

Protective or Problematic Influences? Individual Differences in Motivation, Personality and Vulnerability to Risky Peers in Adolescent Sport

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Drane, Catherine Frances

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**Protective or Problematic Influences? Individual Differences in Motivation,
Personality and Vulnerability to Risky Peers in Adolescent Sport.**

Mrs Catherine Frances Drane
B.Psych (Honours)

School of Applied Psychology
Griffith Health
Griffith University

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Abstract

Why do some adolescents who participate in extracurricular sport benefit, whereas others do not? There is extensive research outlining the role sport plays in positive adolescent development (Barber, Abbott, Blomfield, & Eccles, 2009; Feldman & Majasko, 2005; Marsh & Kleitman, 2002). Despite this, findings also point to links between sport and risky behaviour, specifically alcohol use (Eccles & Barber, 1999; Modecki, Barber, & Eccles, 2014). To develop a more nuanced understanding of the sport context and explain this diversity of outcomes, this thesis examines individual differences among adolescent athletes and how these contribute to positive outcomes and risks among adolescents who are embedded in the sport environment. Thus, several approaches to the measurement of individual differences within the sport context are adopted to better understand how individual attributes of athletes may promote positive experiences within the sports context for some adolescents and contribute to susceptibility to risk for others. Data were collected for the three empirical studies from a sample of Western Australian adolescents in conjunction with the Youth Activity Participation Study of Western Australia (YAPS-WA. Study 1 (Chapter 3) utilizes Wave 4 data (Year 9 and year 12), study 2 (Chapter 4) uses longitudinal data from Wave 1 through to Wave 4 (Year 8 – Year 11). Study 3 (Chapter 5) also longitudinal, uses data from Wave 1 to Wave 3 (Year 8 – Year 10) (see Appendix A for a copy of the entire Wave 4 survey).

Study 1, examined whether the motivational constructs of attainment value and ability self-concept were related to positive developmental experiences in two domains, identity formation and flow in sport, and tested intensity of participation as a moderator of this relation. Higher levels of attainment value and ability self-concept in sport were related to more identity and flow experiences. Intensity of participation moderated the

links between attainment value and identity and flow, and between ability self-concept and identity, but only for older students.

Study 2, described simultaneous within-person change in adolescent binge drinking, ability self-concept and depressed mood for adolescent athletes across four years. A multivariate growth curve model tracked early levels and simultaneous change in binge drinking, ability self-concept, and depressed mood in sports. Early high levels of ability self-concept predicted subsequent decreases in binge drinking, and early high levels of depressed mood predicted subsequent increases in binge drinking in adolescent sport. Developmental increases in ability self-concept paralleled developmental increases in binge drinking, even after accounting for development of depressed mood.

Study 3, described simultaneous within-person change in adolescent binge drinking, sensation seeking and risky peer affiliation for adolescents in sport across three years. A multivariate growth curve model tracked early levels and concurrent change in binge drinking, sensation seeking, and risky peers in sports. Early levels of sensation seeking and risky peers in sport were positively and significantly associated with early levels of binge drinking. Further, early high levels of sensation seeking predicted increases in risky peer associations and binge drinking. After accounting for development of sensation seeking, developmental increases in risky peer associations paralleled developmental increases in binge drinking.

In summary, this dissertation demonstrates that understanding individual differences among adolescent athletes is important for understanding risks and protections offered by sport to adolescent athletes. The findings indicate that positive developmental experiences depend on the fit between the values and motivations of athletes and the sporting environment in which they are embedded. If the sport environment is a good match to adolescents' motivations in sport, then positive

developmental experiences are more likely. However, if an athlete's motivations are not well aligned with the sport environment, then they may be more vulnerable to risk. Indeed, adolescent athletes vary in their susceptibility to risk, in particular binge drinking. Some individual differences among athletes appear to counter increases in drinking, while others appear to facilitate drinking escalations in the sport context, which is known to be problematic in this regard.

Statement of Originality

This work has not previously been submitted for a degree or diploma in any university.

To the best of my knowledge and belief, the thesis contains no material previously published or written by another person except where due reference is made in the thesis itself.

Catherine Frances Drane

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Acknowledgement of Papers included in this Thesis

Included in this thesis are papers in *Chapters Three, Four and Five*, which are co-authored with other researchers. My contribution to each co-authored paper is outlined at the front of the relevant chapter. The bibliographic details for these papers including all authors, are:

Chapter Three: Drane, C.F., & Barber, B. L. (2015). Who gets more out of sport? The role of value and perceived ability in flow and identity-related experiences in adolescent sport. *Journal of Applied Developmental Science, 1-11*.

Chapter Four: Drane, C.F., & Barber, B. L. (under review). Binge drinking trajectories in high school athletes: The role of ability self-concept. *Journal of Applied Developmental Psychology*.

Chapter Five: Drane, C.F., Modecki, K.L., & Barber, B. L. (2017). Disentangling development of sensation seeking, risky peers, and binge drinking in adolescent sport. *Addictive Behaviors, 66*, 60-65.

Appropriate acknowledgements of those who contributed to the research but did not qualify as authors are included in each paper.

Signed _____(Date) 20/09/16
Catherine F Drane

(Countersigned) _____(Date) 20/09/16
Supervisor: Professor Bonnie L. Barber

(Countersigned) _____(Date) 20/09/16
Supervisor: Dr Kathryn L Modecki

1. CHAPTER ONE: Introduction and Overview

Leisure time is a major part of an adolescent's day, with many adolescents in Western countries, spending half their waking hours involved in discretionary leisure activities (Larson & Verma, 1999). Leisure activities can provide an environment that allows adolescents to experience both autonomy and self-directed development (Larson, 2000). The manner in which adolescents spend their free time is particularly important, as leisure time activities can play a salient role in the formation of identity, a primary task of adolescence (Erikson, 1968). Having a satisfying and meaningful life in the "after school" hours, in addition to life at home and school, is receiving increasing acknowledgement as being critical to healthy development (e.g., Eccles & Gootman, 2002).

Adolescents spend much of their out of school time involved in extracurricular activities. According to the National Longitudinal Study of Adolescent Health, 70% of students reported participating in at least one school-based activity (Feldman & Matjasko, 2005; Mahoney, Harris, & Eccles, 2006). The extensive literature outlining the role of extracurricular activities in development highlights the multiple worlds of adolescents, who are preparing for their transition to adulthood. It has become evident that extracurricular activities play a role in the development of real-world skills and aid in the connection of young people to the society in which they must live. School-based clubs and activities, sporting teams, churches, and community-based youth organizations provide young people with the experiences that help them integrate into adult society (e.g., Fletcher et al., 2000).

According to Larson, Hansen, & Moneta (2000), structured youth activities, which include extracurricular school activities and community-based activities, are contexts that provide adolescents with the conditions necessary to actively engage in

psychosocial growth (Larson et al., 2000). The evidence for the benefits of activity involvement is growing (Barber, Abbott, Blomfield, & Eccles, 2009; Feldman & Majasko, 2005; Marsh & Kleitman, 2002). Participation in organized extracurricular activities is positively associated with indicators of academic performance (Eccles & Barber, 1999; Eccles, Barber, & Stone, 2003; Fredricks & Eccles, 2006b), psychological adjustment (Barber, Eccles, & Stone, 2001; Fredricks & Eccles, 2006b; Marsh & Kleitman, 2002) and reduced antisocial behaviour (Durlak & Weissberg, 2007; Fredricks & Eccles, 2006b).

A great deal of previous activity research focused on comparing activity participants with non-participants (e.g., Barber, Eccles & Stone, 2001; Eccles & Barber, 1999; Fredricks & Eccles, 2006; Mahoney, 2000), treating participation as a dichotomous variable. This was an all or nothing approach to examining activities, treating the *participant group* as identical in their involvement, and not considering individual differences in activity participation (Bohnert, Fredricks & Randall, 2010). More recently, research has recognised the importance of measuring both the type of activity and its temporal components: breadth, intensity, and duration of extracurricular activity involvement (Feldman & Majasko, 2012). This research focuses specifically on sports participation, as it is the most common activity reported by Australian adolescents (Australian Bureau of Statistics, 2012). Given the prevalence of sport involvement in the daily lives of Australian youth, it is important to understand the role of sports participation in successful development and healthy adjustment.

There is extensive evidence for the positive role of extracurricular sports participation in adolescent development (Barber, Abbott, Blomfield, & Eccles, 2009; Feldman & Majasko, 2005; Marsh & Kleitman, 2002). Sport participation is associated with better academic performance (Eccles & Barber, 1999; Fredricks & Eccles, 2006),

emotional regulation, initiative, and teamwork (Larson, Hansen & Moneta, 2006). Sport also offers opportunities to develop values such as responsibility, conformity, persistence, courage, and self-control (Hansen & Larsen, 2007; Kleiber & Kirshnit, 1991). In contrast to these benefits, there are contradictory findings that sport and risky behaviour are associated, particularly, with alcohol use (Eccles & Barber, 1999; Modecki, Barber, & Eccles, 2014). Thus, sport is a context that can promote positive development, as well as potentially facilitate adolescent risk behaviour.

As a way of understanding the sports context, a great deal of research to date has focused on comparing sports participants with non-participants (Barber, Eccles & Stone, 2001; Eccles & Barber, 1999; Fredricks & Eccles, 2006; Mahoney, 2000), to answer the question - How do adolescents who play sport differ from adolescents who do not? As noted above, this previous research has provided valuable insight into the experiences gained by participating in sport. However not everyone who takes part in sport reports benefits, nor do all athletes follow a riskier path. To develop a more nuanced view of the sport context and explain diversity in experiences, understanding the dynamics between individual athlete attributes and the characteristics of the sport context is important.

Better understanding of variability among adolescent athletes is important for those who administer and deliver sporting programs, as well as for parents to aid their choices for investing resources and encouraging their children to participate. There is limited evidence for how personality and motivational characteristics of athletes are linked to indicators of positive development or risk across the high school years. Thus, this thesis adopts several approaches to the measurement of individual differences within the sport context, as a way of understanding how individual attributes of athletes

may promote positive experiences within the sports context for some adolescents and contribute to susceptibility to risk for others.

Adolescence is a unique developmental period characterized by numerous simultaneous changes. These include the biological, cognitive, and emotional changes associated with puberty, as well as the social and educational changes associated with the transition from primary school to high school (Eccles & Midgely, 1989; Eccles et al., 1993). During puberty, individuals increase their ability to think abstractly, recognize the hypothetical as well as the real, engage in more sophisticated information processing strategies, consider multi-faceted problems, and reflect on the self (Wigfield & Eccles, 2002). These changes can challenge an adolescent's evolving sense of self and offer opportunities for positive developmental experiences, such as identity exploration and social role definition (Eccles, Lord & Roeser, 1996).

Moreover, adolescence is a period when specific types of problems, such as involvement with risky behaviour, are more likely to arise than in any other period of development (Steinberg, 2004; 2007). Factors that may exacerbate this likelihood may be the changes that occur in both social and educational environments (Eccles et al., 1993). Some adolescents experience a trajectory of positive growth and adjustment, and for others the outcomes are more negative, including poor self-esteem, mental health issues, and risk behaviour (Eccles & Midgely, 1989; Eccles et al., 1993). However, the problematic behaviours that often delineate the period of adolescence are not inevitably a by-product of being an adolescent. Rather, one factor that contributes to problems is poor fit between the needs of adolescents and the environment in which they develop (Mahoney et al., 2009). With this in mind, it is clear that an adolescent's individual trajectory encompasses a unique developmental pathway, and this pathway is

determined by a complex interplay between the characteristics of the person and the features of their environment (Silbereisen & Lerner, 2007).

One environment where this dynamic plays out is in structured extracurricular sport activities. Extracurricular sport participation significantly affects social, educational, civic, and physical development (Durlak & Weissberg, 2007; Feldman & Matjasko, 2005; Fredricks & Eccles, 2006; Mahoney, Larson, Eccles, & Lord, 2005). To evaluate how participation in organized sport contributes to adolescent development, researchers have examined the role sport plays in the development of age-appropriate competencies (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Sports enable adolescents to socialize with their peers and with adults, establish and achieve personal goals, compete fairly, recover from defeat, and peaceably resolve disputes (Danish & Gullotta, 2000), and offers opportunities to experience flow (Jackson & Eklund, 2002; Jackson, Ford, Kimiecik, & Marsh, 1998). Acquiring these types of competencies through playing sport allows adolescents to tap into those inner resources that promote positive functioning (Eccles et al., 2003; Mahoney & Bergman, 2002; Mahoney et al., 2006), but the benefits may be differentially distributed among athletes, depending on their dispositions and motivations.

In contrast to the positive developmental outcomes associated with sport participation, there are conflicting findings that sport is potentially risky in relation to alcohol use (Eccles & Barber, 1999; Modecki, Barber, & Eccles, 2014). Specifically, there is growing evidence that links supervised, organised sport participation with problematic drinking (Busseri et al., 2010; Eccles, & Barber, 1999), in particular, binge drinking (Eccles & Barber, 1999; Modecki, Barber, & Eccles, 2014). More specifically, participation in extracurricular sport has been associated with increased binge drinking among adolescents throughout high school (Lisha, & Sussman, 2009; Mays, DePadilla,

Thompson, Kushner, & Windle, 2010; Wichstrom, & Wichstrom, 2009). However, research has not adequately identified the processes that explain this growth in problematic drinking among adolescent athletes. In order to identify these processes, it is important to look at the course of binge drinking among adolescent athletes longitudinally, and map trajectories of binge drinking along with constructs thought to either protect from or promote adolescent problematic drinking over time.

The conceptual frameworks that underpin this thesis include the Bio-ecological model of human development (Bronfenbrenner, 1995; Bronfenbrenner & Morris, 2006), the person-environment fit theory (see Hunt 1975), the stage-environment fit theory (Eccles & Midgley, 1989; Eccles et al., 1993), and the self-determination theory (Deci & Ryan, 1985). The bio-ecological model of human development is about the interactions between the individual and the environment (Bronfenbrenner & Morris, 2006). The model states that the form, power, content, and direction of the processes affecting development vary systematically as a joint function of the characteristics of the developing person, the environment in which the processes are happening, the developmental outcomes under consideration, and the changes occurring over the time period during which the processes are taking place (Bronfenbrenner & Morris, 2006). These proximal ecologies are assumed to have reciprocal and synergistic influences on developmental process so that the impact of one setting can only be understood with reference to the others, and these are likely to change over time (Bronfenbrenner & Morris, 2006).

As a developmental variant of the person-environment fit theory, Eccles and colleagues proposed the stage-environment fit model to understand the impact that the environment has on adolescent development. (Eccles et al., 1993). The person-environment fit theory concerns the degree to which characteristics of the individual and

the environment match or are congruent (Hunt, 1975). The stage-environment fit theory proposes that behaviour, motivation, and mental health are influenced by the fit between the needs of developing adolescents, the opportunities afforded to them in their social environments, and the congruence of these social environments (Eccles & Midgely, 1989; Eccles et al., 1993; Eccles, 2008). Adolescents whose psychological needs are not being met by their social environment are not likely to do well or be motivated. Furthermore, a lack of 'fit' can result in declines in motivation, interest, performance, and behaviour (Eccles & Midgely, 1989; Eccles et al., 1993; Eccles, 2008). Applying the person-environment fit theory specifically to the sporting arena suggests that a fit is required between the psychological needs of the individual and what the sporting environment has to offer, for growth and challenge to occur. This fit is contingent on individual characteristics of adolescent athletes within the sporting context.

An approach to human motivation and personality is Self-Determination theory (SDT). This theory has identified three basic psychological needs that enhance development, performance, and well-being: competence (Harter, 1978), relatedness (Baumeister & Leary, 1995), and autonomy (Deci, 1985). However, SDT is not just applicable to positive development but also to social environments that might undermine motivation, social functioning, and well-being.

SDT posits that sport activities can be both intrinsically and extrinsically motivated. Intrinsic motivation refers to an individual's capacity to apply and extend both skills and capabilities (Deci & Ryan, 2000). The proclivity to be active, to explore, and to challenge oneself allows a growing individual to adapt. The ability to adapt fosters competencies, and the capacity to cope with the demands of the physical environment (Deci & Ryan, 1985). Intrinsically motivated sport activities are experienced as fun and enjoyable. A fundamental reason why people engage in sports is

that they are interesting, challenging, and enjoyable (Frederick & Ryan, 1995). As sport activities involve a combination of both intrinsic and extrinsic motivations, it is likely that intrinsic motivations facilitate positive experiences in sport, such as flow, self-reflection and exploration.

Incorporating the bioecological systems theory, person/stage-environment fit perspective and self-determination theory provided guidance in selecting constructs to test under what conditions and for whom the sport context is developmentally optimal. Importantly, the intent of this thesis is not to substantiate these theories but rather illustrate how these theories have guided the thinking that underpins this research. The challenges associated with the developmental needs of an adolescent, coupled with their dynamic social contexts, brings opportunities for teenagers to embark on different developmental pathways (Eccles et al., 1996). For some this challenging period can promote positive growth and adjustment, for others, the challenges heighten vulnerabilities to involvement in risky and problem-type behaviours (Eccles, Lord & Roeser, 1996). Consistent with this perspective, adolescents whose environments are not developmentally suitable are more likely to experience difficulties or adverse outcomes, while those whose social conditions are responsive to their changing needs are more likely to experience positive outcomes (Eccles & Midgley, 1989; Eccles et al., 1993; Gutman & Eccles, 2007).

Chapter two. Chapter two presents an overarching review of the literature on adolescent extracurricular sport, establishing the broader context for the three empirical studies. Further, chapter two provides a detailed review of literature concerning the primary constructs of this thesis. This analysis supports the view that unique attributes among athletes have an impact on both positive and negative experiences in sport, and identifies gaps in the literature that informed this thesis.

Chapter three. The first empirical study (Chapter 3) of this thesis sought to establish whether there was a link between motivational beliefs of adolescents and developmental experiences in their sport. Although there are links between sport participation and positive experiences (Barber et al., 2009; Feldman & Majasko, 2005; Marsh & Kleitman, 2002), not all adolescents have positive experiences in sport. Having positive experiences in sport may require more than simply going through the motions of playing sport, such as a level of engagement and intrinsic motivation in sport. Therefore, the first aim of this thesis was to investigate whether the motivational beliefs of attainment value and ability self-concept explained differences in experiences of identity exploration, reflection, and flow for athletes. This study contributes to understanding how the unique attributes of adolescent athletes can determine how they perceive their experiences in sport.

