sports in Australia…AFL and cricket are not Olympic sports. Kids have got many more options now…they can go to the skateboard park, they can go surfing. Traditional sports are the ones who are going to miss out because they’re not sexy.” (Paul, club committee member).

In this light, it was surmised by both community and Olympians such factors may result in smaller grassroots participation in traditional sports in the future, which could influence Australia’s ability to produce a diversity of Olympians’ in future generations. Ultimately however, the prestige associated with Olympic sport and the opportunity to represent Australia amongst the best in the world, was deemed to be a pinnacle achievement and motivating factor for many “hotspot” Olympians’.
6.2.8 Chronosystem

Cutting across each of the other systems (micro, meso, exo and macro), the chronosystem represents time and is often viewed in terms of key events in the developing individual's life, or their encounters with the macrosystem or historical events at a particular age (Wachs, 2015).

6.2.8.1 Key historical events

6.2.8.1.1 Sporting events

In the last fifty years, Perth has hosted several significant international sporting events, including the 1962 Empire (Commonwealth) Games, 1987 America’s Cup and two World Aquatics Championships (1991 and 1998). These events with their key facilities, were held within the “hotspot” and nearby areas (Kennewell & Shaw, 2007). Older members of the community and Olympians considered this to be influential for children and athlete’s growing up within the “hotspot”. Not only were these events considered to enhance exposure to elite and international level sport, but brought modern, world-class facilities to Perth, particularly in relation to the Empire Games. Prior to this event, Perth had been a small, geographically isolated town, unknown in other places around the world. Due to the Games, Perth accumulated modern sporting facilities ahead of most other Australian cities (aside from Melbourne following the 1956 Olympic Games) that may not have otherwise been developed for another decade (Gregory, 2003). Accordingly, Perth was ahead of its time and this built excitement around international sport. Ray reminisced on the excitement of being a local child during these Empire Games:

“I was a 10 year old and I remember seeing the Queen and the Duke of Edinburgh drive past, ‘cos the lawn bowls was in the Commonwealth Games and that was held at the Dalkeith Bowling Club. I remember how exciting it was that it was happening …going to the stadium and watching athletics was really terrific excitement…it was like this is a world event and it’s here in the backyard you know!” (Ray, Hockey)

This ‘buzz’ was still felt several years after the Games, with local children in following generations having strong awareness of the Olympics and international sport from a young age, due to the proximity to facilities such as the Perry Lakes Athletic stadium and the presence of the City Beach Games Village, which later became residential (Gregory, 2003; Shaw & Stickells, 2010).
“So City Beach, all of the houses were the Empire Games village…all of my friends and all of the kids that went to [primary school], all living in Games village houses…and it's not just the facilities, it's the brand of what it represented, it was the buzz and excitement of it being from those events. [So] we knew about the Olympics before we probably should have known about the Olympics.” (Sonya, Hockey)

Accordingly, such factors were considered to have potentially enhanced sports and PA participation rates due to the excitement and access to facilities they brought.

“...as soon as you start getting Olympic [elite] level exposure, you start getting that increased awareness and therefore participation comes from that.” (Joe, community development officer)

Potentially, the excitement and awareness of elite sport that arose from these events may have contributed to a largely debated ‘trickle-down effect’ in grassroots sports participation within the “hotspot”. Researchers and the IOC have long speculated this factor may be a legacy for cities and countries hosting major international sporting events (Frawley & Cush, 2011; Girginov & Hills, 2008; Hindson, Gidlow, & Peebles, 1994). Children and young people are believed to be amongst those most influenced by this effect (Wicker & Sotiriadou, 2013), with some evidence for this occurring following the 1992 Barcelona and Sydney 2000 Olympic Games (International Olympic Committee, 2012; Veal, Toohey, & Frawley, 2012). The exact extent to which this ‘trickle-down’ effect may have influenced developing athletes within the “hotspot” across several generations, is difficult to determine.

6.2.8.1.2 Partition of India and migration

Olympians who had competed in hockey and members of its sporting community, suggested the Partition of India (into the countries of India and Pakistan in 1947) and subsequent migration patterns, had influenced the successful hockey culture within the “hotspot” and Perth, more broadly. As history advises, this event saw many sports-loving Anglo-Indians migrate to Perth in the late 1940’s-early 1950’s (Moore, 1996). This Anglo-Indian influence on playing style, alongside Perth’s traditionally strong network of hockey clubs and desirable winter weather, had likely contributed to the prominence of West Australians in Australian hockey teams for many years (Gordon, 1994). Subsequently, this led to a ‘snowballing’ of success for this Olympic sport within WA and was likely a contributing factor to the Australian Institute of Sport’s (AIS) decentralised hockey program being based in Perth; this brought with it several benefits including strengthening of local competition and clubs. Ray provided an overview of this history:
“WA got a boost in the 50’s after the Partition in India because the leaders in hockey for the first part of the last century were Indians and after the Partition, lots of Anglo-Indians in particular left…they got in boats, came to Australia and the first place they landed - Perth. So Perth got this infusion in the 50’s, from the sub-continent which had a dramatic effect on the local scene. A lot of the players who played for Australia in the 50’s and 60’s had that Anglo-Indian background. That's when they started to do really well and win medals at the Olympics…it started to snowball. Then there was the [AIS] Centre of Excellence…WA had the best pitches in the country and the best weather in the winter, so that suited the game…so this little enclave was established and Western Australia won every national championship in women's hockey for nearly 20, 30 or 40 years there and in the men's we won 90% of them. People who got in the Australian team went overseas, saw what was there and brought it back to Western Australia and we are a fair way away from the East, so it was a little enclave if you like…so that underpinned it. In 1984, the AIS de-centralised program was established here because this is where all of the best facilities were. We had the first synthetic pitch and a local hockey culture.” (Ray, Hockey)

“I think hockey in WA changed its whole way of playing in the late 50s, early 60s and the key part of that is what's called the Anglo-Indian influence. We had a huge number of Indian migrations, all coming to WA more than anywhere…then we have this Indian influence with these five brothers who played for Australia, the Pearce Brothers…and with the WA influence, Australian hockey changed. Suddenly, all of the players were Western Australian, because we played this different style…we had the best competition and then they brought the AIS…so now the whole of hockey is focused in WA.” (Darren, coach of junior elite athletes)

Ultimately, the correlation between history, Olympians’ and community perceptions highlights the perceived input of the Anglo-Indian influence on Perth’s broader hockey community, despite occurring decades prior to 1984-2012. Indirectly, this is likely to have had a 'snowball'-effect type influence on athlete development for hockey Olympians in Perth and the “hotspot”.

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6.2.9 Chance, happenstance and other circumstantial factors

Although comprehensive, Bronfenbrenner’s (1979b) EST cannot account for all factors directly or indirectly influencing the athletic development of “hotspot” Olympians. As a unique variable, chance does not fit neatly within this framework. Gagne’ (2009) recognises that chance factors, such as favourable genetics, birth place, SES, environment and unforeseen events, can have a significant influence on human development. Chance factors have been found attributable to athlete development in other retrospective and youth-focused studies (Gulbin et al., 2010; Mills, Butt, Maynard, & Harwood, 2012).

6.2.9.1 Climate and geographic good fortune

Olympians’ and the community held a general consensus Perth had an ideal climate encompassing plentiful sunshine, mild winters alongside low rainfall and humidity which is not surprising given Perth is known for its Mediterranean-like climate (Department of State Development, 2011). This was considered geographically fortuitous and conducive to PA and sports participation. Such influences were considered advantageous compared to other parts of Australia, as winters were not so cold they discouraged PA, whilst the afternoon coastal breezes known as the ‘Fremantle Doctor’ made exercise bearable in summer months.

“It's dry…it’s never humid like Sydney is…and Brisbane, its worse. Perth in my opinion and I’ve been to a lot of places, but Perth has the best climate of anywhere. We train right through winter…it rains sometimes, but you get blue skies right through. In terms of an outdoor training environment for outdoor sports like ours, there’s nothing better…the weather is terrific." (Ray, Hockey)

“I think we’re so fortunate with all the sunshine that we have. I know when it’s in the middle of winter…you want to stay in bed in the morning for a bit later…that is such a short period of time and the rest of the time you just want to be outside and go for a walk and be active and playing some kind of sport.” (Felicity, Hockey)

“It sounds flippant but you know the weather being how it is encourages people to be outdoors and playing sport.” (Mitchell, club committee member)

“It makes it easier if it's not as humid. You don't get as tired and you don't have to stop as much.” (Jesse, junior elite athlete)

“Well, we do get a sea-breeze especially here on the coast, it normally comes in around mid-day so even if you get a hot day in the morning the breeze comes in and it's reasonable later on in the day to still do things.” (Todd, club committee member)
These views align with Study 1 climate data, which demonstrated a temperate climate conducive to sport and outdoor recreation across several variables. The comments regarding low humidity particularly, and its benefits for training correlate with Study 1 data, which determined Perth was Australia’s least humid capital city when both morning and afternoon measures were included. Furthermore, prior research has demonstrated, that locations with stable, temperate climates and dry-moderate conditions are less likely to experience fluctuations in PA behaviours due to seasonal change (Badland et al., 2011; Merrill et al., 2005). This is because elevated temperatures and humidity have been demonstrated to adversely influence athletes and decrease athletic performance compared to other cooler conditions (Sunderland & Nevill, 2005; Zhao et al., 2015). Unsurprisingly, an Australian study found residents in Perth were likely to be significantly more active than other capital cities, in part due to climatic differences (Bauman et al., 2012).

Aside from the climate’s perceived benefits for athlete development, some Olympians believed Perth’s geographic locality on a coastal sand plain (Wilson, 2012) was also advantageous. This foundation made for ideal grass-based hockey fields and athletics tracks, particularly prior to the increase of synthetic surfaces in recent years. Olympians’ believed this reduced their risk of injury and potentially lengthened their careers, alongside being advantageous in wet conditions due to quick drainage, which resulted in minimal disruption to training and competition.

“There’s the geographical advantage of being on a sand plain, so when it rains we’re not playing in mud, we’re playing on nice flat pitches and all of that. The grass fields are much better than anywhere else.” (Ray, Hockey)

“…we would have to have the best grass tracks in Australia…whereas other places that don’t have that sort of facility…they’ve got mud and clay. [It has] much better drainage…it’s sandy so it [rain] just drains away.” (Jenny, Athletics)

These views are supported by research, which has suggested natural sand-based surfaces in sport can limit muscle damage, soreness and decreases in performance capacity, due to their low impact (Binnie et al., 2014). Comparatively, artificial surfaces can cause greater muscle soreness, injury and longer recovery time (Drakos et al., 2013; Williams et al., 2016). Geography and climate were considered integral to water-sports also, with Rhyse considering himself fortunate to have begun his canoe/kayak career outside of a drought period with high rainfall and river levels. He believed differing weather patterns could have hampered his early skill development.
“I think the other thing for me was in the ‘90’s there’s rainfall...during drought there’s no rainfall. If we didn’t have rainfall we probably would struggle...that one river, one winter used to be up to one or two and half meters and now I look at the rain gauge and it’s like point five metres...now, it’s a big difference” (Rhys, Canoe/Kayak)

Some coaches however, considered climate factors such as the ‘Fremantle Doctor’ to be disadvantageous and disruptive to training. The location of rowing courses at some private schools made afternoon training challenging, alike the old, poorly positioned Empire Games stadium (demolished in 2012) which made afternoon training sessions difficult due to the wind.

“Environmentally, it’s challenging the water way because of the wind in summer, but the temperature is good you can train in it, long days...Christchurch and Scotch [private school’s] is not a great spot for summer...you get a lot of breezes and quite often they have trouble even getting out of the water.” (Roger, elite rowing coach)

“People say to me, ‘Aren’t you sad, Perry Lakes [stadium] is gone.’ ‘No, I ran into that wind for 20 years and it wasn’t pleasant.’...it was bad [positioning]. They built it so the sun wouldn’t get into the Queen’s eyes.” (Loretta, elite athletics coach)

Interestingly, several “hotspot” Olympians who competed in rowing and athletics had trained at these facilities. This may suggest the perceived disadvantage of training into the wind, may have inadvertently served as an advantage. Potentially, this may have enabled a type of resistance training to take place and prepare athletes for difficult competition environments elsewhere and also enhanced overall athlete development. These reflections may confirm that sport-environment relationships are multi-faceted, particularly for outdoor sports (Peiser & Reilly, 2004), which may require ideal weather, environment and geographic conditions before they can take place (Bale, 2003) or provide benefits for training and competition.
6.2.9.2 Exposure to sporting opportunities

Certain Olympians felt as though exposure to their Olympic sport, coaching and expert knowledge they locally received came down to chance. In some cases this involved being present at training on a day when a key selector from WAIS was there, or becoming involved in their sport at a time when it was locally strong compared to other eras.

“... if you went to [name] canoe club about five years after me it was dead...you would have struggled because you would have gone to the club and there wouldn't have been any juniors my age...but for the ten years I came through there was a good crew... I think I was just lucky that I came out in that group. I was actually really lucky that I showed a bit of promise when I was younger.” (Rhyse, Canoe/Kayak)

On a similar note, Andrea recalled beginning her involvement with kayaking through boats locally provided by the company Uncle Toby’s, which coincided with the inception of the WAIS canoe/kayak program. She began the sport to support her younger sisters Olympic ambitions and keep her company at training.

“I think that it actually all came about because when Clint Robinson had won his gold medal in 1992, he was sponsored by Uncle Toby’s...they bought a trailer full of boats for each state. Whereas resources had been really scarce in the past they now had a trailer of boats...I was going to go paddling with her [sister] anyway. She was 14, I wasn't just going to send her off on her own...[otherwise] probably I would never have taken a boat.” (Andrea, Canoe/Kayak)

Such experiences are not dissimilar to other experiences highlighted by Oakley (2014), where several British Olympic champions began initial involvement in their sport through chance and convenient access to a key resource needed to excel in their sport. These encounters then often led to contact with enthusiastic and influential local coaches, clubs and elite training groups. This demonstrates how a confluence of unlikely and auspicious variables, encompassing access to facilities and broader social milieu can influence a talent “hotspot”.
6.2.9.3 A series of planned and fortuitous factors coming together

Overall, Olympians’ and the community believed it was evident the success of the "hotspot" is attributable to a confluence of planned and fortuitous factors. Each had difficulty with identifying the development of the “hotspot” as attributable to any one causal factor and suggested it was due to several influences, including the history, climate and geography of the “hotspot” and the broader Perth area, entourage influences, access to facilities and other personal factors.

“It's a node of quality and excellence and good coaching and whatever…this is an informal thing that has just sort of happened…there were role models everywhere, the facilities were good and there was an expectation. I mean, I think we were fortunate.” (Ray, Hockey)

“…I think luck and circumstance has a lot to do with it…it's a case of recognising what you've got and building on it. If you've got a strength there, then support it…that's what we have.“ (Mayor A)

“...if someone is talented in this area then they can go wherever they want because there’s a good level of competition, facilities, coaches…so if they've got the talent they can be nurtured and developed. In another area, if someone’s got the talent they just may just have none of those things” (Mayor B)

Several Olympians considered aspects of chance as significant to their careers. On more than one occasion, they described being ‘lucky’, ‘fortunate’ and ‘in the right place at the right time’ with some even believing that they would not have Olympians had they not grown up within the “hotspot”.

“I feel really lucky in that sense and I feel like it wouldn't have happened if I did pole-vault in another place, it wouldn't have happened unless I was in Perth…I can't say that I could have got as lucky with the coach I had…with the coaching I had and the timing of everything, so I do feel like definitely I was lucky, I was put in the right place at the right time.” (David, Athletics)

“I know that if I hadn’t grown up in Perth, I wouldn't have made it to the Olympics. I know that…it certainly made me think, there’s a lot of luck involved. Coming from a family who had the resources to provide, that I just happened to be at the gym when Lisa came through…. It could have been someone else, I could have not gone to the gym that day…maybe she wouldn't have seen me… it’s so serendipitous. I often think about that; I feel really lucky… I think it’s a bit of being in the right place at the right time… But how did I get lucky enough?" (Monica, Gymnastics)
“... I often think, too, in a lot of ways I was really lucky that I ran really, really well and didn’t have any injuries in an Olympic year and I made the Olympic team...there is a certain amount of chance...a certain amount of luck that the year that you really shine and do well becomes an Olympic year.” (Jenny, Athletics)

“...that’s probably the case that with any story of any kind of success - it’s just a set of events that work in your favour” (Andrea, Canoe/Kayak)

These outcomes correlate with prior research suggesting “hotspots” have a tendency to flourish without warning (Coyle, 2009) and talent can emerge from countless developmental circumstances in the unlikeliest of places (Gulbin & Weissensteiner, 2013). Several environmental factors identified as contributing to the “hotspot” including geography, town size, access to facilities, families, schools, communities and local sports culture have also been present within other talented sporting communities (Balish & Côté, 2014; Coyle, 2009; Oakley, 2014; Syed, 2010). Ultimately, the “hotspot” community and its Olympians did not believe unique measures had consciously been undertaken to develop a proportionately large cohort of 1984-2012 summer Olympic representations. Rather, they believed it was about the community making the most of what they already had and capitalising upon it, which, in turn, led to the development of a breeding ground conducive to successful athletic talent development.
6.3 Conclusion

Using semi-structured interviews built around the framework of Bronfenbrenner’s (1979b) ‘Ecological Systems Theory’, this study sought to investigate both Olympians’ and community perceptions of how an Australian sporting “hotspot” located in the affluent western suburbs of Perth, WA was created. Additionally, it aimed to determine how the “hotspot” as an early developmental environment, may have influenced the early development and subsequent success of Olympians’ whose early athletic development took place within this environment. Overall, the creation of this “hotspot” could not clearly be allocated to any one cause, although it was evident that a confluence of planned and fortuitous factors that occurred between 1984-2012 and the preceding decades, had unintentionally contributed to its occurrence.

The results determined a range of demographic, geographic, historical, social and chance factors had contributed to the creation of the “hotspot” which highlights the complexity of talent development environments and their influence upon the attainment of expertise. Ultimately, factors most proximal to Olympians including family, individual psychological characteristics and junior sports environment, were perceived to have the most decisive influence on their athletic development. For the broader athlete development and talent identification community, this can be considered a positive finding, as these factors have potential to be present within, and transferable to, other settings within Australia and beyond.
Chapter 7 – Discussion and conclusions

7.1 Introduction

As outlined previously, the key aims of this study were to:

1. Identify if and where a “hotspot” of 1984-2012 Australian summer Olympians existed, and place it in an Australian context; and
2. Investigate the influence of the “hotspot” on Olympians who experienced their early athletic development in this environment, as perceived by the Olympians themselves and the “hotspot” community.

These aims were addressed over the course of two studies, guided by the framework of Bronfenbrenner’s (1979b; 1994b; 1998) ‘Ecological Systems Theory’ (EST) and ‘Bioecological Model’ (BM). Using a mixed-methods (MM), case study approach, the two studies were able to:

1. Identify and situate the “hotspot” in an Australian context (Study 1); and
2. Record Olympians’ and community perceptions of the “hotspot”, and how it might have influenced the early athletic development of the Olympians’ (Study 2)

Collectively, these two studies sought to address the following three research questions:

1. Which Australian Local Government Areas (LGAs) comprise a “hotspot” area for 1984-2012 Australian summer Olympic representatives and how does the “hotspot” compare demographically and climatically to other Australian areas? (Study 1)

2. What are the community’s perceptions of how the “hotspot” was created and how influential do they think this early developmental environment was to the subsequent sporting success of local Olympians? (Study 2)

3. How do Australian Olympians retrospectively perceive the influence of the “hotspot” and its contribution to their early athletic development and subsequent sporting success? (Study 2)
Following the collection and analysis of early developmental environment data for all known (n=2160) 1984-2012 Australian summer Olympians, the existence of a possible “hotspot” was first of all determined, then found to be located in Perth, WA. In producing a proportionately high number of Olympic representations, several “hotspot” Olympians had competed at multiple Games with the majority (75%) producing a medal-winning or finals place as their best result at an Olympic Games (1984-2012). In total, Olympians, whose early athletic development was located within the “hotspot”, accumulated 52 known representations. These athletes (n= 32) competed at the Olympics across eight sports, more than half (n= 5) of which were water-based. They included Athletics, Canoe/kayak, Gymnastics, Hockey, Rowing, Sailing Swimming and Water polo. These factors contributed to the Cambridge, Claremont and Nedlands LGAs presenting prominently as an Australian “hotspot”.

Overall, the intent of this study was to deepen our knowledge of early developmental environment and birthplace factors, which may influence the athletic development of Olympians. This study was initially inspired by the ‘birthplace effect’ (BPE) phenomenon, which highlighted the crucial role early sporting environment can have on athletic development (Cobley et al., 2014; Turnnidge et al., 2014), due to factors such as population size and initial timing of and exposure to athletic activities (Côté et al., 2007). Most prominently, studies on the BPE have demonstrated ‘birthplace’ can influence an individual’s likelihood of reaching an elite level in sport (Bruner et al., 2011; Côté et al., 2006), with this field of study having a traditionally strong quantitative focus on North American athletes, across a range of sports settings (Baker & Logan, 2007; Baker et al., 2014; MacDonald & Baker, 2013; MacDonald, Cheung et al., 2009).

At the onset of this study, there was no known research in the English literature, which had investigated the BPE for Australian summer Olympians over a historically longitudinal period and there was little research examining the BPE amongst Olympians worldwide (Baker, Schorer, et al., 2009; LaForge-MacKenzie et al., 2015). Prior studies have often determined that small-medium communities are conducive to providing opportunities for athletic success, with populations ≤ 250,000 known to be particularly advantageous for athlete development (Côté et al., 2006; Lidor et al., 2010; Lidor et al., 2014; MacDonald, King et al., 2009; Schorer et al., 2010). There is however wide variation on a ‘medium’ or optimal city size depending on country context (Rees et al., 2016) and for this reason the likely location of an Australian “hotspot” was unclear. The findings of this study however, share similarities to other successful talent development environments.
Despite the “hotspot’s” raw population size being much smaller than in the previous overseas studies, for an Australian context the results are comparable. When observed separately, the LGAs of Cambridge, Claremont and Nedlands which comprised the “hotspot”, each had populations below 30,000 at the 2011 Census (Australian Bureau of Statistics, 2013a, 2013b, 2013c); this categorised them as Urban Developed Small (UDS) areas according to the Australian classification of local government measures (Department of Infrastructure and Regional Development, 2015). At this time, the collective “hotspot” had a population of 54,779 which according to the same area classification, is an Urban Developed Medium (UDM) area (Department of Infrastructure and Regional Development, 2015). Accordingly, it could be understood the “hotspot” was equivalent to a small-medium community within an Australian context, similar to findings regarding successful talent development environments in several prior BPE studies.

Based on this interpretation, it was not surprising to find the “hotspot” shared several favourable characteristics with other successful talent development environments, often identified as small or rural communities. Several of these will be explored within the following section of this chapter which will provide a combined discussion of Study 1 and 2 in light of the BM’s operational framework, the Process-Person-Context-Time (PPCT) model, followed by conclusions and recommendations.

7.2 Discussion of results within the framework of the ‘Bioecological Model’ (BM)

This section will present an interpretation of the results from Studies 1 and 2 within the Process-Person-Context-Time (PPCT) model which forms the operational framework of the BM. This framework was considered an appropriate lens to holistically analyse the athletic development processes of Olympians from the “hotspot”, based on a combination of climatic and demographic data alongside community and Olympians perceptions. Collectively, discussion the PPCT model in relation to this study will allow the three key research questions to be holistically addressed.

7.2.1 Process

Within the BM, proximal processes are deemed the most powerful predictor of human development and include mechanisms like ‘athletic activities’ (training and competition pertaining to sport), which have the potential to be influenced by the environment and historical period they take place, and are most effective when occurring regularly over extended periods of time (Bronfenbrenner, 2005a; Bronfenbrenner & Ceci, 1994; Bronfenbrenner & Morris, 2006). Proximal processes are most influential, when
occurring in advantaged, stable environments (Bronfenbrenner & Ceci, 1993), particularly amongst people who had developed strong emotional relationships (Bronfenbrenner, 2000, 2001; Bronfenbrenner & Morris, 2006).

In light of this study’s findings, it is evident “hotspot” Olympians experienced their early athletic development in steady environments which provided these opportunities and resources. Stable families predominantly headed by two-parents, ease of access to quality sporting facilities, supportive community clubs and coaches and a high SES community, were some of the key sources of stability and advantage within their immediate environment. Several of these variables were triangulated by descriptive demographic Census data in Study 1 (Australian Bureau of Statistics, 2013a, 2013b, 2013c), and by Olympians’ and community perceptions. Engagement in ‘athletic activities’, whilst in the presence of these factors could be interpreted as being advantageous to the athletic development of “hotspot” Olympians.

Furthermore, other perceived advantages of climate and historical factors including town planning, migration of Anglo-Indians to Perth and the hosting of key international sporting events such as the Empire (Commonwealth) Games, were all examples of broader factors, which had the ability to provide foundations to positively and indirectly influence athlete development for multiple Olympians at the community level. Although heritability could not be directly investigated within the parameters of this study, Bronfenbrenner and Ceci (1994) propose proximal processes can serve as a vehicle through which genetic potential (genotype) can be actualised into observable phenomena (phenotype).