Chapter four. The second empirical study (Chapter 4) investigated the longitudinal course of sport ability self-concept, depressed mood and binge drinking among athletes. Previous research has identified that in addition to many benefits, sport participation has been associated with increased binge drinking risk over time among adolescents (Lisha, & Sussman, 2009; Mays et al., 2010; Wichstrom, & Wichstrom, 2009). Research to date has only partially identified the processes that explain this growth in problematic drinking among adolescent athletes. For this reason, study two examines the degree to which sport ability self-concept and depressed mood influence the developmental course of binge drinking among athletes. Study two utilises multivariate latent growth curve modelling to link change in ability self-concept and depressed mood with change in binge drinking over time in the sport context. This approach provides a strong methodological as well as a substantive contribution to the field, as little prior research has identified individual attributes of the athlete that predict

differences in individual trajectories of binge drinking. As with study one, this study contributes to understanding how the unique attributes of adolescent athletes can influence their experiences in sport.

Chapter five. The third and final empirical study (Chapter 5) investigated the longitudinal impact of sensation seeking and association with risky peers on binge drinking in the sport context. As mentioned above, previous research has highlighted the association between sport participation and binge drinking risk for adolescents (Lisha, & Sussman, 2009; Mays et al., 2010; Wichstrom, & Wichstrom, 2009). Because sensation seeking and associating with risky peers may help explain accelerations in binge drinking, Study three utilises multivariate latent growth curve modelling to assess change in sensation seeking and risky peers in sport with change in binge drinking over time. This approach reveals whether individual differences, in this case, risk factors, increase in alignment with escalating binge drinking and whether early levels of risk predict subsequent binge drinking change among adolescents in extracurricular sports. Consistent with Study two, this approach offers substantial methodological as well as substantive contributions to the field, identifying unique attributes among adolescent athletes that determine experiences in sport.

Chapter six. Chapter 6 concludes with a general discussion, integrating the results of the three empirical studies and the potential implications of the findings.

The data collected for the three empirical studies were from a sample of Western Australian adolescents. The Youth Activity Participation Study of Western Australia (YAPS-WA) is a longitudinal research project that investigated leisure time experiences and well-being of Australian youth. YAPS-WA commenced in 2007 and concluded data collection in 2014. The YAPS project sampled students in 39 high schools, both metropolitan and regional school districts across Western Australia. Study 1 (Chapter 3)

utilized Wave 4 data (Year 9 and year 12 student cohorts), Study 2 (Chapter 4) used longitudinal data on one cohort from Wave 1 through to Wave 4 (Year 8 – Year 11). Study 3 (Chapter 5) also longitudinal, used data from Wave 1 to Wave 3 for one cohort (Year 8 – Year 10) (see Appendix A for a copy of the entire Wave 3 survey).

As this thesis is comprised of two published manuscripts, and one paper currently under peer review, each empirical chapter is structured as an independent study. Therefore, each empirical study (Chapters 3-5) is presented with its abstract, an introduction discussing relevant research, method, results section, and discussion. As a consequence of this structure, references are provided at the end of each chapter. Additionally, each empirical paper is prefaced by an overview of the purpose and rationale of the study in the context of the larger thesis.

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1. CHAPTER TWO: Literature Review

Who benefits from sport? Sport is a context that provides positive experiences for some adolescents but may lead to problematic outcomes for others. To gain a more nuanced understanding of the sport context, it is important to understand how differences among adolescent athletes might influence what they get out of sport. Furthermore, sustained participation over time may be differentially beneficial, or risky, depending on the individual characteristics of those engaged in sport. However, little is known about which adolescents are most likely to benefit from sport involvement, and which may be more vulnerable to risks.

Adolescents are agentic, that is, producers of their own development (Larson, 2000), developing the knowledge, skills, and values required for navigating this complex world. Adolescents are also subject to their environment, consistently adapting to different rules and values associated with their different contexts (Larson & Tran, 2014). This individual↔context relation is dynamic in nature, providing a base for congruence or incongruence, and resulting in variations in positive and negative outcomes of developmental change (Lerner & Lerner, 1989; 1883). Although sport is a context supportive of adolescent agency, that can facilitate adolescent development, we do not fully understand the dynamics of the sport context, and how processes experienced as part of sport participation may vary in their impact for individuals with different propensities and challenges.

Each adolescent athlete brings to the sport setting individual attributes, and these attributes likely help determine whether the sport context is more or less protective or risky. What determines adolescents' experiences and behavioural outcomes of participating in sport might be related to their individual characteristics and motivations, as well as to opportunities or barriers within the sport setting. It might be that some

individual attributes promote positive experiences while others undermine the potential for benefits.

This chapter provides a review and critique of the literature concerning the primary constructs of this thesis. Five major areas are covered. First, a review of the literature examining the role of extracurricular sport participation in adolescent development is provided. The sport context is defined, followed by an introduction to positive and negative experiences in sport and how they can be conceptualised within the person-environment fit framework. The second section examines sport and intrinsic motivation. Motivation is explained followed by a discussion of an expectancy-value approach to understanding motivation in sport. This section is further divided into two major motivation constructs: attainment value and self-concept, particularly with respect to the sport context. Third, two positive developmental experiences related to sport, identity formation and flow are considered, followed by the fourth section describing a major risk behaviour related to adolescent sport - binge drinking. The fifth and final section focuses on vulnerabilities to negative pathways for adolescents in sport, further separated into links between sport and risky peers, sensation seeking, and depressed mood. In addition, reviews of the literature pertinent to the specific empirical studies are provided in the introductions to Studies 1-3 in Chapters 3, 4, and 5.

Extracurricular Sport Participation

Evidence to date suggests that organised extracurricular activities are important contexts for adolescent development. Activity contexts have been shown to support the development of physical, psychosocial, cognitive, and educational functioning (Barber, Eccles, & Stone, 2001; Mahoney, Cairns, & Farmer, 2003; Marsh & Kleitman, 2002). Adolescents are more likely to participate in sport relative to any other type of extracurricular activity (Eccles & Barber, 1999; Feldman & Majasko, 2007; Zill, Nord

& Loomis, 1995). There is extensive evidence for the role of extracurricular sport participation in positive adolescent development (Barber, Abbott, Blomfield, & Eccles, 2009; Feldman & Majasko, 2005; Marsh & Kleitman, 2002), and participation is positively associated with indicators of academic performance (Eccles & Barber, 1999; Fredricks & Eccles, 2006), emotional regulation, initiative, and team work (Larson, Hansen & Moneta, 2006), and development of values such as responsibility, conformity, persistence, social cohesion, courage, and self-control (Hansen & Larsen, 2007; Kleiber & Kirshnit, 1991)

Extracurricular sport contexts are highly structured and can be formally defined as an “institutionalized competitive activity involving two or more opponents and stressing physical exertion by serious competitors, who represent or are part of formally organized associations” (Nixon, 1984, p.13). In Australia, sport is a central pastime, and 63.7% of adolescents, aged 12-14 years, participated in sport outside of school hours (Australian Bureau of Statistics, 2012). In order to evaluate how participation in organized sport contributes to adolescent development, researchers have been examining the role sport plays in the development of age-appropriate competencies (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Sports have been shown to support adolescents to socialize with their peers and with adults, establish and achieve personal goals, compete fairly, recover from defeat, and peaceably resolve disputes (Danish & Gullotta, 2000).

According to Smoll and Smith (2002), sport involvement builds character, imparts a respect for sport rules, endorses healthy competition and perseverance, and supports a sense of achievement. Acquiring these types of competencies through playing sport allows adolescents to tap into resources that promote positive functioning as well as reducing the risks of developing problem behaviour (Eccles, Barber, Stone, & Hunt,

2003; Mahoney & Bergman, 2002; Mahoney et al., 2006). Hansen and Larson (2007), found that compared with other activities, adolescents spent the most time in their sport activity, had more opportunities for leadership roles, and were in smaller groups, and these characteristics are known to amplify positive experiences.

Although extensive research has documented the relationship between participation in structured sport activities and positive adolescent development, a limitation of this literature has been the relative lack of empirical research concerning the processes underlying this positive relationship. As researchers begin to investigate these processes, they not only recognize the role sport plays as a context affording adolescents a range of developmental experiences, but also recognize development as complex. Therefore, developmental experiences can be considered as more than just a means for growth, but also as important in their own right. Developmental experiences can be considered key developmental milestones in adolescence which need to be achieved in preparation for adulthood. Understanding and articulating how these milestones are achieved is important.

However, there is evidence that sports involvement is not entirely positive but can be associated with negative outcomes. Links between sport involvement, adolescent development and emotional adjustment have been mixed. Sport involvement has been associated with delayed identity development (Larson and Kleiber, 1993), school deviancy (Lamborn, Brown, Mounts & Steinberg, 1992), higher rates of alcohol use (Eccles and Barber, 1999), anxiety and self-centeredness (Smoll and Smith, 2002), and bodily injury (Dane et al., 2004). In addition, Larson et al. (2006) found sports participation was associated with stress and social exclusion. Longitudinal studies have also shown that participating in sport can be associated with increased risk (Barber, Eccles, & Stone, 2001; Eccles & Barber, 1999; Fredricks & Eccles, 2006; Marsh &

Kleitman, 2002). Sports have been described as both character building and character challenging (Hansen, Larson, & Dworkin, 2003). When comparing sports to other extracurricular activities, this research showed that sports participants, predominantly reporting on team sports, reported similar rates of learning experiences in the area of team work and social skills relative to other activities, and also reported lower rates of learning prosocial norms. Furthermore, sports participants reported higher rates of negative peer interactions and inappropriate adult behaviour (Hansen et al., 2003). Hansen and colleagues suggest that these positive and negative experiences associated with sport participation may be due to the competitive nature of sport. On the one hand, there is a drive to excel in sport which is related to the development of self-knowledge and strategies for controlling emotions (Danish, Kleiber, & Hall, 1987). On the other hand, sport is a context for social comparison and rivalry with peers (Robert & Treasure, 1992), possibly a result of the increased competitiveness of sport, as positions within a team become limited (Brudstad, Babkes & Smith, 2001). Additionally, research has found that competitiveness can hinder athletes from taking the perspective of others, and impedes moral development (Bredemeier & Shields, 1996). Thus, the competitive nature of sport may encourage self-examination and character building but also limit the development of collaborative-type skills, exposing adolescent athletes to the negative experiences associated with sport participation and in doing so challenge their character (Hansen et al., 2003).

As mentioned above, the benefits of sport participation are well documented, nonetheless, not all adolescents have positive experiences. The question becomes why do some adolescents benefit from sport, whereas others do not? To understand the diversity of experiences in sport, individual attributes and differences need to be considered, including intrinsic mechanisms and motivations, person-level

characteristics, the broader context in which athletes are situated, and how individually or in combination they might influence both positive and negative outcomes. Positive development is not simply avoiding a negative developmental trajectory; it is also about providing opportunities for growth and challenge (Pittman, 1999). That is, positive development is not only about being devoid of problems, but rather about being prepared, reducing the chance of negative development, providing protection from risks, and offering opportunities for growth and life skills development (Pittman, 1999).

Eccles and colleagues have been instrumental in understanding how contexts can work to foster or undermine such motivation and well-being. Their framework has been articulated through a body of research centered on the stage-environment fit perspective. This perspective specifies that the fit between adolescents' developmental stage and their social environments affects developmental outcomes (Eccles & Midgley, 1989). Offering this fit in the context of adolescent sport requires the sport environment to manifest opportunities and structures consistent with adolescents' developmental needs. Conversely, adolescents cannot be expected to thrive in social environments that do not fit or meet their needs (Eccles et al., 1993). Therefore, it is important to examine the quality of the sport experience for adolescents, identifying both circumstances in which adolescents flourish and thrive (Theokas et al., 2005), and those that may prove problematic for adolescents. One notable gap in the research to date has been identifying the conditions underlying the diversity of experiences in sport. This thesis addresses this gap by examining individual attributes and contextual differences, such as adolescents' motivations, personality, and peers.

Sport and the Role of Intrinsic Motivation

Research on sport participation and motivation suggests that adolescents participate in sports for a number of different reasons, including fun, skill development,

challenge, and fitness (Klint & Weiss, 1987; Wankel & Kreisel, 1985). Furthermore, engagement in sport is driven by interest/enjoyment and competence motivation (Frederick & Ryan, 1993). According to Weiner (1992), “Motivation is the study of determinants of thought and action – it addresses why behaviour is initiated, persists, and stops, as well as what choices are made” (p2). One approach to studying motivation is the expectancy-value theory which posits that individuals’ choices, persistence, and performance can be explained by their beliefs about how well they will do in an activity and the extent to which they value an activity (Atkinson, 1957; Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992). Much of the research using expectancy-value theory has focused on gender differences in educational pathways (Guo, Parker, Marsh, & Morin, 2015; Watt, Eccles, & Durik, 2006; Watt et al., 2012). For example, research has focused on the interplay between academic achievement, math self-concept, and task value in predicting influence on school subject selection and educational and occupational aspirations (e.g., Simpkins, Davis-Kean, & Eccles, 2006; Wang, 2012; Watt et al., 2006, 2012; Wigfield, Tonks, & Kluda, 2009). That said, expectancy-value theory is also a useful framework for understanding motivations in sport, as participating in sport is also about choice, persistence, and performance.

According to Eccles (2009), individuals seek to confirm characteristics that are central to their self-image and identities, and different tasks will provide varying opportunities to confirm such characteristics. Individuals place more value on those tasks that are consistent with long-term goals. Therefore, people are more likely to select tasks that hold high subjective value compared to tasks with low subjective value. Thus, subjective task value, or a person’s personal beliefs about an activity, is task specific, and speaks to different qualities of specific tasks that may motivate an individual to perform the task (Wigfield & Cambria, 2010a). In all, the subjective task

value construct consists of four subcomponents; attainment value, intrinsic value, utility value, and cost (Eccles et al., 1983). This thesis focuses on one of these sub-components, attainment value, to characterize a key aspect of adolescents' motivations in sport.

Attainment Value

Attainment value is the importance of doing well on a task viewed as central to one's sense of self (Wigfield & Cambria, 2010a). Adolescence is an ideal period to investigate attainment value as it requires an individual to have developed a sense of self, which typically develops early in adolescence and is an important identity milestone of the adolescent period. According to Eccles (2009), a task that is valued because of interest can eventually become valued because of its importance or attainment value. Attainment value can be conceptualized in terms of personal and collective identities. Those parts of an individual's self-image that are central to self-definition should influence the value attached to it, and that value, in turn, should influence achievement-related choices. Eccles (2009) suggests that people perceive tasks in terms of particular features that can be related to their needs, values, and identities. A task, such as extracurricular sport, can thus provide opportunities to confirm possession of characteristics central to identity.

Sport and attainment value

Adolescents who identify as athletes will set goals related to their sport and are motivated to achieve these goals, which are central to their identity (Barber et al., 2005; Wigfield, 1994). The value placed on the sporting task or its outcome and the perceived likelihood of success will determine the level of effort exerted to complete the sporting task successfully (Eccles & Harold, 1991). There is a motivating potential that comes about when anticipating outcomes, which is largely determined by the subjective value

placed on its attainment (Bandura, 1997). Two people may have the same beliefs about the likely outcome of their behaviour but may evaluate the attractiveness of that outcome differently. The person who finds the outcome more attractive or values the outcome will be more motivated to attain it (Bandura, 1997). Furthermore, value may have the effect of compensating for low probabilities of success in sport. That is, an individual may expend effort in sport because they value the outcome or result, even when there is a low probability of success. This is one example of the influence that value has in determining sport behaviour (Wigfield, 1994). As stated by Wigfield: “When students value a task, they will be more likely to engage in it, expend more effort on it, and do better on it” (Wigfield, 1994, p. 102).

Adolescents will choose sports that are compatible with their self-perceptions and avoid sports that are inconsistent with these self-perceptions (Eccles (Parsons), 1983). Illustratively, when athletes perceive their sport as requiring a specific skill and they want to confirm that they have this skill, then both the attainment value of the sport and the likelihood of selecting this sport, increases (Eccles & Harold, 1991). Thus, adolescents are more likely to select a sport they value than a sport that is not important to them. There may be numerous individual and social reasons influencing an adolescent’s perceived value of sport. Adolescents with low sport value may be influenced more by external motivations and pressures to participate, undermining intrinsic motivations to play sport. Investigating adolescents’ attainment value can thus strengthen our understanding of how they develop motivational values in sport.

However, the premise underlying the expectancy value theory is that activity choice, persistence and performance are not only explained by motivational values but also by self-beliefs about competence and ability (Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992). Therefore, this thesis not only examines the importance of

understanding how value, such as attainment value may influence motivations in sport, but also examines the role self-beliefs or self-concepts of ability may play in sport motivations and engagement.

Self-concept

Self-concept can be broadly defined as an individual's perceptions of self, formed through both their experiences with, and interpretations of, the environment (Shavelson et al., 1976). Self-perceptions are influenced by evaluations and reinforcements from significant others, as well as attributions of one's own behaviour. Self-concept can both explain and predict how a person acts, is multifaceted, and is an ordered hierarchical construct (see Marsh & Shavelson, 1985 for a review). The apex of this hierarchy is a general or global evaluation of the self that reflects an individual's attitudes towards the self as a whole. The domains of self-concept form the subsequent tiers of the hierarchy: academic, social, behavioural, physical appearance, athletic, romantic, and occupational self-concepts (Shavelson et al., 1976). Subsequent research has suggested a revised model, with academic self-concept being further divided into verbal/academic and math/academic self-concepts rather than a single factor (Marsh, Byrne, & Shavelson, 1988; Marsh & Shavelson, 1985).

During preadolescent years, self-concept appears to become more differentiated. During early adolescence, self-competence beliefs also decline (Cole et al., 2001; Fredricks & Eccles, 2002). This decline may be attributed to childhood self-concept being overly-high, so that during pre-adolescence, self-concepts becomes increasingly realistic. Thus adolescent self-concept may more accurately reflect the influence of external sources of information about self (Harter, 2012; Horn, 2004). This external feedback from others is particularly important throughout adolescence, when the

appraisals of others take a central role in the development of self-perceptions (Harter, 2012; Horn, 2004).

Particular subtypes of self-concept may be particularly salient to wellbeing during adolescence, compared to childhood. For example, physical self-concept has been linked with general self-esteem in adolescence (Harter, 1990). Once children reach adolescence, their physical competence and physical appearance self-concepts become important to their well-being (Harter, 1990). Adolescents become increasingly self-critical about their physical competence and acceptance or rejection from their peers can impact their self-esteem greatly. As physical competence plays such an important role in motivations in sport, this thesis focuses on ability self-concept in the context of sport.