Heritability will vary largely, with enhanced developmental functioning occurring in the presence of superior environments and processes (Bronfenbrenner & Ceci, 1993). With reference to the above findings and the adaptation of Irvin (2015) and Kempthorne’s (1957) equation previously in Figure 3.2 it could be proposed each “hotspot” Olympian possessed latent potential to become an elite athlete within their genetic code. When combined with advantageous factors and opportunities from the external “hotspot” environment, quality proximal processes and their own personal characteristics, each Olympian’s athletic genotype or potential had the opportunity to be favourably expressed. Overall, this knowledge reinforces the advantageous influence the “hotspot”, as a place for proximal processes to take place, had upon Olympians’ early development and fulfilment of athletic potential.
7.2.2 Person

Within this study, disposition characteristics and the role they played in Olympians’ development was of interest, given the association of these characteristics with temperament, motivation and persistence (Bronfenbrenner & Morris, 2006), as well as their potential to sustain proximal processes (Bronfenbrenner & Morris, 1998). Characteristics relating to motivation and persistence including resilience, perseverance, grit, drive and determination, were most commonly expressed. Unsurprisingly, possessing these traits throughout development was likely to have been central to Olympians’ ability to initiate and sustain their ‘athletic activities’. The majority of athletes experienced challenges or setbacks throughout their development, with some Olympians believing they were not as naturally gifted as some of their peers. The motivation and perseverance required to achieve their personal goals of becoming an Olympian, despite these limitations, shares similarities with the concepts of ‘grit’ (Duckworth, 2016) and ‘growth mindset’ (Dweck, 2006).

When combined with an advantaged, stable environment, it is evident such factors would prove advantageous to athletic development. These outcomes closely relate to personal resource characteristics, which although not immediately apparent, can also influence engagement in proximal processes (Bronfenbrenner & Morris, 2006; Tudge et al., 2009). Access to social and material resources like nutritious food, housing, caring parents and adequate educational opportunities (Tudge et al., 2009), are other personal resources available to individuals in an advantaged environment, which may influence development and proximal processes. Given both the high SES demographic of the “hotspot” and the families that Olympians were raised in, each of these resource characteristics was present both at the microsystem and exosystem level. Both Olympians and community stakeholders indicated that many families were able to provide material and social resources, including the opportunities to sample multiple sports and go on representative trips away from Perth, alongside supporting extended involvement in amateur sport. Relating to the broader “hotspot”, this may serve to demonstrate how individual resource characteristics can result in a collective community advantage. Many individuals within a community possessing access to valuable resource characteristics due to high SES, may be another way in which the proportionate number of athletes who experience quality proximal processes and developmental circumstances is enhanced.
7.2.3 Context

Although context holds greater prominence within the EST (Bronfenbrenner, 1979b) than the BM, it remains an important area for consideration due to the interrelation between context and proximal processes and their influence on the developing individual (Bronfenbrenner & Morris, 1998, 2006). Perceptions of themes pertaining to several context factors were shared amongst Olympians and the community, therefore, could be interpreted as key areas of the “hotspot’s” influence upon Olympians’ athletic development.

7.2.3.1 Microsystem

Olympians within the “hotspot” experienced a shared approach to sports participation and positive influences from families, schools and the wider community during their development, similar to other successful sporting communities (MacDonald, King, et al., 2009). Within the microsystem, family were considered to have the strongest influence on athlete development, particularly during youth. Provision of mental-emotional resources including a supportive home environment and strong parent role modelling of familial values were considered crucial to positive development (Csikszentmihalyi et al., 1993; Fraser-Thomas et al., 2013; Oakley, 2014). In multiple cases, this was expressed through being raised in strict, yet supportive families whereby strong values and work ethic via parent role modelling was displayed. Global high expectations were present with a sense of responsibility also encouraged from a young age.

To a lesser extent, logistical and financial resources were considered vital, although were acknowledged by Olympians’ and community as potentially disruptive to athlete development if absent. Similar to prior research, parent’s ability to make financial sacrifices to support high performance athlete development (Khalil et al., 2014; Martin, 2015) was considered to be advantageous for aspiring Olympians within a high SES community. Although extensive financial resources may not have been available to all developing athletes beyond the “hotspot”, volunteering in their child’s sport and abstaining from “pushy” parenting were familial characteristics that appeared to be present amongst prospective elite athletes and Olympians. These outcomes are perhaps not surprising given that parental pressure during early development is, by contrast, more likely to lead to youth sport dropouts (Barreiros et al., 2013; Fraser-Thomas et al., 2008).

Second to family, both local schools and community clubs were considered to positively influence athlete development. Although access to sporting facilities including swimming pools, was common in many “hotspot” schools and may have been indirectly beneficial for early play and skill development, it appears school sports culture had greater
influence. Primary schools were considered to be integral to encouraging participation in PA, promoting exposure to a range of sports and providing opportunities for physical skill development. These findings highlight the vital role of primary education settings in instilling positive attitudes and FMS skills (Hodge et al., 2012) necessary to sustain PA throughout the lifespan of the athlete, which in turn may have inadvertently and positively influenced athlete development within the “hotspot”.

Community clubs within the “hotspot” demonstrated evidence of several features common to other small and successful talent development regions. Fundamentally, positive and welcoming club environments in which enjoyment is key (Toohey et al., 2015) appeared prevalent, as did stable and non-political cultures. Traditionally, many clubs reportedly had high community spirit and rates of sports-related volunteering similar to prior research in smaller communities (Balish et al., 2016) and triangulated Study 1 results that “hotspot” residents engage in volunteering (26.1%) with greater frequency than the national average (17.8%).

Additionally, they provided knowledgeable coaches, who instilled a passion for their sport and strong skill development at the grassroots level. Olympians and community alike acknowledged the importance of quality coaches for athlete engagement and long-term development at the junior level. This supports other studies which have shown coaches are highly influential to talent development from the grassroots level (Gulbin et al., 2010) because of their ability to influence athlete motivation and performance (International Olympic Committee, 2016). Finally, access to proximal role models, alongside opportunities to train and compete with older athletes, were other key features of “hotspot” sports clubs comparable to other studies in the field (Balish & Côté, 2014; Côté et al., 2003; Côté et al., 2006; Henriksen et al., 2010b; Soberlak & Côté, 2003; Toohey et al., 2015).

7.2.3.2 Mesosystem

This study emphasised the importance of healthy parent-coach relationships at the grassroots level and in community clubs as being a key ingredient to effective athlete development. Such findings align with the IOC’s (2015a) recommendation for positive athlete development: parents should acknowledge and respect coaches’ unique role within their child-athlete’s entourage, with an emphasis on the importance of maintaining healthy boundaries in this relationship. Olympians’ experienced the most positive outcomes in their development when schools were sports-friendly and supported Olympians’ career goals (International Olympic Committee, 2015b) outside of the school setting. These positive outcomes were heightened when both schools and community clubs provided complementary support.
These findings demonstrate the potential value of forming strong school-community club relationships within the “hotspot” and other talent development environments. Given their ability to help or hinder athlete development, this type of relationship may become a recommended area for future focus in communities aiming to efficiently work with finite athlete development resources.

7.2.3.3 Exosystem

Based on Olympians’ and community views of the broader “hotspot”, it is evident that the advantages associated with existing geographic assets and insightful town planning cannot be underestimated. Ease of access to natural facilities including parks, beaches and the river, large blocks of land with spacious backyards and recreational facilities were among key opportunities provided within the “hotspot”. These features were considered attractive to families with children and promoted outdoor recreation, unstructured play, sport and PA engagement which directly or indirectly influenced sporting skill development. These opportunities were provided partly by historic and geographic good fortune, as well as ongoing planning and maintenance support from “hotspot” councils.

In the private sphere, large blocks of residential land with backyards within many suburbs were key to the “hotspot” and have traditionally been considered pertinent to Perth’s suburb design compared to other Australian capital cities (Seddon, 1972). There has been a long-standing resistance to infill within the “hotspot”, which was perceived by the community to be increasingly unique compared to other parts of Australia and Perth where backyard sizes are continually decreasing (Middle et al., 2015). Large backyards were believed to have enabled active recreation within the home environment, which in turn was considered valuable for children’s deliberate play, PA and informal sporting skill development in the company of siblings, friends and neighbours. Such findings are not merely perception, as backyards have traditionally been an important place for active recreation (Kellett, 2011) and children’s safe, unstructured play (Middle et al., 2015). Notably, greater backyard size and provision of recreational facilities in the home environment are known to be strong influencers on outdoor play and childhood PA in Australia (Spurrier et al., 2008); this could be interpreted as valuable for “hotspot” Olympians’ early, informal skill development.

An accessible built environment relating to roads and traffic, alongside a broad array of sports facilities complemented the large backyards. The established nature of “hotspot” suburbs resulted in the presence of not only facilities, but also associated sports clubs. Existence of these assets further enabled aspiring athletes from the “hotspot” to easily access sports they were best suited to and promoted sport engagement within the area due to a combination of spatial access across public and private domains. This had a positive
influence for “hotspot” Olympians as ease of access to facilities is known to be essential to the emergence of athletic expertise (Henriksen et al., 2010b; Rossing et al., 2016; Weissensteiner et al., 2009).

Furthermore, the social and physical features of the “hotspot” environment were believed to instil perceptions of safety and encourage independent mobility from a young age similar to findings in other studies (Horton, 2012; Kytta, 2002; MacDonald, King, et al., 2009). Perceived relatively low levels of traffic and safe street design in this study meant children within the “hotspot” traditionally had opportunities for independent travel for recreation purposes and accessing local sporting facilities. For children, these factors are believed to promote engagement in more non-organised sport and deliberate play throughout development (Surya et al., 2012). This may have had an indirect influence on Olympians’ childhood fitness, physical skill development and sports involvement, given communities that do not offer these opportunities in the built environment are known to discourage children’s independent mobility (Villanueva et al., 2013) and PA (Ward Thompson, 2013). Perceptions of safety were further reinforced by a strong sense of community due to the family-oriented nature of the “hotspot” and the trend of long-term residency. Incidentally, existing social capital may have reinforced this sense of community and been the ‘glue’ (Coleman, 1988; Cox, 1995) that underpinned the socially supportive aspects of the “hotspot”. This correlates with knowledge that small, successful athlete development communities are more likely to provide the presence of supportive psychosocial environments (Côté et al., 2006).

This sense of safety was in part reinforced by the “hotspot's” high SES character which was made evident by Olympians’ and community perceptions, as well as ABS descriptive Census data. Compared to the national context, the “hotspot’s” descriptive demographic features differed across several variables. Median weekly household income ($AUD 2,188), homes owned outright (58.8%), rates of non-government (private) secondary schooling (59.7%), tertiary education qualifications (59.9%) and median age (40.3 years) were all high compared to nationally reported measures; indicating a high SES and financially-stable “hotspot”. Besides the immediate socioeconomic benefits to individual families that this financial stability provided, the high SES led Olympians to be exposed to a community of high achievers from several fields, whereby success and achievement became cultural norms in the “hotspot”.
Although other exosystem factors may have been considered Perth-wide influences, they were perceived to have an impact on the “hotspot”. The Western Australian Institute of Sport (WAIS) offers facilities and programs to benefit elite athletes from across Western Australia (WA), but its locality within the “hotspot” was considered to provide additional advantages to the “hotspot”. Proximity to WAIS was believed to offer benefits relating to ease of access to training, enhanced recovery and athlete longevity within programs, due to shorter commutes. When WAIS was first set up, it formed a partnership with the University of Western Australia (UWA), which was also located within the “hotspot”; this resulted in UWA having an indirectly beneficial influence on developing athletes. The formative partnership between these organisations underpinned the high success of WAIS during its foundation years, and provided the broader “hotspot” community with access to key sporting facilities, clubs and open space through the development of the UWA Sports Park and government sporting facilities on adjacent land (The University of Western Australia, 2014). The decentralised AIS hockey program in Perth from 1984 (Pyke, 2010) strengthened the city’s existing solid hockey culture and clubs, many of which had traditionally been located within the “hotspot”. This program brought world-class athletes and coaches from around Australia, alongside accessible role models to the area. It is likely these historical and political factors at the state level were inadvertently advantageous to many aspiring athletes from the “hotspot” and enhanced their accessibility to world-class programs, opportunities and facilities.

Within a WA context, the state’s isolation and associated identity were widely thought to have trickled down to the “hotspot” with positive influence. WA’s isolation was believed to build stronger relationships, identity and support among sporting communities. This aligns with existing literature that asserts the value of ‘small ponds’ as being welcoming places, where friendships and community support can be built relatively easily compared to ‘larger ponds’ (Gladwell, 2013). Beyond pride of connection to place and a perceived strong sense of community, a potential ‘big fish, little pond’ effect (Marsh, 1987) was also considered to have instilled greater confidence in developing athletes. Some athlete’s considered being from a smaller and isolated Australian city may have enabled their talent to stand out from a young age which not only assisted with team selection, but enabled easier access for interactions with mentors and role models. In turn, this allowed them to gain knowledge which assisted their development, alongside feel greater assurance in their abilities before competing nationally or internationally in order to progress in their sport. Evidently, several of these features are similar to other research focusing on small communities which have demonstrated greater potential for team selection, talent spotting, coach attention, as well
as the ability to interact with their mentors and role models within these regions (Balish & Côté, 2014; Horton, 2012; MacDonald, King, et al., 2009; Oakley, 2014).

The influence of government policy, such as restricted shopping hours and lack of daylight saving, were deemed inconclusive regarding their actual influence on sports participation. They were however, considered as potentially advantageous, yet minor contributors to athlete development, through aiding WA athletes to commit to their sport in the traditional absence of opportunities for teenagers to work on weekends. Lack of daylight saving was thought to possibly enable this commitment for athletes requiring water for training, which was insightful, given more than half (5/8) of the known Olympic sports represented by the "hotspot" were water-based. In conjunction with the lack of daylight saving, skill development in such sports may have occurred through an ingrained culture of, and skilled aptitude for, water-based sports among Perth’s residents due to the VacSwim programs, which have provided affordable swimming lessons to generations of young West Australians since 1919 (Department of Education, 2016). This school-based opportunity was believed to promote water familiarity and indirect recruitment of youth into swimming and other water-based sports. Potentially, by increasing the depth of a skilled talent pool in water-based sports, this enabled a proportionately higher number of Olympians to develop within a Perth-based “hotspot”.

Finally, Perth’s idyllic climate in association with its sports culture was perceived to positively influence participation in sports and training outcomes within the “hotspot”. These perceptions were triangulated by Study 1 results which demonstrated that Perth is significantly different compared to the rest of Australia across several climatic variables. Perth was found to be warmer than most Australian capital cities (mean minimum 12.4°C, mean maximum 24.4°C, average 18°C), has the highest mean daily sunshine hours (8.8 hours/day), lower than Australian average annual rainfall (747.8mm) and days of rain (n=110), alongside being the nation’s least humid capital city by both morning (64.1%) and afternoon (46.7%) measures. In part, Perth’s low humidity may be due to the ‘Fremantle Doctor’, a sea breeze blowing from the south-west to counteract hot north-easterly winds especially during the summer months (Williams et al., 2012) with the city’s mean maximum daily wind gusts (43.5km/h) also above the national average.

This data supported Perth’s reputation for having a favourable Mediterranean climate and being Australia’s sunniest capital city (Department of State Development, 2011) which were factors considered beneficial for outdoor recreation, training and athlete development. Results from Studies 1 and 2 support research that participation in sport can be enhanced by having ideal weather, environment and geographic conditions in place (Bale, 1989). This
is reinforced by knowledge that stable, temperate climates like that of Perth, have a positive influence on the maintenance of PA behaviours (Badland et al., 2011) and supported Bauman et al. (2012) findings that Perth is one of Australia’s most active cities. Overall, it is evident that several exosystem level environment factors pertaining to the “hotspot”, Perth and broader WA had potential to enhance Olympians’ proximal processes.

7.2.3.4 Macrosystem

Macrosystem factors such as the role the Olympics and sport in Australia’s national identity were considered in this study and demonstrated a trickle-down effect to the “hotspot”. This is not surprising given the character of micro-, meso- and exo-systems are considered tangible manifestations of macrosystem influences (Bronfenbrenner, 1977b). Both the “hotspot” Olympians and community participants considered sport and the Olympic Games in particular, to have been historically prominent in modern Australia’s history and national pride. Being an Olympian was considered a prestigious and highly regarded achievement within Australian society and contributed to the allure of the Games as a childhood ambition for several “hotspot” Olympians. These views correlate with historical and social perspectives on the role of sport in Australia (Cashman, 2002; Ferguson, 2006; Stoddart, 1988).

Accordingly, it is evident macrosystem influences in the form of Australia’s broader cultural patterns and shared values have been expressed at a local level within the “hotspot”. Olympians’ and the community did however raise the concern that the Olympics were possibly losing their appeal to younger Australians. This was due to only being in the public conscious once every four years, as opposed to year-round awareness of professional sports and today’s youth having greater options beyond traditional sports. If macrosystem factors continue to influence the “hotspot” in years to come, there may be different sporting trends away from Olympic sports and towards those sports considered to be purely professional or non-traditional.

7.2.4 Time

Bronfenbrenner upheld views that an individual’s developmental experiences are shaped by, events occurring during the historical period of their lifespan (Bronfenbrenner, 1995, 1999). Similar to some other retrospective research, it was challenging to accurately investigate micro- and meso-time (Riggins-Caspers et al., 2003), due to the project’s inherent design; hence, macro-time became the lens of focus due to its similarity to the chronosystem. Both Olympians and the community discussed the potential influence of key sporting events held within the “hotspot” in the era of, or decades preceding the childhood of
many “hotspot” Olympians. Two world aquatic championships were hosted during the 1990’s, but the 1962 Empire (Commonwealth) Games was considered to have had the greatest impact. This was thought to be due, at least in part, to its similarity to the Olympic Games, through the presence of an athlete’s village and the provision of world-class facilities for several sports. These events brought elite international level sport to the “hotspot” alongside the excitement and legacy that came with these events.

For the Empire Games particularly, this was at a time when many other areas of Australia, aside from Melbourne following the 1956 Olympic Games, did not have access to modern, world-class sporting facilities or opportunities for local children to have exposure to and awareness of international sport. Conversion of the athlete’s village to residential housing following the Empire Games, ensured the legacy of this event lived on in the consciousness of locals and children in future decades, as did the continued use of many sports facilities located immediately within or just outside of the “hotspot”. Potentially, the “hotspot” experienced a trickle-down effect (Hindson et al., 1994) due to these macro-time events, with future Olympians benefiting from this phenomenon as children, given that young people are believed to be most influenced by this effect (Wicker & Sotiriadou, 2013).

Similarly, the Partition of India and subsequent migration of Anglo-Indians to Perth, despite having occurred several decades prior to the 1984-2012 timeframe of this study, and having commenced outside Australia, was likely to have had a degree of indirect influence on athlete development of some “hotspot” Olympians. The correlation between historical recounts of this event (Gordon, 1994; Moore, 1996) and the hockey community and Olympians’ views, reinforced the findings of Study 2. It is evident that a prevailing establishment of successful hockey clubs within the “hotspot”, combined with this chance historical event, allowed Perth’s hockey success and proportionate contribution of Olympians in this sport to ‘snowball’. The occurrence of these historic and cultural influences influencing sport-specific success within the “hotspot”, are comparable to the work of Lidor et al. (2010, 2014). Ultimately, these historical events and their subsequent influence on athlete development did not occur with intent, but rather by chance which highlights the tangible influence macro-time or chronosystem events can have on athlete development.
7.3 Implications

Adopting Bronfenbrenner’s *EST* (1979b) and *BM* (Bronfenbrenner & Ceci 1994; Bronfenbrenner & Morris, 1998) allowed for the holistic investigation of an Australian athlete talent development “hotspot”. Holistically examining the “hotspot” through these frameworks broadly allowed for several modifiable and non-modifiable factors influencing Olympians’ athletic development and subsequent success to be identified. Generally, the outcomes of this study may be of potential interest to the Olympic Movement, government departments supplying funding for elite sport and the broader athlete development and talent identification community. As Rees et al. (2016) suggest, the ongoing intensification of global competition in high performance sport has led to a greater need than ever, to invest in the sporting systems that identify and develop talented athletes. Accordingly, the role of evidence-based knowledge in identifying and developing the world’s most promising sporting talent is of increasing importance to continually produce successful outcomes associated with this high-cost investment.

This study highlighted that Olympians’ development is multi-dimensional and attributable to a range of individual and peripheral factors. Athlete’s personal characteristics, combined with the influence of their entourage and early developmental environment, were key influences, which can be conducive or deterrent to athletic development. Using an Australian “hotspot” as an example, the outcomes of this research emphasised how the complexities between country, culture and context can influence these relationships. Although several of the identified factors may be unique to the “hotspot” and Perth more broadly, there are many modifiable features potentially present within, or transferable to, talent development settings worldwide.

The findings of this research highlighted that a “hotspot” can develop organically, through communities making use of existing resources and opportunities. These outcomes are similar to other successful talent development environments both in sport and other fields (Coyle, 2009; Oakley, 2014; Syed, 2010; Tough, 2013). Broadly, these factors relate to schools, community clubs, town planning and factors pertaining to individual athletes and their families. Primary schools were a key contributor to many Olympian’s general exposure to sports participation, PA and development of fundamental movement skills (FMS), whilst community clubs and junior coaches were integral to providing positive experiences with their eventual Olympic sport. These findings emphasise the core role these community organisations have in shaping children’s pathways to sporting development.
Focusing on fun and skill development within school sports culture and through junior community coaches, has potential to retain young athletes and deepen local talent pools. In junior sports environments, sampling a broad range of sports, delayed specialisation and developing friendships and FMS, should ideally be emphasised over winning. It is proposed, that close attention to these factors in future aspiring “hotspot” environments could be enhanced by local schools and community clubs forming close partnerships. In turn, this may enable potential future elite athletes to be recruited through friendship groups in childhood and for facilities, resources and programs to be shared. These collaborative practices may then have greater likelihood of enabling athlete talent development for individual and broader communities to occur both sustainably and affordably.

Ideally, community clubs should also focus on building their social capital and infrastructure, over placing excessive emphasis on acquiring the most contemporary facilities. Although several community clubs within the “hotspot” had access to quality facilities, supportive clubs with low levels of politics, a strong culture and high volunteering rates were most valued, particularly by Olympians. Building these features in other community clubs can enhance attraction to young athletes, their families and quality coaches. Subsequently, clubs will have greater potential to retain their athletes for longer periods, which can enhance opportunities for building social capital and club loyalty. Quality club cultures drawing upon these characteristics can then increase the possibility of attracting further talented athletes and coaches to their community. In turn, these individuals will be present to serve as proximal role models for younger athletes, which can instigate the ‘snowballing’ of local success. Furthermore, developmentally appropriate opportunities to train and compete with older or co-ed athletes was a practice successfully implemented within the “hotspot”, as found in prior research (Balish & Côté, 2014; Côté et al., 2006), with recommendations for it to be encouraged more broadly. Accordingly, focusing on the grassroots enhances the prospect of allowing talent development systems to be built systematically with stable foundations for elite athlete development.

From a town planning perspective, the importance of urban green space, sizable backyards in private dwellings and ease of access to communal recreational facilities should not be underestimated. Within the “hotspot” these were key sources of opportunity and promotion for childhood and community engagement in sport and PA. This is an important factor to consider, given the changing urban landscape in which high density housing is becoming increasingly prominent across new and existing suburbs in large cities. Such changes ultimately have potentially negative implications for public health worldwide. Fewer opportunities and less accessible space for recreation may result in lower levels of deliberate play, unstructured practice and independent travel amongst children. This is an imperative
factor to take into consideration, not only for public health regarding communal PA levels in light of globally increasing obesity rates and sedentary lifestyles, but indirectly for the prospective athletic development of future generations of Olympians and other elite athletes.

Regardless of community circumstance, it is recommended that parent education through schools, community sports clubs and other public initiatives promote the importance of unstructured, outdoor play throughout childhood, particularly in today’s technologically driven world. Parents as role models for childhood PA levels (Spurrier et al., 2008) should be acknowledged, alongside the value of strong family work ethic and encouraging children’s sense of responsibility from a young age which was understood to be beneficial for many Olympians within this study. For parents whose children are involved in organised sport, behaviours more likely to lead to positive developmental outcomes for their child-athlete should be fostered. These include the benefits of parent volunteering for children and clubs, healthy boundaries in parent-coach relationships, alongside increased awareness of the advantages of early diversification and positive, not ‘pushy’ parenting in childhood sport. Providing children with supported opportunities to sample a variety of sports may allow them to learn the art of winning and losing. This may lead to the instilment of resilience and perseverance from a young age, which the majority of Olympians felt were among their most valued personal characteristics.

Beyond these factors, it cannot be denied that a strong relationship exists between SES and athletic success, both in the “hotspot” and beyond. Access to financial resources undoubtedly influences initiated and sustained engagement in sport and PA. WA’s VacSwim was a key government-funded grassroots initiative which was believed to have instilled a strong water-based skill-set in the state’s population for many generations. This highlights opportunities for PA and skill-development provided through schools or in childhood cannot be underestimated for broader athlete development and may illustrate a beneficial example of providing affordable and accessible sporting options for children at the grassroots. Consequently, equitable talent pools may be instilled within a region through broader government-funding and policy influences upon grassroots sport, regardless of demographic differences.