Sport and ability self-concept

Ability beliefs play a considerable part in many motivation and self-concept theories but point to different roles of motivation in self-concept. For example, Weiner (1985), as part of his attribution theory, suggested that ability self-perceptions are a fairly stable characteristic. He argued that attributing success to ability has positive motivational consequences, but that attributing failure to ability has negative consequences. As another example, Covington (1992), in his self-worth model, suggested that a positive perceived ability is closely linked with self-worth, and he also regarded perceived ability as a relatively stable capacity. However, researchers have examined age differences in children's ability perceptions and have found that younger children have more positive ability perceptions than older children (Eccles, Midgley & Adler, 1984).

When considering motivations in sport, competence and ability belief play a crucial role. For example, the expectancy-value theory proposes that an individual's activity choice, persistence, and overall performance in sport can be explained by their

beliefs about competence and value for sport (Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992). Eccles defined such ability beliefs or self-concept as an individual's perceptions of their present competence in a given activity (Eccles et al., 1983). Rather than finding these beliefs to be stable, Fredricks and Eccles (2002) found that sports competence beliefs declined over the course of schooling.

Possible explanations for declines in sport ability self-concept include the developmental changes that occur throughout adolescence. Developmental changes associated with the onset of puberty result in physical changes that can alter performance and ultimately beliefs about competence. Another typical developmental change involves engaging in social comparisons with peers and critical self-evaluations of abilities. In other words, adolescents become better at understanding and interpreting feedback from others and assessing their own skills by comparing themselves with others as well as with their own performance across other domains. Further, self-concept not only depends on the evaluations of one's own strength and weaknesses and the social comparisons made, but also on the frame of reference used to make such self-evaluations and comparisons (Marsh and Peart, 1988). In addition, the increased competitiveness of the sport environment, in particular the competitiveness of the selection process, can also result in declines in ability self-concept over the high school years (Fredricks and Eccles, 2002; Wigfield & Eccles, 2000).

Although sport ability beliefs have been shown to decline over adolescence, some researchers have documented contradictory findings for age differences in sport beliefs for younger children. Some have reported declines in children's perceptions of their physical abilities (Marsh, 1989; Marsh, Barnes, Cairns, & Tidman, 1984), whereas others have found no age differences in self-perceptions in the upper elementary school years relative to lower elementary school years (Eccles, Wigfield, Harold, &

Blumenfeld, 1993). However, the majority of this research has examined mean level differences in sport beliefs and has not assessed individual differences in developmental trajectories. Thus, it is important to understand normative patterns of self-concept development during adolescence, as well as individual differences in the course of self-concept over time. Drawing from previous research, adolescents with low or declining sport ability self-concepts are less likely to be motivated in sport, with decreases in effort, persistence, cognitive engagement, and achievement (Eccles, Wigfield, & Schiefele, 1997). Further, low ability self-concept reported by a student who participates in organized sport may indicate different motives for playing sport, such as hanging out with friends. These athletes may be less engaged in their sport and more vulnerable to risky experiences in sport driven by risk-taking fellow athletes.

The relationship between sport participation and positive or risky outcomes may be linked to individual differences in sport ability self-concept. An adolescent characterised by a high sport ability self-concept may be afforded positive affirming experiences in the sport context, whereas an adolescent with low ability self-concept may be vulnerable to seeking validation through involvement in risk taking. It is important that research considers intra-individual variability and change in sport ability self-concept as well as its associated change with other developmentally important variables.

Positive Developmental Experiences in Sport

A body of prior research has shown that activities are related to a range of positive developmental experiences (Fraser-Thomas & Cote, 2009; Hansen & Larson, 2007; Hansen et al., 2003; Larson, 2000). Broad examples of these experiences include personal development, teamwork and social skills, interpersonal relationships, and supportive adult networks. Typically, developmental experiences refer to the learning

experiences, strengths, or skills young people acquire by taking part in activities.

Because a primary task of adolescence is forming an identity, and experiencing flow is arguably connected to this process, this thesis examines the positive developmental experiences of identity formation and flow in adolescent sport.

Identity related experiences in sport

One of the most fundamental developmental tasks of adolescence is the formation of a personal identity (Erikson, 1972). The term identity refers to goals, values, and beliefs, group memberships, and roles played in society (Vignoles, Swartz, & Luyckx, 2011). Forming a cohesive identity is related to social and psychological well-being and lower rates of problem behaviour (De Haan & MacDermid, 1999; Jones & Hartmann, 1988; Jones, Hartman, Grochowski, & Glider, 1989; Waterman, 1992). Apart from being a life-long process, identity formation can pass through an intense phase during adolescence. Formation of a cohesive identity involves exploring the various aspects of identity; these explorations then culminate into commitments that set the foundation for adult life (Sharp et al., 2007). If this exploratory process is successful, the adolescent emerges more individuated with an understanding of who they are and how they fit into the world (Erikson, 1968; Sharp, Coatsworth, Darling, Cumsille, & Ranieri, 2007).

Research on identity development has recognized the role organized activity participation plays in identity formation (Barber, Stone, & Eccles, 2005a; Barber, Stone, Hunt, & Eccles, 2005b; Hansen et al., 2003; Larson, 2000; Waterman, 1990; Youniss & Yates, 1997). Some activities are more likely to promote identity formation than others and these activities are described as having high attainment value (Eccles, Barber, Stone, & Hunt, 2003). Participation in extracurricular activities stimulates an individual to evaluate their own interests, talents and values, as well as their place in the social structure (Eccles et al., 2003; Youniss & Yates, 1997). In addition, it has been suggested

that the relatively fixed structure of the school academic environment does not provide adequate freedom to explore and express identity alternatives, and to find developmental opportunities. In comparison, extracurricular activities can provide the freedom for personal development through identity-related reflection and exploration (Barber et al., 2001; Eccles et al., 2003). Extracurricular sport activities provide this freedom by offering adolescents opportunities to experience autonomy, exert control, and become active agents in their own development (Larson, 2000). Research findings on identity formation in sports has been mixed. When comparing sports participants with participants in other extracurricular activities, sports participants reported significantly lower rates of identity work than did adolescents in other activities (Hansen et al., 2003; Larson et al., 2006). However, research comparing sport with academic classes finds that adolescents athletes were more likely to comment that sporting activities, “got me thinking about who I am” than were students commenting on their academic classes (Hansen et al., 2003).

Sports provide a means through which an individual’s identity can be expressed and refined (Eccles, 1987; Eccles & Barber, 1999). That is, sports represent physical and mental challenges and offer an identity based on a sense of competence and/or identification with a social group (Shaw, Kleiber, & Caldwell, 1995, p.247). Importantly, Waterman (1984) suggests that as part of identity exploration adolescents try out different activities, such as sport. When an activity supports the self-concept of an adolescent, it is also likely to cultivate psychological well-being as well as attachment to the context providing the opportunities (Eccles et al., 2003; Waterman, 1984). Likewise, when such opportunities are unavailable to an individual, or there is a bad match to their interests, then there is a lack of support for identity exploration and affirmation (Eccles et al., 2003; Waterman, 1984). Thus sport provides potential

opportunities for identity exploration for adolescents whose motivations are well aligned to sport.

Participating in sport provides a good example of the strong connections between identity exploration and attainment value. Adolescents who participate in sport have the opportunity to demonstrate that they are athletes, and explore whether being an athlete is an identity that is meaningful to them (Barber et al., 2005a; 2005b; Eccles et al., 2003). An adolescent's decision to participate in sport should be influenced by the high value or importance placed on being an athlete (Barber et al., 2005a; 2005b; Eccles et al., 2003). Once adolescents are engaged in sport then their identity as an athlete should be internalized as a result (Eccles et al., 2003). However, not all sports that adolescents engage in will facilitate identity formation (Barber et al., 2005a; 2005b; Eccles & Barber, 1999). Sports that are voluntary or self-selected encourage self-assessment and clarification of motivations, and therefore may provide a greater fit with interests and talents, and have higher attainment value (Barber et al., 2005a; 2005b; Eccles & Barber, 1999). To an adolescent who identifies sport as matching their personal goals and talents, and having high attainment value, sport becomes self-defining (Eccles & Barber, 1999; Fredricks et al., 2002). In other words, sport represents who they are or who they would like to be and becomes core to forming both their social and personal identities (Barber et al., 2005a; 2005b).

In summary, adolescents choose to play sport because it reflects core aspects of self-beliefs, which then reinforces the way they think about themselves and their behaviour, facilitating the identity formation process (Barber et al., 2009). Other experiences shown to support this identity formation process include experiences of personal expressiveness, flow, and goal-directed behaviour, and higher levels of these experiences are associated with happiness (Waterman, 1993). As participating in sport

has been linked to flow experiences, it is important to examine these links in the context of adolescent sport.

Sport and the Optimal Experience of Flow

As well as supporting identity related experiences, sport also offers opportunities to experience flow. The term flow was introduced by Csikszentmihalyi (1975, 1988) and refers to how individuals feel when they are fully engaged in a situation. Flow was originally known as *optimal experience* because it described a deep sense of enjoyment and exhilaration. Informally, the process of the optimal experience became known as “flow”, because it expressed the feeling of fluidity and continuity in concentration and action reported by many participants in the context of qualitative research (Csikszentmihalyi, & Csikszentmihalyi, 1988; Csikszentmihalyi, & LeFevre, 1989; Csikszentmihalyi, 1990). Flow experience captures complete absorption in the moment with no spare attention for anything else. Flow occurs most often when there is an appropriate match between an individual’s abilities and skills and the challenges provided by the situation. Perceived challenges that stretch an individual’s skills, with clear reachable goals and immediate feedback on progress are conditions conducive to flow. Flow can take place in any situation, and is characterized by intense and focused concentration in the present moment, a merging of action and awareness, an expanded sense of time, loss of reflective self-consciousness, a sense of control of one’s actions; and lastly, characterized as being intrinsically rewarding without requiring external rewards to maintain behaviour (Csikszentmihalyi, 1997; Csikszentmihalyi, & Kleiber, 1991). Based on the Quadrant Model of the Flow State, when skill exceeds challenge, boredom results; when challenge exceeds skills, anxiety results; when both challenge and skill are low, apathy results (Csikszentmihalyi, & LeFevre, 1989); and finally when

challenge and skills are both high, the result is flow (Csikszentmihalyi, 1988; Csikszentmihalyi, & LeFevre, 1989).

Flow experiences are intrinsically motivating and youth report finding flow to be deeply involving and enjoyable while at the same time absorbing their concentration (Csikszentmihalyi, 1988). The theoretical notion of flow is well-aligned to the person-environment fit theory because it incorporates pursuits that provide a balance or fit between challenges/demands of the environment and the skills/resources of the individual (Csikszentmihalyi, 1988). This combination of psychological experiences is particularly well suited for learning, growth, and skill acquisition (Larson, 2000). As such, flow experiences are proposed to be particularly effective in facilitating developmental processes, such as identity formation (Larson et al., 2006). Notably, Larson's research on organized out-of-school settings suggests that, relative to other settings, organized activities such as sport are effective in fostering experiences conducive to flow (Larson, 2000). The experience of flow is a reward in itself that ensures that individuals will seek to increase their competence. The repeated experience of flow is only possible when individuals seek out increasingly challenging tasks and expand their competencies to meet these challenges (Csikszentmihalyi, 1988).

Research supports evidence for the potential of flow in sport (e.g., Jackson & Roberts, 1992; Jackson, 1995; 1996; Jackson & Eklund, 2002; Jackson et al., 1998; Jackson & Marsh, 1996; Kimiecik & Stein, 1992). As high skill and high challenge are at the core of the flow experience, flow is highly relevant to sport. As a result, a substantial amount of research has focused on elite athletes and the role of flow in high sport performance (Jackson & Roberts, 1992; Jackson 1995; 1996; Jackson & Eklund, 2002; Jackson, Ford, Kimiecik, & Marsh, 1998; Jackson & Marsh, 1996; Kimiecik & Stein, 1992). Sport is structured in a manner highly conducive to flow; training sessions

improve skill levels and competition maximises challenge. Thus, the sport context has the potential to provide the optimal conditions for flow, including challenge-skill balance, with clear goals and clear feedback. For instance, Stein, Kimiecik, Daniels, and Jackson (1995) studied flow in a recreational sport context, rather than an elite athlete context, and found support for non-elite athletes experiencing flow. This flow experience in sport may have a number of positive consequences.

Flow has been associated with elevations in well-being (Haworth, 1993), self-concept (Jackson et al., 2001), positive subjective experience (Csikszentmihalyi, 1975, 2002) and objective performance (Jackson & Roberts, 1992). In fact, Schuler and Brunner (2009) suggest that experiencing flow in a physical activity, such as sport, may contribute to long-term persistence in a sport activity as individuals rewarded by flow are likely to want to repeat it. In this sense, the intrinsically motivating attributes of flow may contribute to both short and long-term psychological well-being and health benefits, as well as influence future motivations to play sport (Elbe, Strahler, Krstrup, Wikman, & Shelter, 2010).

Although the characteristics of flow itself have been examined fairly extensively, factors that predict flow are less clearly understood. There is an assumption, based on flow theory, that there are individual differences in the frequency and intensity to which people can experience flow. These include individual differences based on aspects of personality (the autotelic personality) and differences based on motivation (perceived ability). Individuals with an autotelic personality are expected to experience flow more than others (Csikszentmihalyi, 1990, 1993). The term autotelic is derived from auto (self), and telos (goal). An individual with an autotelic personality does things for their own sake, rather than for external goals (Csikszentmihalyi, 1997). Thus, individuals with an autotelic personality may be better equipped psychologically to experience flow

(Jackson et al., 1998). But personality is not the only facilitator of flow, because the fit or the context to one's aptitudes help to align the challenge-skill balance.

In that way, a key individual difference predicting flow is perceived ability (Duda, 1993; Jackson & Roberts, 1992; Duda & Nicholls, 1992). Jackson and Roberts (1992) stated that a focus on perceived ability stems from the flow model which states that "it is not the skills we actually have that determine how we feel, but the ones we think we have" (Csikszentmihalyi, 1990, 1975). Indeed, according to Jackson and colleagues, high perceived ability is associated with flow and may be a necessary precondition for flow states (Jackson et al., 1998). To support this suggestion, Jackson et al. (2001) examined 236 athletes from three different competitive sports, (ages 16-to 73 years, mean age = 30 years) and found that athletic self-concept was related to flow, further confirming the association between self-perceptions and flow in a predominately adult sample. However, links between flow and sport performance have mostly been shown in exploratory research using qualitative approaches (e.g., Chavez, 2008; Jackson & Roberts, 1992; Jackson, 1995, 1996), focusing on elite athletes, primarily with adults. Far less research has examined flow in adolescent sport populations. Indeed, a noted gap in the literature to date is the lack of research targeting perceived sport ability and flow among adolescents (Chavez, 2008; Jackson, 1992, 1995, 1996).

Research addressing this gap in the understanding the role of perceived sport ability in flow is important, because not only does experiencing flow in sport enhance sport performance, but also according to Csikszentmihalyi (1990; 1997), being in flow can make our lives happy and successful. In this sense, flow influences the quality of the experience in sport, and is important for adolescent psychological well-being and adjustment. As the period of adolescence is a time for discovering who one is and who one wants to be, experiencing flow in sport may also reinforce core beliefs about the

self. Furthermore, adolescents who experience flow will seek to repeat the experience, as it is intrinsically rewarding. Therefore, experiencing flow may be a key motivator for adolescents persisting in sport over the long-term. With this in mind, it is important to recognise conditions that are conducive to experiencing flow in sport among adolescent athletes.

Risk Behaviour in Sport

Although there are many positive developmental experiences associated with sport as outlined above, participation in sport is also linked to certain negative indicators. In particular, sport has been associated with adolescent risk behaviour, such as alcohol use (Eccles & Barber, 1999; Modecki, Barber, & Eccles, 2014), including problematic alcohol use, (Busseri et al., 2010; Eccles, & Barber, 1999). This link is important, as the pervasiveness of underage drinking has led to decades of findings on the negative consequences of adolescent alcohol use. Indeed, rates of alcohol consumption increase dramatically during adolescence (Johnston, O'Malley, Bachman & Schulenberg, 2009), and research suggests that this vulnerability for heavy alcohol use may be influenced by changes that occur during puberty, including changes to the brain, as well as changes in social and contextual factors (Petit et al., 2013). Thus, adolescence is a particularly salient time for increases in alcohol use, especially when adolescents are transitioning to high school, and sport may offer the context that facilitates alcohol use.

Binge drinking

As described above, problem alcohol use or binge drinking (consumption of 5 or more alcoholic drinks on one occasion) is highly prevalent among adolescents (Currie et al., 2004; Hibell et al., 2004; Kuntsche, Rehm & Gmel, 2004). Binge drinking generally increases throughout adolescence and has strong links with later alcohol related

problems (Chassin, Prost, & Pitts, 2002; Kwan, Cairney, Faulkner, & Pullenayegum, 2012). In Europe, 15- to 16-year-olds reported drinking an average of six drinks on their last drinking occasion (Hibell et al., 2004) with 39 percent reporting binge drinking in the past month (Hibell et al., 2012). In the United States, 21 percent of adolescents reported binge drinking in the last 30 days (Centres for Disease Control and Prevention, 2014), and in Australia, 16 percent of adolescents reported binge drinking on a monthly basis (Australian Institute of Health and Welfare, 2014). The prevalence of binge drinking here and around the world points to a need for better understanding of the forces that drive high rates of alcohol misuse. Although adolescents tend to be vulnerable to binge drinking in general, certain contexts can also exacerbate this vulnerability. One context in particular that has been shown to increase risk is extracurricular sport participation (Lisha, & Sussman, 2009; Mays, DePadilla, Thompson, Kushner, & Windle, 2010; Wichstrom, & Wichstrom, 2009). This increased risk is because sporting contexts tend to include more risk-taking (e.g. binge drinking) peers, and because youth who are attracted to sport are themselves often high on sensation seeking. Both of these characteristics are also risk factors for binge drinking. Thus, an examination of the link between sensation seeking, peers and adolescent binge drinking in sport is highly informative.

Sport and binge drinking

The link between sport and increased alcohol use is fairly robust (Barber et al., 2001; Peck, Vida, & Eccles, 2008). For example, a body of prior research on alcohol consumption among high school sports participants found that athletes reported higher levels of alcohol use than did non-athletes (Dawkins, Williams, & Guilbault, 2006; Lisha & Sussman, 2010; Mays & Thompson, 2009; Moore & Werch, 2005; Naylor, Gardner, & Zaichkowsky, 2001; Peretti-Watel, Beck, & Legleyel, 2002). In fact, one

systematic review of 17 longitudinal studies linking sport participation and alcohol use among adolescents and young adults found that 80% of studies found a positive relationship between sport participation and alcohol use. Most importantly, they did not find any longitudinal studies that showing a protective effect of sport participation on alcohol use (Kwan, Bobko, Faulkner, Donnelly, & Cairney, 2014).

Several studies have further demonstrated longitudinal associations between sport participation over time and alcohol use over time. Illustratively, Mays et al., (2010) applied latent growth analyses to model associations between participation in school-based sports with initial levels and change in problem alcohol use over three years. Results revealed that sports participation was associated with quicker accelerations in problem alcohol use. Further, Lisha, Crano & Delucchi (2014) applied parallel-process latent growth curve analyses to model alcohol and marijuana use (vs. non-use) among sports participants. Results revealed that participating in a competitive sports team was related to lower probabilities of marijuana initiation but increased rates of alcohol use over time. However, a key limitation of this study was the use of dichotomous measures of substance use, rather than continuous measures. Therefore, rather than assessing growth in substance use this work showed that sport is associated with *movement* from non-use of alcohol to use (Lisha et al., 2014). Further research is required to examine links between adolescent sport participation and changes in substance use, including binge drinking. Such research should ideally focus on further identification of personal and contextual features of the sport environment that contribute to binge drinking acceleration.

As described above, although research has investigated the association between sport participation and problematic drinking, a number of gaps remain. Specifically, although we have a good understanding of the link between sport participation and

adolescent alcohol use, less is known about factors associated with this link, including factors associated with change in problematic drinking.

Sport participation and vulnerabilities to negative pathways

For some adolescents, sport participation may make them vulnerable to negative developmental pathways, including increased likelihood of and escalation in binge drinking.. Factors that may exacerbate this vulnerability include characteristics of the sport environment itself, such as risky peers and also individual attributes of adolescent athletes, themselves, such as personality. Thus, it is important to examine both of these factors in relation to adolescent binge drinking in sport.

Sport and Risky Peer Networks

Extracurricular sport is a context that can influence friend selection and link adolescents to certain types of peers, including peers that are prosocial or risky. Indeed, the sport context offers opportunities to develop friendships, discuss shared goals, and mutually reinforce some of the norms tied up in sport culture (Youness & Smollar, 1985). Spending time with friends is regarded as a central force driving adolescents to join, persist in, and leave activities such as sport (Denault & Poulin, 2009; Fredricks, Hackett, & Bregman, 2010; Hirsch, 2005; Persson, Kerr, & Stattin, 2007; Simpkins, Vest, Delgado, & Price, 2012). Further, participating in sport helps adolescents maintain and develop peer friendships (Schaefer, Simpkins, Vest, & Price, 2001). Thus the peer relationship aspect of sport is likely of central importance to those who participate.

During adolescence, it is typical to spend more time with friends and less time interacting with the family (Csikszentmihalyi & Larson, 1984). Peers become increasingly important, as youth become independent of parental control (Brown, Dolcini, & Leventhal, 1997). Peers thus play an influential role in shaping adolescents' values and behaviours, and become a key reference group for the developing adolescent.

Adolescents' increased need for social acceptance means that peer groups exert influence on each individual member (Eccles & Barber, 1999; Larson & Richards, 1991; Youniss, Yates & Su, 1997). Peers can provide a positive influence, as in the case of certain activity settings such as community service or academic clubs, in which peer norms tend to be prosocial. However, in the sport environment, peer norms tend to be less positive, and have been associated with substance use.

Certainly, social norms are a powerful source of influence on behaviour (Berkowitz, 1997; Cialdini, Reno, & Kallgren, 1990; Fishbein & Ajzen, 1975). The term *social norm* is often used to describe two different types of social influence: injunctive and descriptive norms. Injunctive norms are behaviours which are perceived as being approved of by other people, whereas descriptive norms are perceptions of how other people are actually behaving, regardless of approval. In relation to adolescent peer networks, injunctive norms refer to the approval of a particular behaviour within the peer group, that is, the perceived moral rules of the peer group. Descriptive norms, on the other hand, refer to the perceived behaviour of peers (Borsari & Carey, 2003). Perceived norms strongly influence adolescent behaviour, especially when peer social acceptance is paramount. Especially salient in the context of adolescent sport, descriptive norms tend to be important predictors of adolescent risk behaviour (D'Amico & McCarthy, 2006).

In general, adolescents' descriptive norms related to peer alcohol use are tend to be exaggerated, with adolescents overestimating the prevalence and approval of alcohol consumption amongst their friends (Baer and Carney, 1993; Baer, Stacey, & Larimer, 1991; Perkins, Meilman, Leichliter, Cashin, & Presley, 1999). For instance, Baer and colleagues found that students reported normative drinking rates higher than their own, and also higher than they actually were when measured independently (Baer and

Carney, 1993; Baer et al., 1991). This disparity in drinking perceptions has been extensively replicated, including studies using large samples, and assessing ratings of alcohol and other substance use (Perkins et al., 1999). Likewise, injunctive norms related to adolescent alcohol use, which are based on the groups' approval of drinking, also tend to be misperceived. Adolescents tend to rate peers as more accepting of alcohol use than they are actually (DeMartini et al., 2013; LaBrie, Napper, & Ghaidarov, 2012).

Further, adolescent's perceptions of peers' alcohol consumption are a strong predictor of alcohol consumption, even more so than peers' actual alcohol consumption (see Bosari & Carey, 2001). In all likelihood, adolescents emulate such risk behaviour that is perceived to be valued by their peer group, as a means of fitting in (Prinstein & Wang, 2005). Illustratively, there is evidence that exaggerated perceived norms of peer drinking are a significant individual risk factor for heavy drinking or binge drinking (Perkins and Wechsler, 1996; Thombs, Wolcott, & Farkash, 1997; Wood, Nagoshi, & Dennis, 1992). In this sense, peer groups can shape individual adolescent drinking behaviour by influencing one another's perceptions of drinking (Leung, Toumbourou, & Hemphill, 2014).

As noted above, peers strongly influence adolescent behaviour, and adolescents who have friends who engage in risky behavior are more likely to engage in such behaviours themselves (Dishion & Medici Skaggs, 2000; Hawkins, Catalano, & Miller, 1992; Hops, Davis, & Lewin, 1999; Patterson, Dishion, & Yoerger, 2000). However, it is difficult to ascertain the direction of such peer influence, whether adolescents prone to risk taking select friends who are similar to themselves - selection effects (Aseltine, 1995; Cohen, 1977; Ennett & Bauman, 1994; Fischer & Bauman, 1988; Wang, Eddy, & Fitzhugh, 2000), or whether these adolescents are socialized by their risky peers,

altering their own behaviour to align with that of their risk taking peers - socialisation effect (e.g., Kandel 1978; Keenan, Loeber, Zhang, Stouthamer-Loeber, & Van Kammen, 1995). Regardless of the direction of influence, there are parallel links between risky peers and negative adolescent behaviours, including binge drinking, and this thesis assessed the role of risky peers in sport as one factor that may serve to exacerbate adolescent risk.

Sensation Seeking

In addition to the role of risky peers, individual attributes may also help to explain overall high rates of binge drinking in adolescent sport, and why some adolescent athletes report higher levels of risky drinking than others. As one example, sensation seeking is a personality trait that is associated with sport participation and which may also contribute to higher levels of binge drinking among athletes. Zuckerman (1994) defines this trait as “the seeking of varied, novel, complex, and intense situations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience” (Zuckerman 1994, p26). Thus, sensation seekers have a tendency to engage in behaviours, activities, and attitudes that will increase the amount of stimulation they experience (Arnett, 1991; Irwin & Millstien, 1986; Zuckerman, 1985, 1994; Zuckerman & Neeb, 1980). According to Zuckerman’s definition of sensation seeking, these sensations and experiences carry a certain amount of risk (Zuckerman, 1994).

Importantly, sensation seeking individuals do not seek out risk for the purpose of risk itself, but rather they tend to underestimate the risk involved or accept the risk as the price to pay for the reward of the sensation itself. The idea is that there is a willingness to take risks for the sake of the experience. In other words, the rewards gained from the experience or sensation far outweighs the possible punishment for

engaging in risky activities (Roberti, 2004). Adolescent sensation seekers may be attracted to sport because of the thrill. They may also be drawn to engaging in risk behaviour, such as binge drinking, because the rewards associated with binge drinking with sport peers outweighs the punishment.

Sport and sensation seeking

Indeed, research shows that adolescents who participate in sports tend to be higher in sensation seeking than adolescents who participate in non-sport activities or who do not participate in extracurricular activities at all (Zuckerman, 1994). Although sensation seekers are attracted to sport, sport is considered a non-risky, socially acceptable choice for sensation seekers to obtain stimulation, especially in relation to other riskier sensation-providing options, such as alcohol use (Roberti, 2004). However, it is likely that some sensation seeking athletes remain tempted to engage in risky behaviour to satisfy their sensation seeking tendencies.

Sensation seeking and risk.

For high sensation seeking individuals, including adolescent sport participants, an absence of a stimulating environment can lead to boredom (Kass & Vodanovich, 1990), and this boredom can lead to engaging in risk behaviour, in particular alcohol use (Cohen & Fromme, 2002; Zuckerman, 1994). Some research suggests that relative to low sensation seekers, high sensation seekers appraise or interpret life differently (Franken, Gibson, & Rowland, 1992; Horvath & Zuckerman, 1993). Low sensation seekers appraise risky or stressful situations as threatening, resulting in negative consequences, whereas high sensation seekers do not. They simply do not view the world as threatening, dangerous, or risky (Franken et al., 1992; Zuckerman, 1994).

In general, a body of research has demonstrated links between sensation seeking and risk behaviour (Crawford, Pentz, Chou, Li, & Dwyer, 2003; Kuntsche, Knibble,

Gmel, & Engels, 2006; Quinn & Paige Harden, 2013; Quinn, Stappenbeck, & Fromme, 2011. For example, longitudinal research using latent growth curve analyses has examined associations between sensation seeking and alcohol use (Crawford et al., 2003; Harden & Tucker-Drob, 2011; Quinn & Harden, 2013; Quinn et al., 2011) and showed that sensation seeking had strong predictive value for alcohol use. Further, research using parallel latent growth curves tested whether the development of sensation seeking in middle school would predict development of substance use (cigarettes, alcohol, and marijuana) in middle school and high school. These results showed that sensation seeking had strong predictive value for both concurrent and distal marijuana and alcohol use in two different large samples of adolescents (Crawford et al., 2003). In addition, one meta-analysis based on 61 research studies showed that high sensation seekers consistently consume more alcohol than low sensation seekers (Hittner & Swickert, 2006). This research, and other similar findings, have provided the basis for sensation seeking as a key individual predictor of adolescent alcohol use (Crawford et al., 2003; Quinn & Paige Harden, 2013; Quinn et al., 2011), and of adolescent binge drinking (Donohew et al., 1999; Quinn, Stappenbeck, & Fromme, 2011).

Importantly too, sensation seekers tend to prefer friends who are compatible with their sensation seeking characteristics (Zuckerman 1991a; Zuckerman 1994), so that adolescents high in sensation seeking may seek out sensation seeking peers. This could be especially salient in the context of adolescent sport, which as described above, is linked to high sensation seeking. Interestingly, too, some research suggests that high sensation seekers tend to engage in particular high-risk behaviours when socializing with peers (Donohew et al., 1999a), who cluster together on the basis of a mutual attraction to various experiences, especially those experiences involving substances

(Roberti, 2004). With this in mind, it is possible that sensation seekers will seek out other sensation seekers in sport and socialise with these risky peers around alcohol.

Given identified links between sport participation and sensation seeking and between sensation seeking and alcohol use, it is important to investigate these associations among adolescent athletes. Because sensation seekers are drawn to sport, it is possible that the aggregation of like-minded peers, results in accelerations in binge drinking within the sport environment. However, within the context of sport, the dynamics of sensation seeking, associating with risky peers, and binge drinking, are not well understood. As a result, research is needed that investigates these constructs together. Such research can help parse out constructs together to determine the influence each one has on each other. For example, it is unclear whether sensation seeking or associating with risky peers is the more potent driver of adolescent binge drinking, or whether both influence binge drinking when combined in a single model. To address this question, this thesis maps the trajectories of sensation seeking, binge drinking and risky peers in sport together, over time, in chapter 5.

Depressed mood

As this thesis examines binge drinking in the context of adolescent sport, it is necessary to control for important confounds, including that of depressed mood (see chapter 4). Indeed, research that examines binge drinking during adolescence needs to account for potential spurious factors, and one notable confound in relation to both motivation and binge drinking is depressed mood. In general, depressed mood tends to increase across adolescence (Cole et al., 2002; Garber, Keiley, & Martin, 2002; Kashani et al., 1987; McGee, Feehan, Williams, & Anderson, 1992). Early adolescence is a particularly challenging and stressful developmental stage and many studies report a significant increase in depressed mood from late childhood to early adolescence,

especially in girls (e.g., Angold, Erkanli, Silberg, Eaves, & Costello, 2002; Cole et al., 2002; Holsen, Kraft, & Vittersø, 2000; Twenge & Nolen-Hoeksema, 2002). For instance, research using latent growth curve analyses shows that levels of depressed mood are low during middle childhood but increase significantly over the course of early adolescence (Cole et al., 2002; Garber et al., 2002; Ge et al., 1994). This is followed by declines in depressed mood during late adolescence and early adulthood (Ge, Natsuaki, & Conger, 2006; Gutman & Eccles, 2007).

Importantly, previous studies show that depressed mood is positively related to adolescent alcohol use (Chassin, Pitts, & Prost, 2002; Kubik et al., 2002) and is linked with binge drinking (Windle, 1999; Johnston, O'Malley & Bachman, 1998). Further, depression itself is also associated with subsequent increases in binge drinking (Deykin, Levy, & Wells, 1987; O'Malley, Johnston, & Bachman, 1998). Adolescents may binge drink to reduce negative emotions, such as depressed mood and anxiety (Lansford et al., 2009). Moreover, depressed mood may also influence individual motivations, including those in the context of sport, so that research that examines motivations and binge drinking would do well to control for depressed mood as an important confound.

The Current Thesis

The primary aim of this thesis was to identify individual differences among adolescent athletes embedded within the sport context, individual differences that serve to promote positive experiences in sport for some, and increase vulnerabilities to risk for others. As stated earlier, generally, research findings suggest that participating in sport is associated with positive developmental experiences. However, sport participation is also linked to certain risks, including increased risk for alcohol use and binge drinking. A focus on the interplay between attributes of young people within the specific settings in which they are engaged is crucial for understanding how contexts such as sport foster

positive development for some adolescents and negative outcomes for others. This review has identified gaps in the literature associated with this interplay, which this thesis aims to address.

Although there is extensive research outlining the positive benefits of participating in sport for adolescents, not all adolescents have positive experiences. A current criticism of research on sport participation activities is the lack of focus on the factors that are associated with sport being beneficial versus risky. Identifying the individual differences among athletes in motivation, personality, and susceptibility to influence from their risky peers, can help explain the diversity in experiences among adolescent athletes. Indeed, individual differences such as personal characteristics and motivations, as well as opportunities and barriers within the sport setting, can influence the behavioural outcomes of sport participation, and is the central theme of this thesis.

Therefore, in order to better understand the dynamics between individual athlete attributes and the characteristics of the sport context, the first aim of this thesis was to examine individual differences in motivations among adolescent athletes, and whether these differences were related to positive experiences in sport for some athletes. In addition to the positive outcomes associated with sport participation, research to date has established links between sport and increased risk, including increased binge drinking (Lisha, & Sussman, 2009; Mays et al., 2010; Wichstrom, & Wichstrom, 2009). However, the factors that contribute to this growth in problematic drinking among adolescent athletes are not well understood. Therefore, the second aim of this thesis was to examine whether individual attributes of athletes, such as ability self-concept and depressed mood, promote vulnerabilities to risk behaviour, such as binge drinking. Additionally, the sport context has been found to have a higher proportion of peers who drink alcohol, compared to other contexts, and there are established links between

sensation seeking and sport participation and between sensation seeking and binge drinking. Therefore, the third aim of this thesis was to examine whether individual differences among athletes, such as sensation seeking, and the characteristics of the sport environment itself, such as risky peers, promotes binge drinking. Thus, the third aim seeks to establish whether accelerations in binge drinking among adolescent athletes is predicted by and occurs in tandem with, sensation seeking and risky sporting peers.

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Preface to Chapter Three

This thesis aims to understand how adolescents' motivational beliefs relate to their developmental experiences in sport. The first aim of this thesis is to examine whether motivations, such as attainment value and ability self-concept, are related to positive developmental experiences in sport. Study one investigated whether the motivational constructs of attainment value and ability self-concept predict experiences of identity and flow in youth sport, and whether this link was moderated by intensity of participation. In other words, importance or value placed on sport and the belief in one's competence at sport determine the extent to which sport offers opportunities for reflecting on identity and experiencing flow, and are these links conditioned by how much time is spent participating in sport.

Although previous research provides some indication of the varying developmental opportunities afforded to adolescents through participating in organized sport (Barber, Abbott, Blomfield, & Eccles, 2009; Feldman & Majasko, 2005; Hansen, Larson, & Dworkin, 2003; Marsh & Kleitman, 2002), it offers insufficient information about specific developmental processes that occur (Larson, Hanson & Moneta, 2006). Therefore, more research is needed to determine how adolescent development is influenced vis a vis participating in structured sport (Eccles, Barber, Stone, & Hunt, 2003). Additionally, there is a need to investigate more closely the association between developmental experiences and adolescents' extracurricular sport participation within the Australian context, given high rates of participation in and valuing of adolescent sport.

This study was motivated by a recognition that not all young people enjoy sport participation, but rather some play sport because of external pressures from family or friends. In such circumstances, adolescents may feel they have fewer sport skills than

they would wish. Alternatively, they may not care about being an athlete at all. How these aspects of motivation influence the gains achieved in sport, especially those related to identity and flow, is the central focus of this study.