Although this study determined that a range of demographic, geographic, historical, social and chance factors had contributed to the creation of the “hotspot”, Olympian’s perceived that proximal factors including family, individual psychological characteristics and junior sports environment had the most decisive influence on their athletic development. In light of the Olympian’s first-hand encounters which informed these findings, the
The aforementioned implications of this study can be taken as recommendations for foundational ‘ingredients’ required for intentionally developed future community “hotspot” environments.

Ultimately, although some of these recommendations may require funding, many others are not necessarily associated with a high-cost premise and could be implemented within existing community infrastructure at the grassroots. Focusing on these practices may lead to healthier, physically active populations and indirectly generate positive outcomes for successful athlete talent development. As a smaller part of developing the worldwide ideals of the Olympic movement, the outcomes of this study may also highlight avenues for fostering Olympic development in youth, enhancing performance and widening elite sport participation, regardless of background, in partnership with ‘Sport for All’ ideals. More broadly, knowledge accumulated from this study can be used to contribute to the consideration of new avenues for talent identification measures and athlete development practices globally.

7.4 Limitations

Similar to any research, this study had its own inherent limitations. Utilising publicly available data for Study 1 created a challenge in finding the necessary biographical information for all athletes, especially those who were lesser known, or had competed at the Olympics in an era when digital media was not as prevalent. Furthermore, obtaining data in this way did not allow direct interaction with Olympians to verify their exact early developmental environment prior to identifying and visiting the Perth “hotspot”, or interviewing Olympians deemed to be from this area. At interview, Olympians from the “hotspot” were able to confirm their early developmental environment, with some clarifying they had spent part of their early developmental years (6-15) living in or attending schools and juniors sports clubs in various LGAs both within and sometimes outside the “hotspot” area. Such knowledge was not always possible to obtain from publicly available sources and highlights early developmental environments can be both dynamic and complex pertaining to athlete development. Given that official sources were used and biographical information was found for the majority of athletes, the identification of the “hotspot” area in Perth, WA is a likely representation of where a concentration of Australian Olympic talent has originated.

It is however also acknowledged that there are other potential measures of identifying a “hotspot” of Australian summer Olympians depending on the criteria utilised. This study chose to base the “hotspot” on number of summer Olympic representations compared to population size, rather than the number of individual athlete’s compared to population size. This meant that several Olympians from the “hotspot” were accounted for more than once due to their multiple Games representations. The intent of doing so was to
allow for measures of a LGA’s consistency in performance, given that Olympians competing at multiple Games had equal chance of making subsequent teams as an athlete competing for the first time.

In conjunction with these measures, the number of medallists and finalists from each LGA were also considered. Combining these judgements was used to counteract the potential for low population numbers to artificially ‘inflate’ a LGA’s status as a “hotspot” when compared to population size. Few “hotspot” Olympians went to the Games as participants only recorded as their best result, so when the high number of medallists and finalists were considered in light of proportionately large representation numbers, the high achieving nature of the “hotspot” identified it as an area warranting further interest. Potentially, a different “hotspot” may arise if some of these measures were changed, such as accounting for each Olympian only once, regardless of multiple representations.

Additionally, methods chosen to aggregate the Top 20 LGAs to identify the “hotspot”, even when they were from vastly different states and region sizes of Australia may be limiting in light of recent findings within the field. Wattie et al., (2017) found that using commonly accepted methods of aggregating national population data to test for birthplace effects can often fail to acknowledge variations that may exist between national regions. Furthermore, use of these methods may increase potential to cause complication in measuring birthplace effects in ecologically valid or accurate ways, which in turn may have important implications for the generalisability of these effects in a national context. With consideration to Wattie et al’s (2017) recommendations however, this study contained a number of strengths due to its ability to extend beyond mere population size when investigating potential birthplace effects among a cohort of 1984-2012 Australian summer Olympians. The identified “hotspot” was investigated through use of an in-depth case study analysis and qualitative methods to build greater understanding of causal factors that influence athlete development, including socio-cultural and environmental characteristics; something that is increasingly being recommended in birthplace effect literature.

The collection of archival secondary data pertaining to demographic and climate variables was another aspect of this study that provided some limitations, particularly regarding the former. Originally, the intention of this data collection phase was to record information for “hotspot” demographic and climate variables for the 1967-2002 period encompassing 90% of identified 1984-2012 “hotspot” Olympians’ early development years (ages 6-15) and situate it within an Australian context. Due to a variety of reasons outlined in Chapter 4, there were a considerable number of challenges in accessing some, or all of this data to run comprehensive and reliable statistical analyses for the planned purposes of this
study. Changing population numbers, statistical and/or political reasons lead to Australian LGA boundaries being modified over time, combined with the ABS addition of new variables and changed subsets of publicly reporting data throughout the Census' history.

For these reasons, only 2011 descriptive demographic information was obtained for the three “hotspot LGA’s, Perth and Australia in order to provide a broader snapshot of the “hotspot” at the time of the study. Additionally, the need to provide clear parameters for the case study area which were understood by participants was deemed important, particularly in Study 2 where participants included current members of respective LGA councils. To some regard however, using data from the most recent Census at the time of the study rather than the full range of Olympians' developmental years, meant that the most accurate demographic snapshot of the “hotspot” over a historical period could not be achieved. Although, in light of reviewing the historical background of Perth’s Western Suburbs in which the “hotspot” is located and discussion gleaned from Study 2 interviewees, it was considered that the 2011 data still provided an accurate representation of the “hotspot” over time. This was made evident through the aforementioned sources that the suburbs comprising the “hotspot” had not changed dramatically throughout its history, such as becoming more gentrified, given they had always been home to Perth’s wealthiest and well-educated residents.

Being a geographically distant researcher with no prior contacts in Perth or the “hotspot” at the onset of the study caused some difficulties when establishing connections at the commencement of Study 2. When sports club presidents were first contacted about the study, a predominantly male cohort of participants was inadvertently created, before purposive snowball sampling was incorporated as a key recruitment strategy. This is perhaps not surprising, given men are more likely to hold leadership roles within their sports clubs as presidents or other club committee members, whereas women are comparatively under-represented in leadership positions at all levels of sport (Burton, 2015).

Although Study 2 ultimately drew on a broad range of community members across most sports associated with the “hotspot”, the inclusion of a greater balance of participants’ viewpoints could have enhanced the Study. For instance, the study did not include “hotspot” Olympians who had represented Australia in rowing, sailing and water polo, whilst there was an over-representation of female Olympians and participants from the hockey community. Accommodating for these limitations may have provided a more representative view on why the “hotspot” had encompassed a range of sports and identified further sport-specific factors relevant to its occurrence. While two separate trips were made to the “hotspot” totalling one month, in the broader scheme of understanding all factors contributing to a successful talent
development environment, this was a relatively limited period of time. Potentially, this prevented opportunities for further connections with both community members and Olympians under-represented within this study.

Furthermore, those who did participate may have focused more heavily on the positive aspects of sports clubs and other factors within their community after being informed of the “hotspot”. It is possible, that the inclusion of interviews with council representatives and mayors who were not as directly vested in sport, may have resulted in the input of more objective views. From other participant groups, several coaches and parents of elite athletes were interviewed, however ideally could have encompassed a larger number who had direct connections to the interviewed “hotspot” Olympians in order to triangulate the data even more strongly.

Finally, the retrospective nature of the study required both the community and Olympians to recall factors influencing the “hotspot’s” occurrence from up to 30 years or so prior. This also meant Olympians’ experiences were in many cases not entirely triangulated by the views of all key people in their entourage including parents, junior coaches, schools and community clubs. Furthermore, the quantitative demographic and climate data utilised in Study 1 was also historical in nature and unable to encompass the entire 1984-2012 period under investigation, nor all Olympians’ early developmental years, as previously described. Collectively, these factors may impact upon the generalisability of the results of this study to other talent development environments. As Simonton (2003) acknowledges, the limitations of historical analyses can lie in the fallibility of the human mind when recalling events, in addition to informational gaps or errors which have potential to contaminate both quantitative and qualitative analysis. Ultimately however, a retrospective study was deemed the most time-efficient method of investigating the “hotspot”, with reliability of this method supported through its proven use with existing studies in the field (Côté, Ericsson, & Law, 2005; MacDonald, Horton, et al., 2009).

7.5 Recommendations for future research

At the time of undertaking this study, relatively little research had focused specifically on the ‘birthplace effect’ phenomenon upon summer Olympians, or holistically examined community-level influences pertaining to their early athletic development (Baker, Schorer, et al., 2009; LaForge-MacKenzie et al., 2015). Given this study examined one Australian “hotspot” over a retrospective 30-year period, it is recommended that similar studies take place with summer Olympians in different countries across a range of time periods. Additionally, other Australian regions geographically distant from Perth that were included in the ‘Top 20’ “hotspot’s” within this study, could be comparatively examined. Future research
of this nature may further reinforce the findings of this thesis and existing birthplace effect studies, by emphasising common features shared by successful talent development environments. Collectively, acknowledging the similarities and differences between these research outcomes can elucidate the most influential set of factors likely to serve a key role in positively influencing early athletic development. Accordingly, future research in this direction may underpin greater confidence in the potential planning of future “hotspot” towns or environments through clearer illumination of these factors.

As identified in the acknowledging the limitations of this study, future research should also endeavour to draw upon complete historical data sets for demographic and climate information where possible. Collecting population data for the complete developmental periods for athlete cohorts can provide deeper background for understanding a “hotspot” with greater statistical accuracy, alongside providing the ability to make stronger regional or national comparisons to other “hotspot” areas, such as the Top 20 identified in this study. Where this may not be possible in future research due to existing challenges with archival data, potentially, discrete “hotspot’s” can be identified at different stages over a broadly longitudinal period, taking into account era-specific factors that may have led to their occurrence.

Finally, the definition of a “hotspot” could also be modified for different research purposes. For instance, identifying a greater number of Australian Olympic-sport specific “hotspots” in order to build on research by Toohey et al. (2015), which identified high-yield regions in other sports, such as Australian Football (AFL) and cricket. Rather than identifying a “hotspot” compared to the whole population size within a region (per 100,000), athlete yield comparisons could be made in relation to general sports participation rates in a region, similar to that of Toohey’s (2015) aforementioned research. Ultimately, sporting “hotspots” will occur in different places throughout sports history for varying reasons. Although some may be country, culture or context specific, it is likely several key features will be shared. Overall deeper understanding of these similarities may lead to the progression of new athlete development and talent identification practices globally.
7.6 Summary

Overall, this study has provided a retrospective, mixed-methods analysis of an Australian sporting “hotspot” through investigating the relationship between early developmental and Olympic success, via the lens of Bronfenbrenner’s (1979b; 1994b; 1998) ‘Ecological Systems Theory’ and ‘Bioecological Model’. When examining the Perth, WA “hotspot”, it became evident that a confluence of planned and fortuitous process, person, context and time factors during 1984-2012 and the preceding decades, had unintentionally created a “hotspot” of Australian summer Olympians. Several individual, demographic, geographic, historical, individual, social and chance factors were attributed to its development. Ease of access to built and natural facilities, climate, supportive families, schools promoting PA, strong community clubs, opportunities to train and compete with older athletes, access to proximal role models, high SES and an endemic sports culture, were amongst key contributing factors to the development of this “hotspot”.

Overall, the findings of this study supported existing birthplace effect and successful talent development environment literature, whilst simultaneously identifying region-specific factors for the “hotspot’s” occurrence. Although some factors appear unique to the “hotspot”, others are potentially transferable to different athlete development environments. Olympians perceived that factors proximal to them including family, individual psychological characteristics and the junior sports environments at school and in the community had the most decisive influence on their athletic development, above environmental variables. Ultimately, the outcomes of this study highlighted the multi-faceted nature of talent development environments and their influence on expertise attainment.
References


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Henriksen, K. (2010). *The ecology of talent development in sport.* (Doctor of Philosophy PhD), University of Southern Denmark, University of Southern Denmark.


Seddon, G. (1972). *Sense of place: a response to an environment, the Swan Coastal Plain, Western Australia.* Perth: University of Western Australia Press.


Appendix A: Media engagements and outputs arising from this study during data collection and the Rio 2016 Olympic Games


[Also broadcast from the following 5 stations: ABC Broken Hill (Broken Hill), ABC Eyre Peninsula and West Coast (Port Lincoln), ABC North and West SA (Port Pirie), ABC Riverland SA (Renmark), ABC South East SA (Mt Gambier)]


[Also broadcast from the following 8 stations: ABC Esperance (Esperance), ABC Goldfields WA (Kalgoorlie), ABC Great Southern WA (Albany), ABC Great Southern WA (Wagin), ABC Kimberley (Broome), ABC Midwest and Wheatbelt (Geraldton), ABC North West WA (Karratha), ABC South West WA (Bunbury)]


Appendix B: Human ethics approval letter
Research Integrity
Human Research Ethics Committee

Thursday, 4 September 2014

Dr Wayne Cotton
Fac Ed & Soc Wk - Research; Faculty of Education & Social Work
Email: wayne.cotton@sydney.edu.au

Dear Wayne

I am pleased to inform you that the University of Sydney Human Research Ethics Committee (HREC) has approved your project entitled “The influence of early development environment on Olympic success: a multiple case study analysis of Australia’s top sporting Local Government”.