Indeed, it is important to consider in detail under which circumstances sport offers benefits for adolescents, as this will likely vary based on the motivations of the athletes. Therefore, Study one adds to previous research by contributing an individual differences approach to considering sport and its effects on adolescent athletes. Study one thus makes a unique contribution to the literature, as it assesses individual differences in attainment value and ability self-concept, and their links to positive experiences in adolescent sport.

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2. CHAPTER THREE: Study 1

Who gets more out of sport? The role of value and perceived ability in flow and identity-related experiences in adolescent sport.

This chapter includes a co-authored paper. The bibliographic details of the co-authored paper, including all authors, are:

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My contribution to the paper involved:

I collected and prepared the data, formulated the question in collaboration with my co-authors, analysed the data, and drafted the manuscript. My co-author then reviewed the manuscript draft, suggesting edits. I made the revisions requested by the Journal, in collaboration with my co-author.

_____ (Date) 20/09/16

Catherine F Drane

_____ (Date) 20/09/16

Supervisor and Co-author: Prof Bonnie Barber

Abstract

Sport is a context that provides positive developmental benefits to adolescents. However, these benefits are not distributed equally to all participants. This study examined whether the motivational constructs of attainment value and ability self-concept were related to positive developmental experiences in sport, and tested intensity of participation as a moderator of this relation. A sample of 1,628 students (954 grade 9, 674 grade 12) reported their developmental experiences in sport in two domains: identity formation and flow. Higher levels of attainment value and ability self-concept in sport were related to more identity and flow experiences. In addition, intensity of participation moderated the links between attainment value and identity and flow, and ability self-concept and identity, for older students. Placing higher value on sport was most strongly related to older students' positive experiences at higher levels of involvement. This study contributes to understanding the role of individual differences in developmental experiences in sport.

KEYWORDS: adolescence, sport participation, flow, identity, motivation

Who gets more out of sport? The role of value and perceived ability in flow and identity-related experiences in adolescent sport.

Adolescents spend much of their 'out of school' time participating in extracurricular sport activities which can be thought of as distinct learning contexts offering adolescents a platform for personal growth and development. There is extensive evidence for the role of extracurricular sport participation in adolescent development (Barber, Abbott, Blomfield, & Eccles, 2009; Feldman & Majasko, 2005; Marsh & Kleitman, 2002), with participation positively associated with indicators of academic performance (Eccles & Barber, 1999; Fredricks & Eccles, 2006), emotional regulation, initiative, and team work (Larson, Hansen & Moneta, 2006), and development of values such as responsibility, conformity, persistence, courage, and self-control (Hansen & Larsen, 2007; Kleiber & Kirshnit, 1991).

Most Australian adolescents participate in sport, with 60% participating in sport outside of school hours (Australian Bureau of Statistics, 2012). Given the normative nature of sport participation, much research has examined the role organized sports play in the development of age-appropriate competencies (Barber, Stone, & Eccles, 2010). Although the benefits of sport participation are well documented, not all adolescents have positive experiences. Why do some benefit, whereas others do not? To have positive experiences requires more than simply going through the motions of what is required for sport participation. Intrinsic mechanisms and motivations play an important role as well.

It is important to consider the quality of extracurricular experiences for each individual, and to identify conditions in which adolescents flourish and thrive (Theokas et al., 2005). The quality of experience may make the difference between a positive or negative developmental outcome, and may account for variations in psychological well-

being (Hansen et al., 2003). Eccles and her colleagues argue that an individual's choice of an activity, persistence, and performance can be explained by their own beliefs about how well they will do in the activity and the extent to which they value the activity (Eccles et al., 1993; Wigfield, 1994; Wigfield & Eccles, 1992). Therefore, it is possible that adolescents who are fully engaged in their sport, that is, psychologically invested and motivated, who have confidence in their ability to perform well along with expectations for success, and who attach value to playing their sport, reap greater psychological benefits than less invested or confident adolescents.

A focus on the interplay between attributes of young people and the settings in which they are engaged is crucial for understanding contexts that foster positive development. Contemporary developmental systems theory emphasises processes involved in the changing relations between developing individuals and their contexts (Lerner & Castellino, 2002). Likewise, person-environment fit theory emphasises the impact the environment has on adolescent development, and considers how the changing needs of the young person can interact with attributes of the environment to shape developmental pathways (Eccles et al., 1993). The person-environment fit theory provides an overarching framework to highlight the importance for adolescents to have a match between their changing developmental needs and their environment. During adolescence, emotional, cognitive and social needs shift as new developmental tasks, such as autonomy and identity formation, become salient. Contexts that are responsive to these developmental needs will continue to motivate and engage adolescents as they mature (Eccles et al., 1993). Adolescents whose environments do not afford opportunities well aligned for building competence and sense of self are less likely to do well or be motivated than adolescents whose contexts are more optimally matched to their developmental needs (Eccles, 2008; Eccles & Midgely, 1989; Eccles et al., 1993).

Applying both of these theories specifically to sport suggests that a fit is required between the changing developmental needs of the individual and the sport context so that growth and challenge can occur. More specifically, if the need is to feel competent in their chosen sport, adolescents with well aligned self-concepts should find the sport setting satisfies that need. Likewise, those who think sport is important would find such a context validating.

Developmental Experiences in Sport

Researchers have begun to investigate the underlying processes of extracurricular activity participation and in doing so have recognized the role organized activities play in affording adolescents a range of developmental experiences. Developmental experiences can be thought of as developmental opportunities which promote key developmental tasks. These tasks include acquiring habits of both physical and psychological health (Eccles et al., 2003).

One developmental experience associated with activity participation is identity exploration, which is a crucial task in adolescence. If the identity formation process is successful, the adolescent emerges more individuated with an understanding of who they are and how they fit into the world (Erikson, 1968; Sharp, Coatsworth, Darling, Cumsille, & Ranieri, 2007). Furthermore, the formation of a cohesive identity is associated with healthier social and psychological functioning and lower rates of problem behaviour (De Haan & MacDermid, 1999; Jones & Hartmann, 1988; Jones, Hartmann, Grochowski, & Glider, 1989; Waterman, 1992).

Research on identity formation has recognized the role sport participation plays as a context for identity work (Barber, Stone, Hunt, & Eccles, 2005; Eccles & Barber, 1999; Eccles et al., 2003; Hansen et al., 2003; Larson, 2000; Larson, Hansen, & Moneta, 2006; Waterman, 1990). In order to evaluate how participation in organized

sport activities contributes to adolescent development, researchers have examined the role of sport participation in the development of age-appropriate competencies (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). Larson, Hansen & Moneta (2006) suggest that extracurricular sports stand out from other school contexts because they offer opportunities for adolescents to develop initiative, and learn new skills as well as emotional competencies. Acquiring competencies allows adolescents to tap into the resources that promote positive functioning (Eccles et al., 2003; Mahoney & Bergman, 2002; Mahoney et al., 2006). A mechanism whereby sports may have a positive influence in adolescent development is through the validation of identity. When a sport confirms an adolescent's self-image, it can promote psychological well-being as well as school attachment (Eccles & Barber, 1999).

In addition to identity work, sport also offers opportunities for flow experiences (Csikszentmihalyi & Rochberg-Halton, 1981). Flow experiences are indicative of the fit between person and environment which promotes psychological health and well-being, a key developmental task of adolescence (Eccles et al., 2003; Lerner & Lerner, 1987). Flow is regarded as a state of consciousness, where concentration becomes so focused that complete absorption in an activity occurs. Experiencing flow is intrinsically rewarding, resulting in a deep sense of enjoyment, harmony, and happiness (Csikszentmihalyi, 1990). Flow is a positive experience that is so intrinsically rewarding that individuals seek to repeat the experience, therefore flow can influence an individual's future motivation to remain in an activity long-term (Schuler & Brunner, 2009). The flow experience is achieved when an individual is challenged beyond their average experience, with their personal skills consistent with the level of challenge. In other words, there is a balance between high challenge and high skill level, and the combination of both of these produces flow. However, exactly what is considered

challenging is based on an individual's perception of challenge, and perception of skill level, rather than an objective assessment. Therefore, the ability to self-assess skills is paramount to experiencing flow. Staying in flow requires an individual to take on increasingly greater challenges and consequently to re-assess their skill level (Csikszentmihalyi & Csikszentmihalyi, 1988). Flow typically occurs in clearly structured activities in which the level of challenge and skill can be varied and controlled, such as sport. Therefore, sport becomes an ideal platform for understanding under what circumstances adolescents experience flow.

Much of the literature on flow in sport has focused on elite athletes (Jackson & Eklund, 2002; Jackson, Ford, Kimiecik, & Marsh, 1998; Jackson & Marsh, 1996;) in order to understand the role that positive experiences play in achieving high levels of sport performance (Jackson, 1995, 1996; Jackson & Roberts, 1992). These studies demonstrate that elite athletes report experiencing flow during both practice sessions and competition, and clearly value experiencing flow as part of their overall sport involvement. Furthermore Stein, Kimiecik & Jackson (1995) examined flow in participants in recreational, non-elite, sport contexts and found support for the flow experience, suggesting that the experience of flow is not confined to the elite athletes and can occur for those developing sport skills. The current study thus incorporates flow, as well as identity work, as key developmental experiences in adolescent sport.

Individual Differences among Athletes

Adolescents who spend time participating in organized activities on a regular basis are typically fuelled by intrinsic motivations (Mahoney, Harris & Eccles, 2006). Adolescents' motivation can be seen as influencing the degree of psychological engagement in organized activities and the extent to which participation yields developmental experiences. Hansen and Larson (2007) evaluated four factors

hypothesized to be associated with more positive experiences in organized youth activities. Developmental experiences were measured using the Youth Experiences Survey. One of the four factors found to amplify developmental experiences was motivation, with adolescents who reported more motivation, in the form of enjoyment, reporting higher rates of developmental experiences in organized activities, including sport (Hansen & Larson, 2007). Adolescents are motivated to participate in organized activities for intrinsic reasons beyond enjoyment. According to motivation theories, the strongest predictors of participation in activities should be ability beliefs and interest (Eccles et al., 1993; Ryan & Deci, 2000).

When considering adolescent motivation in sport, ability and value beliefs play an important role. The expectancy-value theory suggests that individuals' choice of activity, persistence in the activity, and overall performance can be explained by beliefs about how well they will do in the activity and the extent to which they value the activity (Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992). Ability self-concept refers to an individual's perceived ability or competence at a given activity and is regarded as an important aspect of self-concept (Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992). Attainment value is the importance students attach to a task as it relates to their concept of identity and their ideals or competence in a given field (Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992). For example, adolescents who identify as athletes will set goals related to their sport. Those adolescents are then motivated to attain the goals, as they are associated with their understanding of 'who they are' (Barber et al., 2005; Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992). Attainment value can be regarded as a mechanism that underpins choice and may highlight the importance of activity participation being voluntary. Personal performance expectations, including perceptions of ability, coupled

with the value adolescents attach to an activity will not only contribute to their choice of activity but will also influence perceptions of experiences as developmentally facilitative, with opportunities for challenge and growth.

As children grow, they begin to develop mental images of who they are and who they would like to be (Eccles & Harold, 1991). These images include such things as personal values, ideations of personality and capabilities, long-term plans/goals, conceptions of gender roles, and self-schema (Eccles & Harold, 1991). Eccles et al. (1983) suggest that individuals will choose to participate in activities that they see as being compatible with their self-images and avoid activities that are inconsistent with these images. Applying the concept of attainment value and ability self-concept specifically to sporting activities suggests that if adolescents view a sport as requiring the characteristic of speed, they believe they are fast, and they want to confirm that they are fast, then the attainment value of the sport is high for those adolescents (Eccles & Harold, 1991). The sport environment provides adolescents with the opportunities and the freedom to evaluate what interests them, where their talents lie and what they value. For each individual, some activities are more likely to promote identity formation than others. Eccles et al., (2003) describe these activities as having high “attainment value” or importance. Adolescents are more likely to choose a specific sport if they place high value on doing well and feel confident in their own ability to do well, in this sense, motivation provides a platform for forming an identity around sport (Eccles, 2009). Furthermore, when adolescents have confidence in their own abilities and value being good at a sport that provides new challenges and requires the use of new skills, they may experience a sense of deep enjoyment or flow. Attributing high value to being good at sport and playing at the limit of one’s potential can be so intrinsically rewarding that individuals seek to experience it again and again.

Participation Intensity and Age

In general, as amount of time spent in structured activities increases, positive outcomes increase (Barber et al., 2010; Larson & Verma, 1999). This link may be related to increased opportunities to experience the developmentally facilitative aspects of participation. For example, more hours spent in a particular sport may afford greater opportunities for self-reflection and deep concentration or flow. What is not well understood is whether the intensity of participation may also condition the relation between individual attributes and sport experiences. To the extent that self-beliefs such as values and expectancies align well to the particular sport context, such congruence may be most auspicious for those who spend more time in those settings. Increased exposure is likely to be more beneficial in situations where the experiences align with one's self image, relative to spending greater non-personally relevant activity time. Whether having more time invested in sport increases the alignment of motivational beliefs with developmental experiences in sport has not been studied previously. This study tests those links.

Adolescence is a period of growth both physically and psychologically during which adolescents are gradually acquiring abilities and capabilities (Larson, 2000). Specifically, Erikson argued that certain tasks become primary at different ages or stages of development, and he highlighted, in particular, the developing capacity for self-reflection as a feature of adolescence (Erikson, 1968). An important consideration of the adolescent period is the impact that the final school year may have on both developmental experiences and motivation. Adolescents in grade 12 are preparing to transition out of high school and these students may be particularly focused on the developmental task of identity formation. It is possible that the alignment of self-beliefs and experiences becomes particularly salient at this time of transition. For this reason

grade 12 sport participants were selected for this study and were compared to a cohort of grade 9 sport participants.

Current Study

We aim to understand how motivational beliefs of adolescents predict developmental experiences in their sport. In particular, the investigation of attainment value (the importance attached to a task) and ability self-concept (how good you think you are at a task) may help to explain differences in experiences reported by athletes. The current study examined associations between attainment value, ability self-concept, intensity of participation, age, and the developmental experiences of identity formation and flow in youth sport.

We predicted that higher levels of attainment value and ability self-concept would be associated with higher levels of identity formation and flow experiences for adolescents. Previous research has shown that dosage of participation is developmentally important for adolescents in the later stages of development (Larson & Verma, 1999), thus, we tested whether or not intensity and age jointly conditioned the association between attainment value and experiences, and ability self-concept and experiences in sport. That is, we predicted three-way interactions between attainment value, intensity and age, as well as ability self-concept, intensity and age.

Method

Participants

Participants were drawn from the Youth Activity Participation Study (YAPS) of Western Australia as part of a larger longitudinal study of adolescent extracurricular activities and developmental outcomes. The YAPS participants were from 34 government (45.9%) and non-government (54.1%) high schools, from metropolitan (63.3%) and regional (36.7%) areas across Western Australia. The sample consisted of

1,628 students: 954 in grade nine and 674 in grade twelve ($M_{age} = 15.22$, $SD_{age} = 1.52$, $Range_{age} = 13 - 18$ years).

Measures

Sport Participation. Adolescents' structured extracurricular sport involvement was assessed using measures adapted from previous research (Barber et al., 2005); to reflect Australian youth sport participation (Blomfield & Barber, 2009). The self-report survey included a checklist for reporting extracurricular sport participation which included a list of 24 sports (e.g., hockey, soccer). Youth were asked to check all of the sports in which they were involved during the past year, with a space for 'other' if a sport was not present in the list. Youth were also asked to designate which sport they spent the greatest number of hours playing; this sport was their 'target' sport. The most common target sports listed by participants were netball, football and athletics. All questions asked in this study were in relation to the target sport. The target sports consisted of both school-based (63.9%) and community-based (36.1%) sports.

Developmental Experiences in Sport. To assess adolescent experiences in sport, youth were asked a series of questions about their perceived experiences in their 'target' sport, including identity formation and flow. The identity formation measure was based on the 'Youth Experiences Survey – YES' (Hansen et al., 2003; Dworkin et al., 2003). The five-item identity construct (Cronbach's $\alpha = .76$) was used in the interest of model parsimony (Larson, Hansen & Moneta., 2006) and measured identity exploration using 3 items (e.g., tried doing new things) and identity reflection using 2 items (e.g., this activity got me thinking about who I am). Responses were rated on a 4-point scale, ranging from 1 = 'Not at all' to 4 = 'Yes definitely'. The 3 flow experience items were taken from Tiggemann & Slater (2001), developed to operationalise Csikszentmihalyi's (1990) description of the common characteristics of flow experiences (Cronbach's $\alpha =$

.89): I become so involved in this sport that I lose track of time; During this sport I feel so involved that nothing seems to matter; I concentrate so intensely that I can't think about anything else. The responses were rated on a 7-point scale, with 1 = 'Never' to 7 = 'always'.

Motivation. To assess adolescent motivation in sport, youth were asked a series of questions about their motivations in their 'target' sport, including attainment value and ability self-concept. (Eccles, 1987; Eccles et al., 1983). Attainment value was measured using 1 item: *How important is it to you to be good at this sporting activity?* Responses were rated on a 1 – 7 scale, with 1 representing 'not at all important' to 7 indicating 'very important'. Ability self-concept was measured using 1 item: *Compared to other kids your age, how good do you feel you are at this sport?* Responses were rated on a 1 – 7 scale, with 1 representing 'one of the worst' to 7 indicating 'one of the best'.

Moderator: Intensity of Participation. Intensity of participation in the 'target' sport was assessed using a question in which adolescents reported: *How many hours per week do you spend in this activity?* A centered score for intensity of participation was also calculated prior to creating the interaction terms.

Procedure

Ethical approval for this study was obtained from the Murdoch University Human Research Ethics Committee, the Western Australian Department of Education and the Catholic Education Office. In order to participate, informed parent and student consent was required. The survey was administered at school over a 40-minute session, administered via iPads connected to a wireless intranet. Participants were informed of the confidentiality of their responses and reminded that participation was voluntary.

Results

Our primary research aim was to examine how attainment value and ability self-concept were related to experiences of identity and flow in sport, and test whether intensity of participation moderated these relations. All predictor scores were mean-centered to ensure each first-order coefficient has an interpretation that was meaningful (Cohen, Cohen, West & Aiken, 2003). The necessary condition of model identification was satisfied for the measurement model with the number of independent parameters (17) being smaller than the independent covariance equations (36). A series of moderated regression analyses in SEM were conducted, using Amos 21, to examine the independent and interactive effects of attainment value, ability self-concept, and intensity of participation on experiences in sport. Figure 3.1 shows the structural model.

Hypothesized Model.