Details of the approval are as follows:

Project No.: 2014/650
Approval Date: 2 September 2014
First Annual Report Due: 2 September 2015
Authorised Personnel: Cotton Wayne; O’Connor Donna; O’Neill Kristy;

Documents Approved:

<table>
<thead>
<tr>
<th>Date Uploaded</th>
<th>Type</th>
<th>Document Name</th>
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<tbody>
<tr>
<td>21/07/2014</td>
<td>Advertisements/Flyer</td>
<td>Participant Recruitment flyer to accompany intro. letter</td>
</tr>
<tr>
<td>29/08/2014</td>
<td>Interview Questions</td>
<td>Interview schedules</td>
</tr>
<tr>
<td>18/07/2014</td>
<td>Participant Consent Form</td>
<td>Participant Consent Form - General</td>
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<td>18/07/2014</td>
<td>Participant Consent Form</td>
<td>Participant Consent Form - Parent/Carer</td>
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<td>18/07/2014</td>
<td>Participant info Statement</td>
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<td>Participant Information Statement - Parent/Carer</td>
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<tr>
<td>18/07/2014</td>
<td>Questionnaires/Surveys</td>
<td>Kristy O’Neill Preliminary online questionnaire</td>
</tr>
<tr>
<td>19/07/2014</td>
<td>Recruitment Letter/Email</td>
<td>Introductory letter to sports clubs</td>
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</table>

HREC approval is valid for four (4) years from the approval date stated in this letter and is granted pending the following conditions being met:

Condition/s of Approval

- Continuing compliance with the National Statement on Ethical Conduct in Research Involving Humans.

- Provision of an annual report on this research to the Human Research Ethics Committee from the approval date and at the completion of the study. Failure to submit reports will result in withdrawal of ethics approval for the project.

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www.humanethics.org

ABN 15 311 513 864
CRICOS 00098J

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• All serious and unexpected adverse events should be reported to the HREC within 72 hours.

• All unforeseen events that might affect continued ethical acceptability of the project should be reported to the HREC as soon as possible.

• Any changes to the project including changes to research personnel must be approved by the HREC before the research project can proceed.

• Note that for student research projects, a copy of this letter must be included in the candidate’s thesis.

Chief Investigator / Supervisor’s responsibilities:

1. You must retain copies of all signed Consent Forms (if applicable) and provide these to the HREC on request.

2. It is your responsibility to provide a copy of this letter to any internal/external granting agencies if requested.

Please do not hesitate to contact Research Integrity (Human Ethics) should you require further information or clarification.

Yours sincerely

[Signature]

[Name]

Professor Glen Davis
Chair
Human Research Ethics Committee

This HREC is constituted and operates in accordance with the National Health and Medical Research Council’s (NHMRC) National Statement on Ethical Conduct in Human Research (2007), NHMRC and Universities Australia Australia Code for the Responsible Conduct of Research (2007) and the CPMP/ICH Note for Guidance on Good Clinical Practice.
Appendix C: Introductory letter to sports clubs
13 October 2014

Dear «First Name»,

Researchers at the University of Sydney have been conducting a study that has identified the Cambridge, Claremont and Nedlands Local Government Areas (LGAs) as the most successful sporting communities in Australia.

Members of your sports club are invited to take part in a research study which aims to investigate the sports culture of these LGAs and identify reasons why this area of Perth in particular has been able to consistently produce a greater relative number of Olympic athletes compared to any other LGA Australia-wide over the past 30 years.

This study aims to investigate individual, social and environmental factors which may have the potential to influence the elite development of athlete’s who grew up in and had their first sporting experiences in the Nedlands, Cambridge and/or Claremont LGA’s. Your club’s involvement in this study will provide important insights into the development of Australian athletes and inform the talent identification community of some of the modifiable and non-modifiable factors which can influence athletic development and performance.

A range of individuals at your sports club are invited to take part in this study. This includes teenage athlete’s currently competing at a State level or higher (≥ 15 years of age), their parents/carers and coaches as well as members of your sports club’s committee. Involvement will initially require completing a 5-minute online questionnaire and may entail taking part in a 40-minute follow up interview based on their experiences and perceptions of being involved in sport with one or more of the aforementioned LGA’s.

For further information, please refer to the attached Participant Information Statement (General and Parent/Carer). If you wish for members of your club to learn about and potentially be involved in this study, please promote involvement through the supplementary flyer and provide access to Information and Consent forms in a way you
deem suitable for your club members (i.e. club newsletter, email, in person, via coaches).

If you wish to partake in this study or have any questions or concerns, please feel free to contact Kristy O’Neill (PhD candidate) kristy.oneill@sydney.edu.au (P: 0411575484) or Dr. Wayne Cotton (Supervisor) wayne.cotton@sydney.edu.au (P: 02 9351 6278).

Yours faithfully,

Kristy O’Neill
Wayne Cotton
Appendix D: Flyer
Would you like to find out why your area of Perth is Australia’s leading Olympic athlete producing community?

If you answered yes, then you may like to be involved in a short online anonymous questionnaire (approx. 5 minutes) to share your experiences of being involved in sport. Furthermore, if you are interested in sharing your story and experiences of being a participant in Perth’s strong sports culture you may wish to meet with a researcher from the University of Sydney to discuss your experiences via a one-on-one interview. Your involvement will potentially strengthen the development of Australia’s next generation of Olympic athletes and give back to your wider sports community through sharing your thoughts on some of the modifiable and non-modifiable factors influencing athletic development in this area of Perth.

As part of a research project, the University of Sydney is interested in contacting the following groups of people for this study:

<table>
<thead>
<tr>
<th>Current and prospective junior elite athletes (≥15 years of age)</th>
<th>Parents/guardians of current and prospective junior elite athletes</th>
<th>Coaches of current high performance/elite junior athletes</th>
<th>Club committee members or volunteers</th>
</tr>
</thead>
</table>

**Time:** Before or after training sessions or club nights at a time convenient for you  
**Place:** At your home club location or training grounds  
**Cost:** Free  
**Dates:** In November 2014, a researcher from the University of Sydney will be visiting Perth and your sports club to conduct interviews.

**What you will get out of being involved:**

- The opportunity to share your experiences and pride in being a member of one of Australia’s most talented sporting communities
- Indirectly contribute to the athletic development of future Australian Olympians by sharing your story

**What do I need to do?**

For more information, please contact your sports club President or Kristy O’Neill (kristy.oneill@sydney.edu.au) and Dr Wayne Cotton (wayne.cotton@sydney.edu.au) from the University of Sydney directly via email.
Appendix E: Participant Information Statement (General)
The influence of early developmental environment on Olympic success: a multiple case study analysis of Australia’s top sporting Local Government Areas (LGA’s)

PARTICIPANT INFORMATION STATEMENT

(1) What is this study about?

This research study aims to identify Australia’s most successful sporting communities and the reasons for their ability to produce a greater relative number of Olympic athletes. You have been invited to participate in this study because your area of Perth has been identified as one of Australia’s most successful communities regarding national production of Olympic athletes. The study will investigate individual, social and environmental factors which may have the potential to influence elite athletic development and seek to inform the talent identification community of some of the modifiable and non-modifiable factors which can influence athletic development and performance.

This Participant Information Statement tells you about the research study. Knowing what is involved will help you decide if you want to take part in the research. Please read this sheet carefully and ask questions about anything that you don’t understand or want to know more about.

Participation in this research study is voluntary. So it’s up to you whether you wish to take part or not.

By giving your consent to take part in this study you are telling us that you:

✓ Understand what you have read
✓ Agree to take part in the research study as outlined below
✓ Agree to the use of your personal information as described.

You will be given a copy of this Participant Information Statement to keep.

(2) Who is running the study?

The study is being carried out by Dr Wayne Cotton (Senior Lecturer) and Kristy O’Neill (PhD candidate) from the University of Sydney.
(3) What will the study involve for me?

If you choose to be involved in the study the first stage will involve completing an online questionnaire of approximately 5 minutes in length regarding the nature of your sporting involvement and your experiences of being involved in sport within your LGA. This will include reflecting on your opinion of how you believe individual, social and environmental factors within your LGA may influence the development of young, aspiring elite athletes in this community and if relevant, involve reflection on your own athletic development.

The completion of this online questionnaire will take place in your own time through following a hyperlink which will be provided to your sports Club President and then passed on to members of the club. A range of individuals within your sports club are invited to take part. This questionnaire will be available online until November 24, 2014. At the conclusion of the questionnaire, you will be provided the option to express interest in participating in a follow up interview. In doing so, you will be required to provide your full name and contact details (email and/or contact number). This is so that the research team can contact you if you are chosen to take part in the next stage of the study.

The research team will then choose a selection of participants who have expressed interest to be involved in a follow up interview. This interview will be approximately 40 minutes in length and cover a range of in-depth questions in relation to themes similar to those in the online questionnaire. Interviews will be face-to-face and conducted by Kristy O’Neill in a designated and public location such as your sports club or associated venue. If you have previously provided consent, interviews will be audio recorded in order to assist the research team with analysis. Following the interview, interviews will be transcribed verbatim and then sent to you for respondent validation. This will provide you with the opportunity to clarify or omit any material discussed in interviews.

(4) How much of my time will the study take?

It is expected that the online questionnaire will take approximately 5 minutes. Individuals who express interest in and are chosen to take part in a follow-up interview can expect this to take approximately 40 minutes.

(5) Who can take part in the study?

A range of individuals whose sports club President was contacted in relation to the research are invited to partake in the study. These groups include

- Current high performance/prospective elite athletes (junior athletes currently competing at a state level or higher) (≥ 15 years of age)

- Parents of current high performance/prospective athletes (junior athletes currently competing at a state level or higher)

- Adult coaches of current high performance/prospective elite athletes (junior athletes currently competing at a state/national? level or higher)

- Club committee members

The influence of early developmental environment on Olympic success: a multiple case study analysis of Australia’s top sporting Local Government Areas (LGA’s)

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(6) Do I have to be in the study? Can I withdraw from the study once I’ve started?

Being in this study is completely voluntary and you do not have to take part. Your decision whether to participate will not affect your current or future relationship with the researchers or anyone else at the University of Sydney.

If you decide to take part in the study and then change your mind later, you are free to withdraw at any time. You can do this by declining to complete the anonymous questionnaire or contacting the research team directly if you wish to withdraw from an arranged interview.

Submitting your completed questionnaire is an indication of your consent to participate in the study. You can withdraw your responses any time before you have submitted the questionnaire. Once you have submitted it, your responses cannot be withdrawn because they are anonymous and therefore we will not be able to tell which one is yours.

You are free to stop the interview at any time. Unless you say that you want us to keep them, any recordings will be erased and the information you have provided will not be included in the study results. You may also refuse to answer any questions that you do not wish to answer during the interview.

(7) Are there any risks or costs associated with being in the study?

Aside from giving up your time, we do not expect that there will be any risks or costs associated with taking part in this study.

(8) Are there any benefits associated with being in the study?

We cannot guarantee or promise that you will receive any direct benefits from being in the study. Your participation however, will extend existing research on expertise development in sport. The results of this study may have the potential to inform the wider sporting and talent identification community about some of the modifiable and non-modifiable factors which can influence an athlete’s early developmental environment and subsequent sporting performance.

(9) What will happen to information about me that is collected during the study?

By providing your consent, you are agreeing to us collecting personal information about you for the purposes of this research study. Your information will only be used for the purposes outlined in this Participant Information Statement, unless you consent otherwise.

Your information will be stored securely and your identity/information will be kept strictly confidential, except as required by law. Study findings may be published. Although every effort will be made to protect your identity, there is a risk that you might be identifiable in publications due to the nature of the study and/or the results.

The types of information collected and used in this study will be general demographic data and your thoughts regarding how individual, social and environmental factors within your LGA may influence the development of young, aspiring elite athletes in this community. If you are involved in an interview and consent to audio recording, these will be used by the research team for the purpose of analysis only, with the possibility of some quotations used in publication although your identity will remain anonymous. It is not anticipated that any third parties including transcription services, will have access to your information as the research team intends to carry out all transcription and analysis of data. Online survey hosts will not have access to your personal information as all
questionnaires will be conducted anonymously. Due to the anonymous nature of the online questionnaire, once completing this component of the study your responses will not be able to be withdrawn due to inability of the researchers to identify your individual responses. If you are involved in an in-depth, follow-up interview you will be provided with a transcribed version of your interview with opportunity to provide clarification or omit any material discussed in interviews.

All data collected for the purpose of this study will be utilised for the purpose of a PhD thesis, with expectations that in the future the results will be disseminated via publication in journal articles, books and/or conferences. Data will be stored for a period of 5 years per the University of Sydney Ethics Committee requirements. All data collected and research related material will be kept in a locked storage cabinet which is only accessible to the research team. Following this period, all data will be destroyed.