To evaluate the hypothesized model, it is necessary to determine whether the associations among indicators and latent variables in the model adequately reflect the observed associations in the data. Therefore, two models were considered in this study, the hypothesized model, which includes a moderating variable and interaction terms (Attainment value x Intensity; Ability self-concept x Intensity), and a second constrained model, with moderator and interaction terms fixed to 0. The purpose of this is to test whether the proposed model better represents the relations between the constructs than the alternate model without moderation. The constrained model showed poor fit $\chi^2(73) = 7679.08, p < .001; RMSEA = .25$ (90% C.I: .25-.26), NFI = .56, TLI = .46, CFI = .57. The hypothesized model with better fit was used in subsequent analyses $\chi^2(62) = 599.32, p < .001; RMSEA = .07$ (90% C.I: .07 - .08), NFI = .96, TLI = .96, CFI = .97.

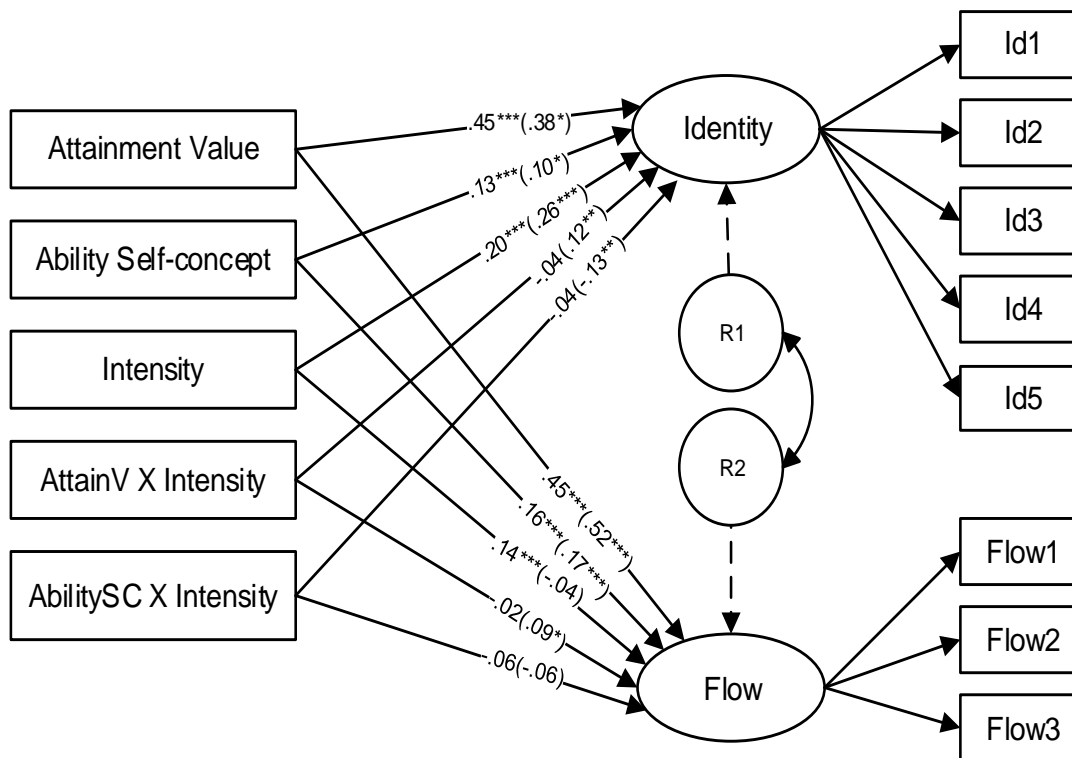


Figure 2-1 Structural Equation Model showing the standardized regression coefficients for grade 9's and grade 12's (Grade 12's in parentheses).

Note. AttainV = Attainment Value; AbilitySC = Ability Self-concept; ID = Identity; R = Residual.
 * $p < .05$, ** $p < .01$, *** $p < .001$

Multigroup Invariance Testing

Multi-group analysis was initially run based on grade level, however, invariance testing revealed the identity and flow measurement models for grade 9 and 12 were invariant at the configural level but not at the structural level. Therefore the coefficients could not be compared across groups. These invariance results, suggesting that grade levels could not be directly compared makes sense developmentally. During different developmental stages, students are likely to interpret questions relating to their identity formation and flow experience differently. Given that we could not directly compare the strength of relations between age groups, two separate models were fit (grade 9 and grade 12). However no inferential comparisons were made between the two groups and only observations of patterns of interactions between the two models were made. Both structural models satisfied the condition for model identification, that is, for the grade 9

model, the number of independent parameters (42) were smaller than the independent covariance equations (91). Likewise, for the grade 12 model, the number of independent parameters (55) were smaller than the independent covariance equations (104). Table 3.1 shows the correlation matrix, means and standard deviations of all constructs in the two models. Given the large sample sizes, fit indices were used to determine model fit (Bollen, 1989). The grade 12 model fit was adequate according to the descriptive fit indices, $\chi^2(49, N = 674) = 150.04, p < .001, RMSEA = .05$ (90% C.I: .04-.07), NFI = .96, TLI = .95, CFI = .97). Likewise, the grade 9 model fit the data adequately, $\chi^2(49, N = 954) = 209.84, p < .001, RMSEA = .06$ (90% C.I: .06-.07), NFI = .95, TLI = .94, CFI = .96.

Table 2-1 Correlation matrix, means and standard deviations of constructs for grade 9 and 12 Adolescents.

Variables	1	2	3	4	5	Means	SD
1. Attainment Value	–	0.60	0.28	0.50	0.59	5.32	1.25
2. Ability self-concept	0.53	–	0.33	0.42	0.46	5.15	0.99
3. Intensity of participation	0.28	0.27	–	0.37	0.15	9.54	6.12
4. Identity	0.59	0.43	0.35	–	0.59	2.65	0.55
5. Flow	0.58	0.45	0.29	0.69	–	4.74	1.27
Means	5.44	5.19	10.30	2.69	4.73	–	–
Standard Deviations	1.27	1.20	7.11	0.60	1.38	–	–

Note. Grade 12's are presented on top diagonal of the matrix.

Model results

The results for the younger adolescents (grade 9) show significant positive direct effects between attainment value and ability self-concept and identity and flow. Higher levels of attainment value and ability self-concept were related to more experiences of

identity and flow in sport. Further, intensity of participation was positively associated with identity and negatively associated with flow. None of the interaction terms were significant for grade 9 students.

The results for the older (grade 12) students show significant direct effects of attainment value and ability self-concept on identity and flow. Higher levels of attainment value and ability self-concept were related to more experiences of identity and flow in sport. Intensity of participation was also significantly associated with identity formation in sport. More hours in sport related to more identity-related experiences in sport. The intensity of participation to flow link was non-significant for grade 12 students. Three of the two-way interactions (attainment value x intensity predicting identity; attainment value x intensity predicting flow; ability self-concept x intensity predicting identity) were significant for the older adolescents, indicating that intensity of participation moderated the links between attainment value and identity and between attainment value and flow in sport, and between ability self-concept and identity. The fourth two-way interaction (ability self-concept x intensity predicting flow) was not significant.

Probing Interactions

We further probed the significant two-way interactions by plotting the simple slopes (Dawson & Richter, 2006) at 1 standard deviation above and below the mean for intensity. The simple slopes tests for attainment value and flow was significantly different from zero at both high intensity ($Intensity_{high}$, $B = .59$, $t = 10.07$, $p < .001$) and low intensity ($Intensity_{low}$, $B = .44$, $t = 8.40$, $p < .001$). Higher attainment value was related to more flow and the relationship was stronger for high intensity participation than for low intensity participation (See Figure 3.2).

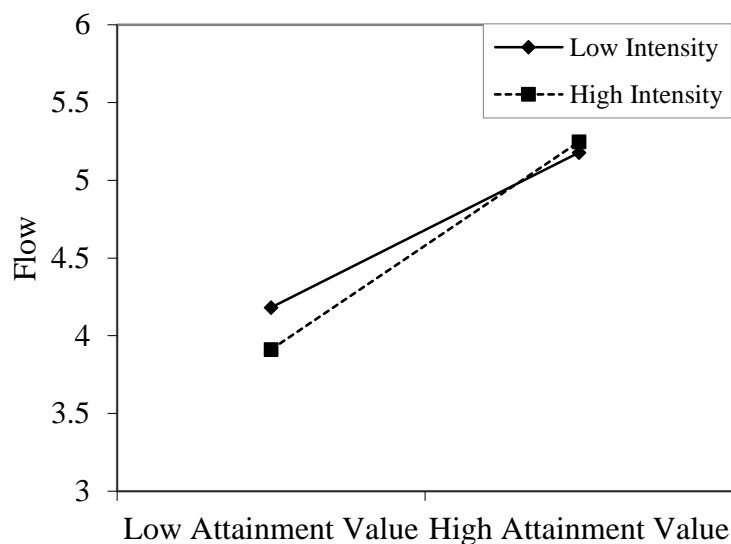


Figure 2-2 Grade 12 flow experiences by attainment value and participation intensity.
 Note. Low Intensity *** $p < .001$; High Intensity *** $p < .001$.

The relationship between attainment value and identity was significantly different from zero at both high intensity (Intensity_{high}, $B = .19$, $t = 11.350$, $p < .001$) and low intensity (Intensity_{low}, $B = .11$, $t = 8.77$, $p < .001$). The greater the attainment value the more identity related experiences participants reported (See Figure 3.3). Only in one group was having higher ability self-concept related to greater experiences of identity and that was in the lower intensity group. Simple slope analyses showed the relation between ability self-concept and identity was not significantly different from zero at high intensity (Intensity_{high}, $B = .01$, $t = 0.143$, $p = .886$) but was significantly different from zero at low intensity (Intensity_{low}, $B = .09$, $t = 2.614$, $p = .009$). The relations between ability self-concept and identity was strongest for individuals who reported the lowest levels of intensity of participation in sport (See Figure 3.4).

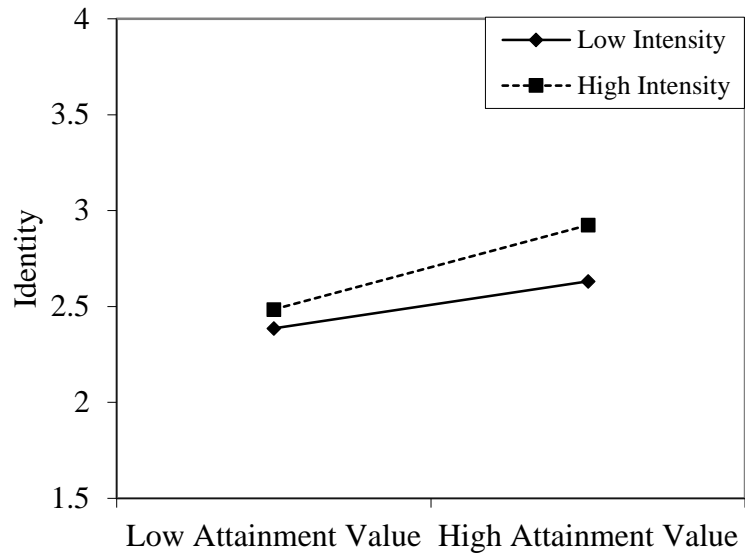


Figure 2-3 Grade 12 identity experiences by attainment value and participation intensity. *Note.* Low Intensity *** $p < .001$; High Intensity *** $p < .001$.

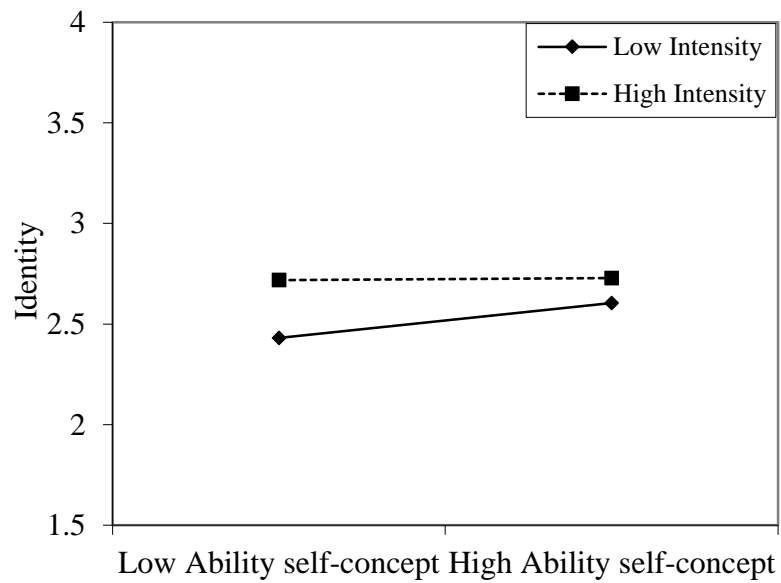


Figure 2-4 Grade 12 identity experiences by ability self-concept and participation intensity. *Note.* Low Intensity *** $p < .001$; High Intensity $p = .886$.

Discussion

The aim of this study was to examine the role of attainment value, ability self-concept, and intensity of participation in the developmental experiences of identity formation and flow in sport. We found that greater importance placed on sport was related to more positive developmental experiences. For older adolescents, this link was moderated by intensity of participation with those who played more hours showing the strongest relations between value and experiences. Adolescents with higher perceptions of their sport ability also reported more positive experiences in sport – that is, they reported more experiences of identity and flow. The link between ability self-concept and identity was moderated by intensity of participation for older adolescents; however, it was strongest at low levels of intensity.

As the models for younger and older adolescents were not invariant, we did not test the 3-way interactions between age, intensity, and motivational beliefs, and thus cannot make any inferential comparison between the two cohorts. We can say, however, that for both grade levels, it was the adolescents who were invested in their sport, valued it, and believed they were good at it, who benefited most in terms of developmental experiences. Such students reported greater flow, or sense of focus and concentration, which is important for well-being. Adolescents' need something in which to become engaged (Larson, 2000). Through opportunities for flow, sport may offer adolescents more opportunities to be completely involved and focused than other areas of their lives such as school classes or paid work offer, and our results suggest these positive experiences may be most common, at least among older youth, for those who are more motivated and personally aligned with their sport. These results are consistent with the evidence from sport psychology that indicates enjoyment of sport is linked to motivation (Scanlan, Babkes, & Scanlan, 2005), and make a contribution by

highlighting the importance of amount of time spent in the activity to the dynamics of person-environment fit.

Sport was also a context for exploring and reflecting on identity, particularly for those whose self-beliefs aligned well to their target sport in terms of values and self-concept of ability. However, not all sports will facilitate identity exploration and reflection equally for all students (Barber et al., 2005; Eccles & Barber, 1999). The current study found that the extent to which an adolescent places high value on participating in their sport is facilitative of the identity process. When the environment is responsive to their changing needs, providing diversity or a range of sports to choose from, adolescents are likely to find a greater fit with their interests and abilities, and therefore have higher attainment value (Barber et al., 2005; Eccles & Barber, 1999) perhaps leading to more positive developmental experiences, such as forming an identity around being an athlete. If the sport environment changes in developmentally regressive ways, then there is a mismatch that can result in a decline in motivation, interest, performance, and behaviour (Eccles & Midgely, 1989; Eccles et al., 1993; Eccles, 2008).

In addition, for older youth, how much they participated in their sport made a difference. Investing more hours in sport was related to more identity-related experiences. Further, for those young people who highly valued their target sport, the relationship with greater flow and identity experiences increased with amount of time spent playing. Towards the end of high school, the school workload increases with competing commitments; those who are still involved in sport and haven't dropped out tend to be very committed, highly invested, and fully engaged in their sport. For those who are highly motivated, spending more hours playing sport is a good fit to personal motivations. Such commitment can translate, as evident in our data, to having more

positive and self-reflective experiences during sport participation. Interestingly, for older adolescents there was a stronger link between ability self-concept and identity experiences at low intensity than at high intensity. However, this effect can be interpreted to be one of a compensatory nature. At high intensity, regardless of self-concept, more identity experiences are reported than at low intensity. However, having high ability self-concept was related to identity experiences even at low intensity, when compared to lower ability self-concept. Perhaps because of the commitment required from these older students to maintain higher intensity participation, there were other motivations present to elicit identity-related experiences. Those reporting low levels of participation may dabble in a sport for other reasons, such as hanging out with friends, and when they don't consider themselves very good at sport, they don't reflect much about what it means to who they are.

Policy Implications

Findings from the current study hold several implications for policy. The growing evidence for benefits of sport participation may influence policymakers to conclude that such advantages are available to all regardless of motivational intent, regardless of personal choice. However, not everyone benefits or has positive experiences in sport. Placing low value on sport was related to less frequent flow experiences in our sample, suggesting that sport participation pushed by parents or mandated by schools may not yield the optimal experiences for young people. Instead, the benefits of sports participation are contingent on intrinsic mechanisms, including adolescents' perceived sporting ability as well as the importance or meaning attached to their choice of sport. Adolescents who participate in sport participate because sport interests them and is meaningful to them, and self-appraisal of their sport ability confirms likely success. Furthermore, youth who participate less in sport may have intrinsic reasons for

participating less; they may lack interest or motivation for a sport that holds little value to them. If sport participation becomes mandatory or coercive, and not meaningful, it may not offer the same positive experiences for youth and could result in a trajectory that is negative rather than positive. This highlights the importance for schools and community programs to provide adolescents with a broader selection of activity alternatives so that adolescents may choose an activity, and not necessarily a sport, which is meaningful to them. Furthermore, schools who stipulate mandatory sport participation as a requirement of their extracurricular programs may need to consider the implications of such programs for adolescents with motivations not well aligned with sport. Notably, in the broader context of physical activity and health, many schools provide physical education within the primary curricular framework in order to educate children about healthy behaviour, and provide them with opportunities to be active. Nonetheless, and as this current study suggests, when designing and implementing extracurricular sport programs for adolescents, it is important to consider under what circumstances children experience positive outcomes.

Limitations

The results of the current study should be considered in light of its limitations. One of the study's central limitations is the cross-sectional nature of the data that does not allow for causal or temporal interpretations regarding the associations among the constructs. Further, although this study's model fits the data well, there may be alternative models that fit the data equally well that have not been assessed here. For instance, it is plausible that a reciprocal relationship exists such that adolescents who have high levels of positive experiences in sport also begin to value their sport more and in turn begin to see themselves as being good at their sport (Eccles., 2009).