(10) Can I tell other people about the study?

Yes, you are welcome to tell other people about the study.

(11) What if I would like further information about the study?

When you have read this information, Kristy O’Neill will be available to discuss it with you further and answer any questions you may have. If you would like to know more at any stage during the study, please feel free to contact Kristy O’Neill or Wayne Cotton.

Contact details:
Kristy O’Neill (PhD Candidate) University of Sydney.
Telephone 0417 577484 or E-mail: kristy.onell@sydney.edu.au.
Dr Wayne Cotton (Senior Lecturer) University of Sydney.
Telephone: 9351 6278 or E-mail: wayne.cotton@sydney.edu.au

(12) Will I be told the results of the study?

You have a right to receive feedback about the overall results of this study. You can tell us that you wish to receive feedback by answering the relevant question in the online questionnaire. For questionnaires, this feedback will be based on general group-based results and in the form of a one page lay summary which will be emailed to and distributed by your Club President in the way they see fit (i.e. via email, club newsletter, printed summary). You will receive this feedback after the study is finished.

Individuals who are involved in the interview process will be contacted directly via email, whereby they will be provided with a verbatim copy of the interview transcript for respondent validation. An objective, de-identified general summary of results will be provided to all interview participants at the completion of the study.

(13) What if I have a complaint or any concerns about the study?

Research involving humans in Australia is reviewed by an independent group of people called a Human Research Ethics Committee (HREC). The ethical aspects of this study have been approved by the HREC of the University of Sydney [Project No.: 2014/650]. As part of this process, we have agreed to carry out the study according to the National Statement on Ethical Conduct in Human Research (2007). This statement has been developed to protect people who agree to take part in research studies.
If you are concerned about the way this study is being conducted or you wish to make a complaint to someone independent from the study, please contact the university using the details outlined below. Please quote the study title and protocol number.

The Manager, Ethics Administration, University of Sydney:
- **Telephone:** +61 2 8627 8176
- **Email:** ro.humanethics@sydney.edu.au
- **Fax:** +61 2 8627 8177 (Facsimile)

*This information sheet is for you to keep*
Appendix F: Sample interview schedules (Community)
1. **Parents/caregivers of elite athletes**

**Interviewee’s background**
- Tell me about yourself and your association with LGA ‘X’?
- How do you feel about your child being a part of the sporting community in LGA ‘X’?

**Introduction (General about the LGA)**
- Are you surprised to hear that community ‘X’ is one of Australia’s most successful Local Government Areas (LGA’s) regarding the production of Olympic athletes? Why/why not?
- Do you think that the environment in LGA ‘X’ is influential in successful athletic talent development for children and teenagers who grow up in this area? How/Why?
- What are the key ingredients you think LGA ‘X’ contributes to producing successful athletes?

**Micro-system (environment inclusive of sports club, family, school and other immediate influences)**
- How involved has your family been in sport generally? Are there other high achievers in sport within your family?
- What about outside of the family? How influential do you feel key individuals in your child’s life (external to the family) have been in influencing your/their sports development?
- How would you describe the coaching (quality/style) in your/your child athlete’s sport in LGA ‘X’?
- How would you describe your/your child’s main coach prior to 15 years of age? What are/were the coach’s values?
- Do older/more successful athletes influence the younger/less experienced athletes within your/your child’s sports club? How?
- What influence do you think local schools and in particular your child’s school has in developing sporting talent in LGA ‘X’?

**Exo-system**
- What are some of the features of LGA ‘X’ that you think are advantageous to young athlete’s growing up in the area? (i.e. physical/natural, built, social/community).
- Do you have a personal theory as to why LGA ‘X’ seems to be more successful in producing Olympic athletes (per head of the population) compared to other areas of Australia?
- Do you feel as though sport and sports achievement is valued in LGA ‘X’? If so, how is this expressed?
- Do you feel these attitudes either directly or indirectly influence the development of young athlete’s? Why/why not?

**Macro-system**
- Do you feel as though the wider culture of your child’s sport (LGA and beyond) promotes elite development and sporting success to young athletes? Why/How?
- What role/do you think sport plays a big role in Australian culture and identity? Why/why not?
- In what way do you feel the nation’s attitudes to sport influence young aspiring athletes (in LGA ‘X’)? Do you feel as though Australia’s national sporting culture influences the day to day life of athlete’s in LGA ‘X’ and the extent of their sports involvement?

**Conclusion**
- Thank you for your time and allowing me to interview you. Is there anything else you would like to add that you did not have a chance to mention earlier?
2. **Current junior/senior elite athletes**

**Interviewee's background**

- Tell me about yourself and your association with LGA ‘X’?
- How do you feel about your child being a part of the sporting community in LGA ‘X’?

**Introduction (General about the LGA)**

- Are you surprised to hear that community ‘X’ is one of Australia’s most successful Local Government Areas (LGA’s) regarding the production of Olympic athletes? Why/why not?
- Do you think that the environment in LGA ‘X’ is influential in successful athletic talent development for children and teenagers who grow up in this area? How/Why?
- What are the key ingredients you think LGA ‘X’ contributes to producing successful athletes?

**Micro-system (environment inclusive of sports club, family, school and other immediate influences)**

- How involved has your family been in sport generally? Are there other high achievers in sport within your family?
- What about outside of the family? How influential do you feel key individuals in your life have been in influencing your sports development?
- How would you describe the coaching (quality/style) in your sport in LGA ‘X’?
- How would you describe your main coach prior to 15 years of age? What are/were the coach’s values?
- Do older/more successful athletes influence the younger/less experienced athletes within your/your child’s sports club? How?
- What influence do you think local schools and in particular your school has in developing sporting talent in LGA ‘X’?

**Exo-system**

- What are some of the features of LGA ‘X’ that you think are advantageous to young athlete’s growing up in the area? (i.e. physical/natural, built, social/community).
- Do you have a personal theory as to why LGA ‘X’ seems to be more successful in producing Olympic athletes (per head of the population) compared to other areas of Australia?
- Do you feel as though sport and sports achievement is valued in LGA ‘X’? If so, how is this expressed?
- Do you feel these attitudes either directly or indirectly influence the development of young athlete’s? Why/why not?

**Macro-system**

- Do you feel as though the wider culture of your sport (LGA and beyond) promotes elite development and sporting success to young athletes? Why/How?
- What role/ do you think sport plays a big role in Australian culture and identity? Why/why not?
- In what way do you feel the nation’s attitudes to sport influence young aspiring athletes (in LGA ‘X’)? Do you feel as though Australia’s national sporting culture influences the day to day life of athlete’s in LGA ‘X’ and the extent of their sports involvement?

**Conclusion**

- Thank you for your time and allowing me to interview you. Is there anything else you would like to add that you did not have a chance to mention earlier?
3. **Coaches**

**Interviewee's background**

- Tell me about yourself and your association with LGA ‘X’?
- How do you feel about being a part of the sporting community in LGA ‘X’?

**Introduction (General about the LGA)**

- Are you surprised to hear that community ‘X’ is one of Australia’s most successful Local Government Areas (LGA’s) regarding the production of Olympic athletes? Why/why not?
- Do you think that the environment in LGA ‘X’ is influential in successful athletic talent development for children and teenagers who grow up in this area? How/Why?
- What are the key ingredients you think LGA ‘X’ contributes to producing successful athletes?

**Micro-system (environment inclusive of sports club, family, school and other immediate influences)**

- How influential do you feel the role of an athlete’s family is in their development?
- What types of supports or resources do you think are most important for families to provide to their developing child athlete?
- How would you generally describe the coaching culture in your sport/sports club in LGA ‘X’?
- Do older/more successful athletes influence the younger/less experienced athletes within your sports club? How?
- What influence do you think local schools have in developing sporting talent in LGA ‘X’? Do you feel this supports the aims you are trying to achieve as a coach within the sport?

**Exo-system**

- What are some of the features of LGA ‘X’ that you think are advantageous to young athlete’s growing up in the area? (i.e. physical/natural, built, social/community).
- Do you have a personal theory as to why LGA ‘X’ seems to be more successful in producing Olympic athletes (per head of the population) compared to other areas of Australia?
- Do you feel as though sport and sports achievement is valued in LGA ‘X’? If so, how is this expressed?
- Do you feel these attitudes either directly or indirectly influence the development of young athlete’s? Why/why not?

**Macro-system**

- Do you feel as though the wider culture of your sport (LGA and beyond) promotes elite development and sporting success to young athletes? Why/How?
- What role/ do you think sport plays a big role in Australian culture and identity? Why/why not?
- In what way do you feel the nation’s attitudes to sport influence young aspiring athletes? Do you feel as though Australia’s national sporting culture influences the day to day life of athlete’s in LGA ‘X’ and the extent of their sports involvement?

**Conclusion**

- Thank you for your time and allowing me to interview you. Is there anything else you would like to add that you did not have a chance to mention earlier?
4. **Sports club committee members**

**Interviewee’s background**
- Tell me about yourself and your association with LGA ‘X’?
- How do you feel about being a part of the sporting community in LGA ‘X’?

**Introduction (General about the LGA)**
- Are you surprised to hear that community ‘X’ is one of Australia’s most successful Local Government Areas (LGA’s) regarding the production of Olympic athletes? Why/why not?
- Do you think that the environment in LGA ‘X’ is influential in successful athletic talent development for children and teenagers who grow up in this area? How/Why?
- What are the key ingredients you think LGA ‘X’ contributes to producing successful athletes?

**Micro-system (environment inclusive of sport, family, school and other immediate influences)**
- How influential do you feel the role of an athlete’s sports club is in their development?
- What types of supports or resources do you think are most important for sports clubs and their members to provide to a developing child athlete?
- How would you generally describe the coaching culture in your sport/sports club in LGA ‘X’?
- Do older/more successful athletes influence the younger/less experienced athletes within your sports club? How?

**Exo-system**
- What are some of the features of LGA ‘X’ that you think are advantageous to young athlete’s growing up in the area? (i.e. physical/natural, built, social/community).
- Do you have a personal theory as to why LGA ‘X’ seems to be more successful in producing Olympic athletes (per head of the population) compared to other areas of Australia?
- Do you feel as though sport and sports achievement is valued in LGA ‘X’? If so, how is this expressed?
- Do you feel these attitudes either directly or indirectly influence the development of young athlete’s? Why/why not?

**Macro-system**
- Do you feel as though the wider culture of your sport (LGA and beyond) promotes elite development and sporting success to young athletes? Why/How?
- What role/ do you think sport plays a big role in Australian culture and identity? Why/why not?
- In what way do you feel the nation’s attitudes to sport influence young aspiring athletes? Do you feel as though Australia’s national sporting culture influences the day to day life of athlete’s in LGA ‘X’ and the extent of their sports involvement?

**Conclusion**
- Thank you for your time and allowing me to interview you. Is there anything else you would like to add that you did not have a chance to mention earlier?
5. **Members of local government/council (i.e. mayor)**

**Interviewee's background**

- Tell me about yourself and your association with LGA ‘X’?
- Have you been very involved in sport in LGA ‘X’ both in your role as the mayor and otherwise?

**Introduction (General about the LGA)**

- Are you surprised to hear that community ‘X’ is one of Australia’s most successful Local Government Areas (LGA’s) regarding the production of Olympic athletes? Why/why not?
- Do you think that the environment in LGA ‘X’ is influential in successful athletic talent development for children and teenagers who grow up in this area? How/Why?
- What are the key ingredients you think LGA ‘X’ contributes to producing successful athletes?

**Micro-system (environment inclusive of sport, family, school and other immediate influences)**

- Using LGA ‘X’ as an example, how influential do you feel the role of the wider community is contributing to the development of aspiring young athletes?
- What type of role do you feel (each of the following) have in influencing the development of young athlete’s:
  - Local sports clubs (including coaches)
  - Families
  - Schools

**Exo-system**

- What are some of the features of LGA ‘X’ that you think are advantageous to young athlete’s growing up in the area? (i.e. physical/natural, built, social/community).
- Do you have a personal theory as to why LGA ‘X’ seems to be more successful in producing Olympic athletes (per head of the population) compared to other areas of Australia?
- Do you feel as though sport and sports achievement is valued in LGA ‘X’? If so, how is this expressed?
- Do you feel these attitudes either directly or indirectly influence the development of young athlete’s? Why/why not?
- What type of funding or financial support is available to local junior athletes, community clubs and sporting facilities (from the council)?

**Macro-system**

- Do you feel as though the wider culture of the LGA ‘X’ community promotes elite development and sporting success to young athletes? Why/How?
- What role/ do you think sport plays a big role in Australian culture and identity? Why/why not?
- In what way do you feel the nation’s attitudes to sport influence young aspiring athletes? Do you feel as though Australia’s national sporting culture influences the day to day life of athlete’s in LGA ‘X’ and the extent of their sports involvement?