Conclusions

Overall, the present study highlights the complexities surrounding sport participation as a context for psychological benefits. The psychological benefits of sport participation are not inevitable; participation does not automatically guarantee positive experiences. Positive developmental experiences depend on the fit between the values and motivations of athletes and the sporting environment in which they are embedded. If the sport environment is a good match to adolescents' motivations in sport, then positive developmental experiences are more frequent. The results of this study highlight the importance of considering the role of individual differences among athletes when examining the impact of sport on positive development. A promising place to begin is with particular motivations in sport, as the more personally invested and engaged an individual is in their sporting activity, the more psychological gain may accrue. Research should continue to take an individual differences approach to adolescents' sport engagement, to better disentangle the specific contexts that render the most benefits for particular adolescents, because the experiences gained from sports participation are not uniform for all adolescents.

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Preface to Chapter 4

Study 1 established the link between motivational properties (attainment value and ability self-concept), intensity of participation, and developmental experiences (identity formation and flow) in sport. The results showed that greater importance placed on sport was related to more positive developmental experiences. Further, this association was conditioned by the intensity with which older adolescents participated in sport. Those who played more hours of sport showed the strongest association between value and experiences. Study 1 also revealed that athletes with higher perceptions of their sport ability reported more positive experiences of identity and flow in sport. For older adolescent athletes, intensity of participation in sport conditioned the association between perceptions of their sport ability and their identity formation; however, this association was strongest at low levels of intensity. Study 1 thus highlighted the importance of understanding individual differences among adolescent athletes, and how these may promote positive experiences within the sports context for some adolescents.

In order to develop a more nuanced view of the sport context and explain diversity in experiences, understanding how processes operate differently depending on the attributes of the developing person is important (Bronfenbrenner, 1999). With this in mind, understanding how individual attributes of athletes may not only promote positive experiences within the sports context for some adolescents but contribute to the susceptibility to risk for others is a worthwhile endeavour that is more fully explored.

Thus, following on from Study 1 results highlighting the importance of positive motivational attributes, a question arises about whether a converse relationship might exist. That is, do low sport ability beliefs place one at risk? This is an important question, because there is evidence that sport participation and risk behaviour are linked, especially alcohol use (Eccles & Barber, 1999; Modecki, Barber, & Eccles,

2014). Research to date has established links between sport participation and increased binge drinking among adolescents (Lisha, & Sussman, 2009; Mays, DePadilla, Thompson, Kushner, & Windle, 2010; Wichstrom, & Wichstrom, 2009). However, research has not yet adequately identified factors associated with growth in problematic drinking among adolescent athletes.

Informed by the results from Study 1 indicating positive motivation facilitates healthy sport engagement, Study 2 considers the case in which motivation may be less positively aligned to sport. Thus, the focus of Study 2 is to investigate simultaneous within-person change in ability self-concept, depressed mood, and binge drinking for adolescent athletes across four years. A multivariate growth curve analysis was used to assess whether individual differences in motivation and adjustment (ability self-concept and depressed mood) change in alignment with escalating binge drinking and whether early levels of ability self-concept and depressed mood predict subsequent change in binge drinking among adolescent athletes. In all, modelling these constructs offer insight into the motivational properties of sport that might be related to variations in the course of alcohol use by athletes.

In study 2, it was important to examine the development of ability self-concept, depressed mood and binge drinking to determine which variables exert important effects and whether these were reciprocal. By modelling three curves together, rather than two, underlying change in the third variable is taken into account. Thus, the multivariate model is necessarily more conservative than the parallel process, and affords a fuller understanding of the developmental processes associated with adolescent binge drinking in sport. In order to do so a multivariate growth curve, model involves incremental steps. First, unconditional univariate models of change for each of the three constructs are fit to model early mean levels (intercept) and change (slope) in each variable over time, and associated variability. Second, a series of conditional models with study

covariates are estimated. Third, conditional parallel process growth curve models are fit, allowing for correlated intercepts and correlated changes among all possible parallel construct pairs. Further, slopes are regressed on intercepts. Lastly, all three variables are modelled together within a multivariate growth curve. This later model gives the full picture of change in key constructs over time, and is thus the focus of final interpretations.

The advantage of using a multivariate latent growth curve analysis in study 2 is that it provides an estimate of the initial levels of these three constructs and their rate of change over time and examines how these outcomes vary together. Here, the use of this method is important, as it allows for the simultaneous estimation of growth trajectories for binge drinking, ability self-concept and depressed mood, and thus addresses intra-individual change as well as associations of change in these three variables. In other words, study 2 allowed us to test whether time 1 ability self-concept, depressed mood, and binge drinking predicted subsequent change in the other constructs, accounting for each construct's own subsequent change.

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3. CHAPTER FOUR: Study 2

Binge drinking trajectories in high school athletes: The role of ability self-concept.

This chapter includes a co-authored paper. The bibliographic details of the co-authored paper, including all authors, are:

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My contribution to the paper involved:

I collected and prepared the data, formulated the question in collaboration with my co-authors, analysed the data, and drafted the manuscript. My co-author then reviewed the manuscript draft, suggesting edits.

_____ (Date) 20/09/16

Catherine F Drane

_____ (Date) 20/09/16

Supervisor and Co-author: Prof Bonnie Barber

Abstract

Objectives: To describe concurrent within-person change in adolescent binge drinking, sport ability self-concept and depressed mood for adolescent athletes across grades 8-11.

Design: Longitudinal data from 302 adolescent sport participants were analysed using multivariate growth curve analysis.

Methods: A multivariate growth curve model tracked early levels and concurrent change in self-reported binge drinking, ability self-concept, and depressed mood in athletes across four years.

Results: Findings revealed that early high levels of ability self-concept predicted less steep increases in binge drinking, and early high levels of depressed mood predicted greater increases in binge drinking in adolescent athletes. Increases in ability self-concept paralleled developmental increases in binge drinking, even after accounting for increases in depressed mood.

Conclusions: Among adolescent athletes, high sport ability self-concept at grade eight was protective against increases in binge drinking. However, athletes with positive self-perceptions are still susceptible to increases in binge drinking across the high school years.

Binge Drinking Trajectories in High School Athletes: The Role of Ability Self-Concept.

The sport context is an environment recognized for fostering positive developmental experiences for adolescents (Barber, Eccles, & Stone, 2001; Blomfield & Barber, 2011). Sport participation is positively associated with academic performance (Eccles & Barber, 1999; Fredricks & Eccles, 2006), emotional regulation and initiative (Larson, Hansen, & Moneta, 2006), and the development of responsibility, conformity, persistence, courage, and self-control (Hansen & Larson, 2007; Kleiber & Kirshnit, 1991). There is comprehensive evidence for the positive role of sport in adolescent development (Barber, Abbott, Blomfield, & Eccles, 2009; Feldman & Matjasko, 2005; Marsh & Kleitman, 2002). In contrast, there are some incongruous findings that sport is potentially risky for alcohol use, and there is growing evidence for the potential role that sport may play in other risk behaviours, in particular, binge drinking (Eccles & Barber, 1999; Modecki, Barber, & Eccles, 2014).

Research suggests that there is an association between organized sport participation and an increased binge drinking risk for adolescents (Eccles & Barber, 1999; Modecki, Barber, & Eccles, 2014). The evidence to date suggests that participation in sport is related to more frequent alcohol use (Martens, Dams-O'Connor, & Beck, 2006). Furthermore, adolescents who participate in competitive sports tend to consume more alcohol than those who do not participate (Eccles & Barber, 1999; Mays et al., 2010; Wetherill & Fromme, 2007). Illustratively, using latent growth curve analysis over three years, Mays et al., (2010) found that youth who engaged in sports showed a greater acceleration in problem alcohol use. This link of increased alcohol consumption in relation to sport participation is fairly robust; a recent review shows that 80% of published longitudinal studies find a significant link between adolescent sport participation and increased alcohol use (Kwan et al., 2014).

It is important to identify the factors that contribute to adolescent sport participants' binge drinking because it can have numerous negative long-term consequences. Approximately 14% of American adolescents report having been drunk in the past month and 17% of Australian adolescents report binge drinking on a monthly basis (Australian Institute of Health and Welfare 2010). Alcohol use typically commences and increases during adolescence (Brook, Cohen, & Brook, 1998; Chassin, Flora, & King, 2004; Chassin, Pitts & Prost, 2002; Chen & Kandel, 1995; De Witt et al., 2000; Steinberg, 2004). Notably, adolescent binge drinking also increases over time (Chassin, Pitts & Prost, 2002; Kwan, Cairney, Faulkner, & Pullenayegum, 2012). If heavy alcohol use persists there can be negative physical and mental health consequences in adulthood, such as, coronary heart disease, hypertension, aggression, and mood disorders (Stevenson, 2005). For this reason, identifying developmental risk factors that predict increases in binge drinking among adolescent athletes is important.

Not all adolescent athletes engage in binge drinking. Despite growing evidence that athletes, on average, drink more than their non-athlete peers, little is understood about the variability among young people in their susceptibility to heavy alcohol use in the sport context. That is, what are the individual attributes of the athletes that may make them vulnerable or resistant to binge drinking? For instance, one salient individual attribute of the athlete that could temper their vulnerability to drinking norms is their motivation. Specifically, every athlete has their own level of motivation influencing their experiences in sport - motivations which are contingent on expectations for success, perceived performance and competence in sport (Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992).

When considering an athlete's motivations in sport, competence and ability beliefs or self-concept, here referred to as sport ability self-concept, are key. For example, the expectancy-value theory proposes that widespread beliefs about ability and value

explain choice, persistence, and overall performance in sport (Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992). Thus, the construct of ability self-concept refers to an individual's perceived ability or competence in an activity. It is regarded as an important aspect of self-concept (Eccles et al., 1983; Wigfield, 1994; Wigfield & Eccles, 1992) and influences the development of their self-esteem (Harter, 1990, 1998).

Ability self-concept is shown to influence athletes' experiences in the sporting context (Drane & Barber, 2015). Considering one's self to be good at sport, can offer powerful motivations to engage in healthy practices, such as avoiding or minimizing alcohol consumption. Athletes who have a positive view of their sporting abilities may seek to protect their sport performance by abstaining from limiting behaviours that could undermine their performance. In this sense, young people who are committed to their sport, and who perceive their ability as high, may be protected from the normative increases in alcohol use during adolescence.

Conversely, if sport ability self-concept is low, motives for playing sport may differ. Sport may be seen as more social, an opportunity to hang out with friends, including recreational drinking with peers. In this sense, low ability self-concept may contribute to alcohol use in sport. Previous studies have linked constructs associated with ability self-concept with adolescent alcohol use in other contexts, potentially indicating that high ability self-concept is linked to less alcohol use (Swaim & Wayman, 2004). However, research to date has not assessed links between change in ability self-concept with change in binge drinking over time in the sport context. These constructs offer an important window into the motivational properties of sport that might be related to variations in the course of alcohol use by athletes.

One of the reasons that ability self-concept could link to drinking in sport is that ability self-concept declines across adolescence (Eccles, 1993; Fredricks & Eccles, 2002; Wigfield et al., 1991). Thus, as adolescent athletes undergo declines in self-

concept, they may look to other aspects of the sport context to define themselves, achieve popularity and boost self-esteem (Epstein, Griffin, & Botvin, 2002). Furthermore, adolescent athletes likely socialize one another towards engaging in increased drinking behaviour (Blomfield & Barber, 2010; Eccles & Barber, 1999). Thus, as adolescent athletes begin to compare themselves critically with others their age, their perceived relative level of ability or competence may influence their likelihood of engaging in maladaptive behaviours, such as binge drinking. That is, for athletes who perceive their level of ability as low, alcohol may offer a temporary solution to cope with negative feelings about low competence and to escape from stressors. As a result, adolescent athletes who perceive their ability in sport as low relative to their peers may be especially vulnerable to increases in binge drinking behaviour.

When examining the developmental course of binge drinking, it is important to control for other contributing factors. Specifically, one major potential confound in relation to both binge drinking *and* motivation is depressed mood. Depressed mood tends to increase across adolescence (Cole et al., 2002; Garber, Keiley, & Martin, 2002; Kashani et al., 1987; McGee, Feehan, Williams, & Anderson, 1992). Importantly, it is linked with increases in binge drinking (Deykin, Levy, & Wells, 1987; O'Malley, Johnston, & Bachman, 1998). Thus, depressed mood likely tracks over time with binge drinking. Moreover, adolescent athletes who perceive their ability as declining may also be at risk for increases in depressed mood. Thus, in the current study, in addition to mapping changes in ability self-concept and binge drinking, we also map changes in depressed mood. Mapping changes in depressed mood controls for its effects as a possible confound. Consequently, this allows the investigation of the ability self-concept construct to be independent.

Building on past research linking sport and binge drinking and motivation and binge drinking, we examine the trajectories of binge drinking, ability self-concept, and depressed mood among adolescent athletes across four years (grades 8-11). We concurrently modelled early levels (intercept) and change (slopes) in binge drinking, ability self-concept, and depressed mood. Thus, we investigated whether the within-person change in one construct (e.g. ability self-concept) travelled in tandem with change in another (e.g. binge drinking) controlling for change in a developmentally important third variable (e.g. depressed mood). Within these models, the predictive effects of early levels of each construct on growth in the others were also specified. This approach explains whether individual differences (ability self-concept and depressed mood) change in alignment with escalating binge drinking and whether early levels of ability self-concept and early levels of depressed mood predict subsequent binge drinking change among adolescent athletes.

Method

Participants

Participants were from the Youth Activity Participation Study (YAPS), a longitudinal study of adolescent extracurricular activity involvement and development. The YAPS participants were from 34 public (45.9%) and private (54.1%) high schools, from metropolitan (63.3%) and regional (36.7%) areas across Western Australia. Because our study focused on the inter-relations between ability self-concept, depressed mood, and binge drinking among adolescent sport participants, only the adolescents who participated in sport across four consecutive years were included in analyses.

Extracurricular sport participants were identified using a validated measure (Blomfield & Barber, 2010). At each wave, adolescents were asked if they had participated in any organized school or community sports/teams in the past year and to identify the sport to which they dedicated the most time. That sport, designated the

target sport, was the focus of further questions about experiences and self-perceptions during participation. Longitudinal data were available for 302 adolescents who identified as sport participants (40.5% male) in eighth grade ($M_{age} = 12.97$, $SD_{age} = .33$, $Range_{age} = 12 - 14$ years) and continued for the next three years. Thus, the final sample included adolescents who participated in a structured organized sport across the four waves.

Procedure

Ethical approval for this study was obtained from the University Human Research Ethics Committee. Study participation required active, informed parent and student consent. The survey, administered each year at school over a 40-minute session via laptops connected to a wireless intranet. Participants were informed of the confidentiality of their responses and reminded that participation was voluntary.

Measures

Ability self-concept.

Ability self-concept in sport was assessed using one item: *Compared to other kids your age, how good do you feel you are at this sport?* Responses were rated on a 1–7 scale, with 1 representing “one of the worst” to 7 indicating “one of the best.” (Eccles, 1987; 1993). Means and (standard deviations) for ability self-concept were as follows at each wave: $M_{w1} = 5.50$ (1.14); $M_{w2} = 5.32$ (1.27); $M_{w3} = 5.20$ (1.31); $M_{w4} = 5.16$ (1.25).

Binge drinking.

Binge drinking was measured using one item based on Fredericks and Eccles (2006). The item asks “*In the past 6 months, how often have you had more than 5 alcoholic drinks on one occasion?*” Responses were rated on an 8-point scale, from 1 = none to 8 = 31 or more times and previous research points to the validity of the measure (Modecki, Barber, & Eccles, 2014). Means and (standard deviations) for binge

drinking were as follows: $M_{w1} = 1.06 (.29)$; $M_{w2} = 1.27 (.77)$; $M_{w3} = 1.77 (1.52)$; $M_{w4} = 2.26 (1.92)$.

Depressed mood.

Depressed mood was conceptualized to reflect sport participants' mood state, but was not a measure of clinical depression. Depressed mood was measured using four items adapted from Barber et al. (2001). The four items were measured using a 6-point Likert scale, where 1 = *never* and 6 = *daily* and used the same question stem, "*How often do you:*" The items were "*feel unhappy, sad or depressed?*", "*feel that difficulties are piling up so high you can't overcome them?*", "*feel there is nothing nice you can look forward to?*" and "*lose your appetite OR eat a lot when you get upset?*" A shortened (four-item) depressed mood scale has been previously published (Abbott & Barber 2010) where the validity of the scale items was supported. Scale reliability was acceptable at each of the four waves. Cronbach's $\alpha_{w1} = .72$; $\alpha_{w2} = .76$; $\alpha_{w3} = .75$; $\alpha_{w4} = .77$. Means and (standard deviations) for depressed mood: $M_{w1} = 2.44 (.99)$; $M_{w2} = 2.52 (1.01)$; $M_{w3} = 2.56 (1.00)$; $M_{w4} = 2.63 (1.08)$.

Covariates.

Included in the current study were the covariates gender, Socio-economic status (SES), pubertal timing, and sport hours. SES was measured based on school-level index (see Blomfield and Barber, 2011) obtained from the Australian Curriculum Assessment and Reporting Authority (ACARA, 2015), which indexes schools based on comparative socioeconomic advantage. Schools were placed on a numerical scale, and schools in YAPS ranged between two standard deviations above and below the state mean.

Pubertal timing was measured in grade 8 using one item, taken from Dubas, Graber, & Peterson (1991), and used in previously published studies (e.g. Modecki, Barber & Vernon, 2013; Abbott and Barber 2010). This item asks: "Teenagers' bodies change a lot as they grow up, this is referred to as your physical development. Compared to other

people your age do you think your physical development has started...’’ with response choices from (1) much later to (5) much earlier. Percentages of responses included: much later (7%); a little later (25%); around the same (47%); a little earlier (16%); and much earlier (5%) than their peers. Mean and (standard deviation) for wave one pubertal timing: $M_{w1} = 2.87 (.92)$. *Sport hours* varied at each wave; thus, a winsorized measure of total hours in sport per week was included in the model as a time-varying covariate. Total hours of participation was assessed at each wave using a question in which adolescents reported: *How many hours per week do you spend in this sport?* Means and (standard deviations) for sports hours: $M_{w1} = 11.00 (8.86)$; $M_{w2} = 12.72 (9.98)$; $M_{w3} = 12.01 (9.60)$; $M_{w4} = 10.66 (9.14)$.