**Conclusion**

- Thank you for your time and allowing me to interview you. Is there anything else you would like to add that you did not have a chance to mention earlier?
Appendix G: Sample interview schedule (Olympians)
Summary

General background (Re: LGA)

- Surprised that Cambridge/Claremont/Nedlands is one of Australia’s most successful sporting LGA regarding production of Olympic athletes? Why/why not?
- Key ingredients (i.e. 3) that you think the LGAs contribute to producing successful athletes. [Or as a summary question at the end so they have time to reflect]

Athlete background

(Ask as specific q’s OR will already know some of their background/it will come up in discussion)

- Clarify their personal association with the Cambridge/Claremont/Nedlands area compared to what I know.
- Sports involvement growing up prior to 15 years (including affiliation with Olympic sport)
- Personal qualities/traits: i.e. 3 they feel have most contributed to their success as an athlete

Micro-system

- **Family**:
  - Parents: Good at sport? Paid vs. unpaid roles during junior sports years? Types of supports provided – which were most important?
  - Siblings: How many/family size/birth order? Good at sport? Other influences?
  - Extended family: Good at sport? Other influences?
- **School**:
  - Was your school influential in your sporting career? Influential teacher or coach? Facilities? School competitions? How?
- **The sports environment (i.e. local junior sports club’s + WA + AU)**
  - Coaches/coaching: Main coach before 15 – what was their coaching style like? Did they contribute significantly?
  - Peers: Within and outside of sport –impact on career development? How?
  - Training/competition history: What most strongly influenced decision to specialise? Did you always want to be an elite athlete?
  - Mentors/role models/club culture
  - Talent ID: Who identified? Did you have to change clubs OR leave the area? OR were you well catered for locally?
  - Individual sports culture (WA and AU level): Strong focus on elite development at a junior level? Awareness or fun? Did how successful AU was or not at an international level influence you to be successful in that sport?

Exo-system

- **Physical environment (Natural):** Climate? Natural features i.e. beaches, rivers, parks
- **Physical environment (Built):** Access to facilities (school and community)? Empire Games (facilities and psyche)? Large backyards?
- **Social environment:** Safety? Community interest in sport/positive sense of community? People stay in the area – established (local and clubs)? ‘Family’ feel of local clubs?
- **Council:** Planning and funding for local sports facilities? Access to parks and green space?
- **Daylight saving (lack of):** Help or hindrance to training? Encouraging people to do PA?
- **Regulated shopping hours:** Encourage people/families to be more PA, involved in sport, outdoors?
- **Demographic:** High SES area, access to sports, more time to train, less paid work teenagers?
Macro-system

- Individual sports culture: i.e. Hockey Australia Hockey WA – focused on excellence young age? Supportive to athletes? Well-structured ‘tiers’ within the sport as you progress?
- National and State sporting institutes; i.e. Talent ID? (Ease of) Access to? Supports - what kind?
- Role of sport in Australia/national identity: Especially Olympic sport. How did this influence your sporting ambitions? How do you think it influences young aspiring athletes in area?

Conclusion

- Thank you for your time and allowing me to interview you. Is there anything else you would like to add that you did not have a chance to mention earlier?
Appendix H: Safety Protocol employed during Study 2 data collection
Safety Protocol

**Project title:** “The influence of early developmental environment on Australian Olympic athletes: a multiple case study analysis of Australia’s top sporting communities”

**Chief Investigator:** Dr Wayne Cotton (Supervisor)

**Other personal involved:** Associate Professor Donna O’Connor (Associate Supervisor) & Kristy O’Neill (PhD candidate)

This research involves one-on-one interviews with individuals who are affiliated with the sports of Hockey, Swimming and Rowing within the case study communities of Cambridge, Claremont and Nedlands (Local Government Areas located within Perth, Western Australia). This includes athletes, parents, coaches, sports club committee members and members of local council who may be responsible for funding these sports facilities. The Supervisor (Dr Wayne Cotton) considers the safeguards provided in the safety protocol as being sufficient to manage possible safety concerns which may arise whilst the case study is being conducted.

Prior to commencing, the Supervisor and PhD candidate will discuss interview techniques and safety surrounding the conduct of interviews in a professional manner including how to respond to difficult or unpleasant reactions.

Interview participants will be given the opportunity to nominate the time and location of the interview. Possible locations include:

- At the participant’s training facility or sports club (during daylight hours or the early evening)
- At a mutually agreed upon public location (e.g. a cafe or library)

The PhD candidate will be conducting all interviews within the Perth area. The candidate will inform both the Supervisor and Associate Supervisor of the time and location of each interview and will communicate before and after each interview. The candidate will carry a mobile phone for use in the event of an emergency and a University of Sydney student identification card at all times.

Steps to ensure the researcher’s safety include:

- Conducting the interview in a public place in daylight hours where possible.
- Ensuring that doors are not locked upon entering interview spaces and that the exit route is clearly known.
- Carrying a mobile phone at all time for emergencies and to keep in regular contact with both the Supervisor and Associate Supervisor.

The PhD candidate will dress appropriate to the research context and culture. This means wearing tidy and professional attire which would be suitable to a university setting or attire which would enable the researcher to blend in with the sporting context of the case study environment (such as the University branded Human Movement Health Education staff polo shirts).

Transport to and from the interviews will either be by hire car which will be rented for the duration of the case study period or via public transport.

This safety protocol has been agreed and accepted by the researcher and the Supervisor.
Appendix I: Table AI Tukey HSD multiple comparisons for aspects of Australian climate reported by capital cities
Table Al Tukey HSD multiple comparisons for aspects of Australian climate reported by capital cities

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<th>Dependent variable</th>
<th>Capital City</th>
<th>All other capital cities</th>
<th>Mean difference</th>
<th>Std. Error</th>
<th>Sig.**</th>
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* The mean difference is significant at the .05 level
**p<.05
Appendix J: Study 2 semi-structured interview participant profile
## Study 2 semi-structured interview participant profile

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<tr>
<th>Pseudonym name</th>
<th>Gender</th>
<th>Age*</th>
<th>Sport/Organisation</th>
<th>Role</th>
<th>Additional information*</th>
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</table>
| Alex           | M      | 20's | Hockey             | Senior elite athlete | ≥ 20 years living in and being involved in sport in the “hotspot” as an elite athlete, coach and club committee member  
Son of Bill (Club committee member) |
| Andrea         | F      | 40's | Canoe/Kayak        | Olympian | 2000 Olympian (semi-finalist)  
Began canoe/kayak as an adult in the “hotspot” |
| Angela         | F      | Teens | Hockey            | Junior elite athlete | ≤5 years involvement in the “hotspot” sporting community as a junior elite athlete  
Daughter of Sue (parent of junior elite athlete) |
| Bill           | M      | 50's | Hockey             | Club committee member | ≥20 years involvement in the “hotspot” sporting community as an athlete, coach, club committee member and parent of elite athlete (Alex) |
| Brian          | M      | 60's | Swimming           | Coach | ≥30 years living in and coaching high performance swimmers across Perth including some Olympians |
| Colin          | M      | 50's | Hockey             | Club committee member | ≥30 years living in and being involved in sport in the “hotspot” as an elite athlete, club committee member and parent of elite athletes: Felicity (female hockey Olympian) and Mitchell (club committee member) |
| Darren         | M      | 40's | Hockey             | Coach | ≥20 years involvement in the “hotspot” sporting community as coach and athlete |
| David          | M      | 30's | Athletics          | Olympian | 2000, 2004 and 2008 Olympian (finalist) |
| Felicity       | F      | 20s's | Hockey            | Olympian | 2012 Olympian (quarter-finalist)  
Daughter of Colin and sister of Mitchell (both club committee members) |
<p>| Gina           | F      | 40's | Water Polo         | Parent of junior and senior elite athletes | ≥10 years living in and being involved in sport in the “hotspot” as club committee member and mother of junior and senior elite athletes |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Gender</th>
<th>Age</th>
<th>Sport</th>
<th>Role</th>
<th>Experience Notes</th>
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<tr>
<td>Greg</td>
<td>M</td>
<td>40's</td>
<td>Swimming</td>
<td>Coach</td>
<td>≥ 10 years experience coaching elite and Olympic athletes in the “hotspot” and beyond, including “hotspot” swimmers during the strongest years of Olympic representation (2000’s)</td>
</tr>
<tr>
<td>Jacqui</td>
<td>F</td>
<td>30's</td>
<td>Swimming</td>
<td>Coach</td>
<td>≥ 10 years experience coaching elite and Olympic athletes in the “hotspot” and beyond, including “hotspot” swimmers during the strongest years of Olympic representation (2000’s)</td>
</tr>
<tr>
<td>Jenny</td>
<td>F</td>
<td>40's</td>
<td>Athletics</td>
<td>Olympian</td>
<td>1996 Olympian (finalist)</td>
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<tr>
<td>Jesse</td>
<td>M</td>
<td>Teens</td>
<td>Hockey</td>
<td>Junior elite athlete</td>
<td>≤5 years involvement in the “hotspot” sports community as a junior elite athlete</td>
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<td>Joe</td>
<td>M</td>
<td>40's</td>
<td>Council A</td>
<td>Community development officer (Recreation)</td>
<td>Recreation officer with Council “A” who grew up in the “hotspot” and possesses familiarity with club, facilities and funding for sport</td>
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<td>40's</td>
<td>Hockey</td>
<td>Parent of junior elite athlete</td>
<td>≤5 years involvement in the “hotspot” sports community as the parent of a junior elite athlete (Jesse)</td>
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<tr>
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<td>Hockey</td>
<td>Parent of senior elite athlete</td>
<td>≥20 years involvement in sport within the “hotspot” as an athlete, club committee member and parent of a senior elite athlete</td>
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<td>Lara</td>
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<td>Olympian</td>
<td>2008 Olympian (finalist)</td>
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<tr>
<td>Linda</td>
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<td>40's</td>
<td>Surf lifesaving</td>
<td>Parent of junior elite athlete</td>
<td>≤5 years involvement in the “hotspot” sports community as the parent of a junior elite athlete (Megan)</td>
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<td>Gymnastics</td>
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<td>≥ 30 years involvement as a high performance sports administrator and coach within the “hotspot”</td>
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<td>Previous coach of Monica (Olympian)</td>
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<td>Loretta</td>
<td>F</td>
<td>50's</td>
<td>Athletics</td>
<td>Coach</td>
<td>≥ 20 years involvement as a high performance coach and administrator in the “hotspot” with affiliations to both WAIS and UWA</td>
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<td>20's</td>
<td>Gymnastics</td>
<td>Olympian</td>
<td>2008 and 2012 Olympian (finalist)</td>
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<tr>
<td>Name</td>
<td>Gender</td>
<td>Age</td>
<td>Sport/Club Role</td>
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<td>Council A</td>
<td>Mayor&lt;br&gt;Long-term “hotspot” resident and Mayor of Council A who has a general knowledge and interest in local sports clubs, facilities, funding, history and town planning</td>
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<td>40's</td>
<td>Council B</td>
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<td>F</td>
<td>Teens</td>
<td>Surf lifesaving</td>
<td>Junior elite athlete&lt;br&gt;≤5 years involvement in the “hotspot” sports community as a junior elite athlete in surf lifesaving and swimming&lt;br&gt;Daughter of Linda (parent of junior elite athlete)</td>
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<td>Hockey</td>
<td>Club committee member&lt;br&gt;≥ 20 years living in and being involved with sport in the “hotspot” as a previous senior elite athlete and club committee member&lt;br&gt;Brother of Felicity (Olympian), son of Colin (club committee member)</td>
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<tr>
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<td>F</td>
<td>40's</td>
<td>Gymnastics</td>
<td>Olympian&lt;br&gt;1992 Olympian (reserve)&lt;br&gt;Previously coached by Lisa (high performance sports administrator)</td>
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<tr>
<td>Paul</td>
<td>M</td>
<td>50's</td>
<td>Water Polo</td>
<td>Club committee member&lt;br&gt;≥30 years living in and being involved in sport in the “hotspot” as an athlete, coach and high performance sports administrator&lt;br&gt;His water polo club had two 1984-2012 Olympians (not-interviewed)</td>
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<tr>
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<td>Club committee member&lt;br&gt;≥ 20 years living in and being involved with sport in the “hotspot as an athlete, coach and club committee member</td>
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<td>Olympian&lt;br&gt;1984 and 1988 Olympian, as well competitor and silver medallist pre-1984&lt;br&gt;≥30 years living in and being involved in sport in the “hotspot” as an elite athlete and high performance coach</td>
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<td>Rowing</td>
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<td>40's</td>
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<td>Parent of junior elite athlete</td>
<td>≤5 years involvement in the “hotspot” sports community as the parent of a junior elite athlete (Angela)</td>
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* Approximate age and general additional information provided for privacy reasons