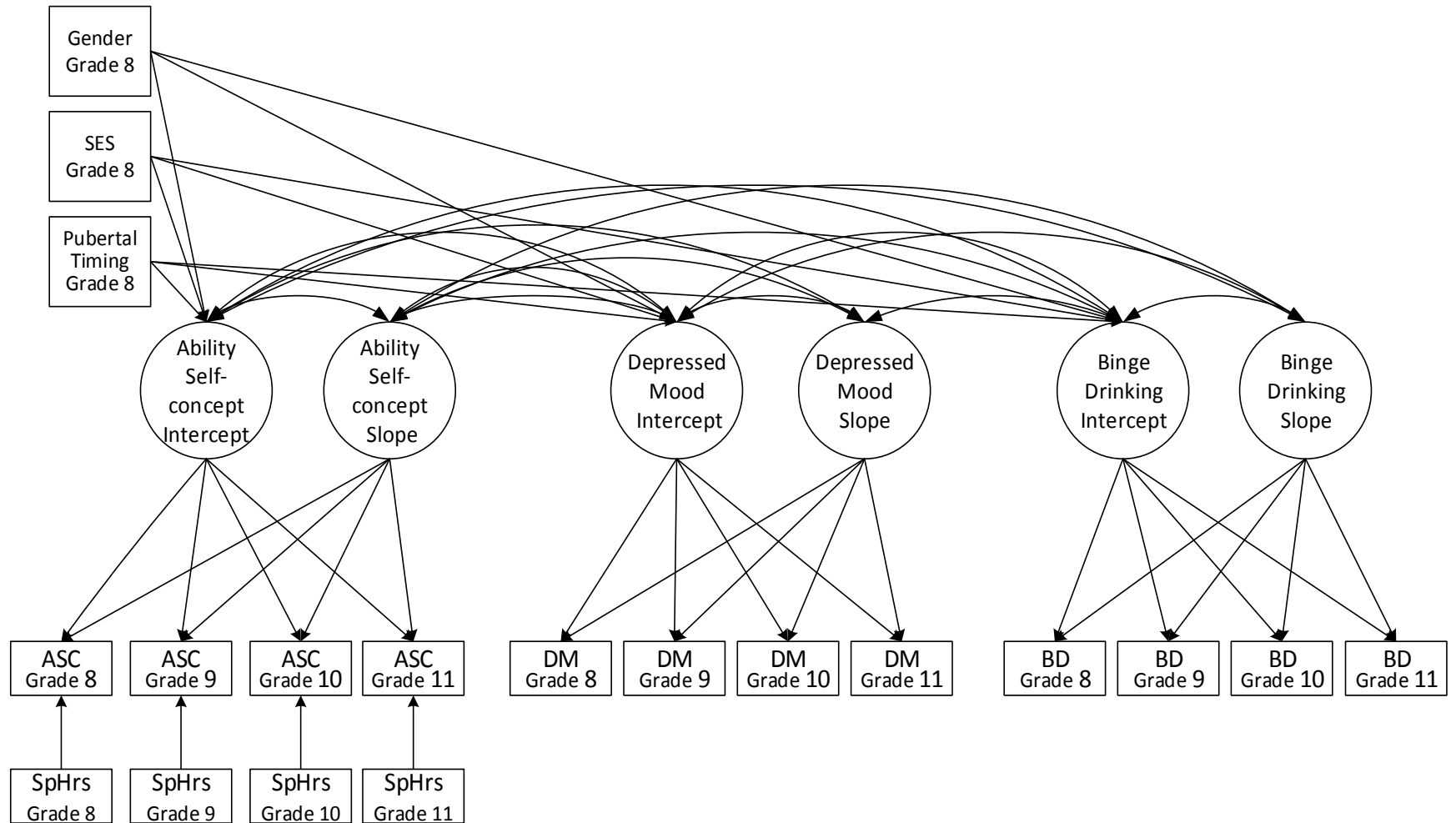
Analytic approach.

Univariate growth curves (LGM) were estimated in order to assess within-person change in ability self-concept, depressed mood, and binge drinking in sport and whether these factors changed together over time. A series of univariate growth curves, parallel process growth curves, and a multivariate growth curve model, were estimated using Mplus version 7.1 (Muthén, & Muthén, 1998-2012) with maximum likelihood estimation robust to non-normality.

Data were analysed in four steps. First, we fit unconditional univariate models of change for each of the three constructs—ability self-concept, depressed mood, and binge drinking—to model early mean levels (intercept) and change (slope) in each variable over time, and associated variability. Second, we estimated a series of conditional models with study covariates. Third, we fit conditional parallel process growth curve models, allowing for correlated intercepts and correlated changes among all possible parallel construct pairs: sport ability self-concept and depressed mood; binge drinking and ability self-concept; and binge drinking and depressed mood. Further, slopes were regressed on intercepts. Parallel process models allowed us to

determine whether any construct pair travelled together over time and whether early levels of one construct predicted subsequent change in another, among adolescent sport participants.

Figure 3-1 Schematic representation of the Multivariate Growth Curve for Ability Self-concept, Depressed Mood, and Binge Drinking in adolescent sport.



Note. ASC = Ability Self-concept, DM = Depressed Mood, BD = Binge Drinking, SpHrs = Sport Hours, SES = Socioeconomic status.

Lastly, as described in Figure 4.1, we modelled all three variables together within a multivariate growth curve. In this final model, intercepts were correlated as were the slopes. Further, all slopes were regressed onto all intercepts. Consequently, this model allowed us to test whether time 1 ability self-concept, depressed mood, and binge drinking predicted subsequent change in the other constructs, accounting for each construct's own subsequent change. All models accounted for the effects of demographic characteristics, with the exception of the unconditional models in step 1, by regressing latent intercept and change factors onto the time-invariant covariates '*gender, SES, and pubertal timing*' and regressing the latent intercept and change factors of ability self-concept onto the time-varying covariate '*sports hours*'.

Results

Univariate Growth Curves.

LGMs were run to examine within-person changes in each construct. Results and model fits for unconditional and conditional models are presented in Table 4.1. The unconditional univariate models are presented in Table 4.1, Model 1. As shown, mean initial levels of binge drinking, ability self-concept, and depressed mood were significantly different from zero. Early levels of ability self-concept were relatively high, intercepts 5.5, indicating that on average adolescents felt they were among the better sport players among their age group. However, early levels of binge drinking were relatively low, equivalent to approximately no binge drinking on average. Similarly, for depressed mood, adolescents rarely reported feeling overwhelmed or upset, on average. There were significant individual differences in initial levels of depressed mood. Further, there were significant linear increases in binge drinking

Table 3-1 Univariate models and effects of covariates on binge drinking, ability self-concept and depressed mood in adolescent sport.

Parameter	Binge Drinking		Sport Ability Self-concept		Depressed Mood	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Fixed effects						
Intercept (Grade 8 mean)	1.05 (0.01)***	1.07 (0.09)***	5.50 (0.06)***	5.43 (0.31)***	2.45 (0.05)***	2.18 (0.26)***
Gender (0=male)		0.01 (0.04)		-0.04 (0.13)		-0.00 (0.11)
SES		-0.00 (0.00)		-0.00 (0.01)		-0.00 (0.01)
Pubertal Timing		0.01 (0.02)		-0.07 (0.07)		0.13 (0.06)*
Sport hours (Time 1)				0.03 (0.00)***		
Sport hours (Time 2)				0.02 (0.00)***		
Sport hours (Time 3)				0.02 (0.00)***		
Sport hours (Time 4)				0.03 (0.00)***		
Linear slope (Time)	0.36 (0.03)***	0.42 (0.15)**	-0.16 (0.04)***	-0.60 (0.21)**	0.06 (0.02)**	1.00 (0.11)
Gender		-0.06 (0.07)		0.06 0 (.07)		-0.06 (0.05)
SES		-0.01 (0.00)*		0.01 (0.01)		0.00 (0.00)
Pubertal Timing		0.06 (0.04)		0.09 (0.04)*		-0.02 (0.03)
Random effect						
Intercept	0.04 (0.03)	0.04 (0.03)	0.78 (0.15)	0.70 (0.12)***	0.44 (0.09)***	0.43 (0.09)***
Linear slope	0.25 (0.04)***	0.24 (0.04)***	0.15 (0.07)*	1.00 (0.05)	0.04 (0.02)**	0.04 (0.01)**
Model Fit Indices						
CFI	0.90	0.88	0.98	0.94	0.97	0.94
RMSEA	0.09	0.08	0.05	0.04	0.05	0.05
SRMR	0.07	0.05	0.06	0.06	0.05	0.05

Note. All conditional models include the time invariant demographic variables, gender, socioeconomic status, and pubertal timing as exogenous covariates, therefore, reported variances are residual variances. The ability self- concept conditional model includes sport hours as a time-varying covariate. CFI = Comparative Fit Index; RMSEA = Root Mean Square of Approximation; SRMR = Standardized Root Mean Square Residual.

* = $p < .05$, ** = $p < .01$, *** = $p < .001$

and depressed mood and significant linear declines in ability self-concept over time.

Moreover, there were significant individual differences in degree of change over time for all three constructs. Table 4.1, Model 2, presents conditional univariate models. Early pubertal timing was associated with higher initial levels of depressed mood and increases in ability self-concept over time. Lower SES was associated with faster increases in binge drinking

across time. Further, the time-covarying sport hours was positively associated with higher ability self-concept at each of the four waves.

Parallel Process Growth Curves

Next, a series of parallel process models assessed associations between paired trajectories. Three parallel process models were estimated to evaluate correlations among early levels (intercepts) and growth (slopes) in binge drinking and ability self-concept; binge drinking and depressed mood; and ability self-concept and depressed mood. Slopes were also regressed on intercepts to determine the effect of early levels of one construct on change in the other construct pair. Table 4.2 presents model fit for each parallel process model pair. Table 4.3 presents intercept-to-intercept and slope-to-slope standardized correlation coefficients, as well as unstandardized intercept-slope regression coefficients for the models. There were significant positive correlations among the slopes for binge drinking and ability self-concept indicating change in binge drinking and ability self-concept changed together over time. Initial lower levels of ability self-concept predicted steeper increases in binge drinking over time indicating that adolescent sport participants who start high in ability self-concept in grade 8 are protected against early high levels of binge drinking. Further, higher initial levels of depressed mood also predicted steeper increases in binge drinking indicating that high early depressed mood is a risk factor for heavy growth in binge drinking.

Table 3-2 Model fit for parallel process models.

Variables	χ^2	CFI	RMSEA	SRMR
Binge drinking & Ability self-concept	150.06***	.86	.06	.07
Binge drinking & Depressed mood	65.13**	.93	.05	.05
Ability self-concept & Depressed mood	107.45**	.93	.04	.06

Note. All models include the demographic variables, gender, socioeconomic status, and pubertal timing as time invariant covariates. Ability self-concept includes sport hours as a time-varying covariate.

* = p<.05, ** = p<.01, *** = p<.001.

Table 3-3 Factor correlations and regression coefficients from the parallel process models.

Factors	Binge drinking		Ability self-concept		Depressed mood	
	Intercept	Slope	Intercept	Slope	Intercept	Slope
Binge drinking						
Intercept						
Slope						
Ability self-concept						
Intercept	-.06	-.12*				
Slope	.18	.37*				
Depressed mood						
Intercept	.23	.22**	.09	-.04		
Slope	-.18	.09	-.08	-.02		

Note. All models include the demographic variables, gender, socioeconomic status, and pubertal timing as time invariant covariates. Ability self-concept includes sport hours as a time-varying covariate. Values are standardized correlation coefficients for correlated intercepts and changes, and unstandardized intercept-slope regression coefficients.

* = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Multivariate Growth Curve

Finally, a multivariate growth curve model was estimated to test whether early ability self-concept, depressed mood, and binge drinking among sport participants predicted subsequent change in the other constructs, accounting for each construct's own change. Correlations between all slopes and between all intercepts were estimated, permitting a test of correlated early levels and correlated changes. Further, all slopes were regressed onto all intercepts, testing whether early levels of one construct predicted subsequent change in another, controlling for change in an important third variable. Model fit was adequate, $\chi^2(302, 126) = 212.23$, $p < .001$, CFI = .89, RMSEA=.05, SRMR=.07. Table 4 presents intercept-to-intercept and slope-to-slope standardized correlation coefficients, as well as the unstandardized intercept-slope regression coefficients.

As can be seen in Table 4.4, none of the intercepts were significantly correlated in the model. Regressing intercepts on slopes indicated that high ability self-concept predicted slower increases in binge drinking over time. Further, high early depressed mood predicted

increases in binge drinking across time. Finally, there was a significant positive correlation among the slopes for binge drinking and ability self-concept (see Table 4.4), indicating that the two changed together over time. Thus, as binge drinking increased over time, decreases in ability self-concept were diminished, controlling for simultaneous change in depressed mood.

Table 3-4 Factor correlations and regression coefficients from the multivariate growth curve model for binge drinking, ability self-concept, and depressed mood.

Factor	Binge drinking		Ability self-concept	
	Intercept	Slope	Intercept	Slope
Binge drinking				
Intercept				
Slope				
Ability self-concept				
Intercept		-.14*		
Slope	.18	.42**		
Depressed mood				
Intercept	.23	.22**	.08	-.03
Slope	-.19	-.01	-.09	.33

Note. Model includes the demographic variables, gender, socioeconomic standing, and pubertal timing as time invariant covariates. Ability self-concept includes sport hours as a time-varying covariate.

Values are standardized correlation coefficients for correlated intercepts and changes, and unstandardized intercept-slope regression coefficients.

* = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Discussion

As extracurricular sport participation is a known risk factor for adolescent binge drinking, identifying potential protective factors associated with binge drinking in sport is central to reducing risk among adolescent athletes. Our approach was to establish how individual differences among athletes - the characteristics that make them unique - may influence their drinking behaviour. This study provides insight into the interplay of the individual motivations of adolescent athletes, and how these are related to an athlete's susceptibility to and protection from binge drinking within the sport context.

First, this study maps change in ability self-concept in the sport context over four years of high school. On average, in eighth grade, the first year of high school, ability self-

concept was high and then declined over the next three years. One likely explanation for the high early levels of ability self-concept could be the fact that the sample consisted entirely of adolescent sport participants, who by virtue of choosing to play sport, perceive themselves as having relatively high competence levels. An alternate explanation could be that developmentally, adolescents early in high school have an inflated sense of their own abilities, as they are only just beginning to compare themselves with their teammates. As a result, they perceive themselves as being better at sport than they actually are.

Importantly, we modelled the development of ability self-concept, accounting for the varying effects of hours spent in sport, across time. This is important because time spent participating in sport is intrinsically tied to self-concept in sport (Slutzky & Simpkins, 2009; Sonstroem, 1997). Our analyses revealed that, in general, greater time spent in sport was associated with higher self-concept. Although male and female athletes did not differ in either their early self-concept or their change in self-concept, nor did self-concept vary based on socio-economic status, adolescent athletes did differ in their development of ability self-concept based on their pubertal timing. Athletes who underwent earlier maturation than their peers were higher in ability-self-concept.

The main study goal was to examine the development of sport ability self-concept and the development of binge drinking together while also controlling for the potential confound of depressed mood. These results showed that athletes high in ability self-concept in eighth grade are protected against increases in binge drinking. Further, adolescents with high initial levels of depressed mood in eighth grade reported more rapid increases in binge drinking across four years, controlling for subsequent change in depressed mood and ability self-concept. Thus, early low levels of ability self-concept and early high levels of depressed

mood among adolescent sport participants may promote accelerations of risk across the high school years.

Our results also assessed parallel change in constructs overtime. Contrary to prediction, binge drinking increased in tandem with increases in ability self-concept, after accounting for change in depressed mood. Thus, these findings suggest that among adolescent sport participants, change in binge drinking goes hand in hand with change in ability self-concept. A possible explanation for this relation is that over time, adolescent athletes are continually comparing themselves with their teammates, with some realizing they are less competent at sport than their peers. This is a normative developmental process. However, here we show this process may contribute to an athlete's binge drinking behaviour declining or at least remaining stable. Similarly, a declining ability self-concept may marginalize athletes and veer them away from the sport culture, possibly leading them to look elsewhere for group acceptance or opportunities to boost their self-esteem and achieve popularity (Epstein, Griffin, & Botvin, 2002). These declines in ability self-concept may also veer them away from sport-related binge drinking.

Looking at it another way, those adolescent athletes who undergo increasing ability self-concept overtime also increase their binge drinking over the high school years. As previously mentioned, these athletes are already high in ability self-concept thus the levels of change are modest. Nonetheless, increases in binge drinking for highly able athletes across the high school years may be a consequence of channelling heavily into their sport drinking culture, binge drinking along with teammates who are also drinking alcohol (Blomfield & Barber, 2010; Eccles & Barber, 1999).

Not only is ability self-concept in sport linked to binge drinking, it is also tied to depressed mood. Here we found that both early high depressed mood and early low ability

self-concept predicted increases in adolescent binge drinking in sport. To disentangle ability self-concept from depressed mood, the depressed mood construct was included in the model as a third important variable, allowing us to examine simultaneous change in all three indicators among adolescent athletes.

As noted above, high ability self-concept at grade eight was protective against increases in binge drinking behaviour. However, these athletes are still susceptible to binge drinking across the high school years. These nuanced results point to the value of modelling these constructs developmentally overtime. Athletes who are increasing albeit modestly, in ability self-concept, are also increasing in their binge drinking across adolescence.

It is important to note that there are also many known benefits associated with extracurricular sport participation during adolescence, including protection against drug use (Eccles, & Barber, 1999; Fredericks, & Eccles, 2006). With this in mind, adolescents sport participation should be encouraged. Nonetheless, for some adolescent athletes, the sport context may be problematic; therefore, efforts are needed to create protective, pro-social norms in these settings.

Although the findings of this study offer insight into predictors of adolescent binge drinking trajectories, some limitations of this study are worth noting. Our sample of Australian adolescent athletes may not be comparable to sport participants in other industrialized countries. Moreover, the population participating in this current study participate in sport voluntarily; therefore, adolescents very low in ability self-concept are probably not being represented in the data, as they most likely did not choose to participate in sport. Further, the variables used in this study were assessed through self-report and may be subject to biases that can accompany a single-informant perspective. Nevertheless, there is ample research to indicate that adolescent self-reports of their experiences in sport are

valid and reliable (Hansen, Larson, & Dworkin, 2003; Larson, Hansen, & Moneta, 2006).

Lastly, although demographic constructs were controlled for in this study, it is possible that some of these variables were in fact moderators of the relations between ability self-concept and binge drinking. Future research could examine, for example, whether gender moderates the relations between ability self-concept and binge drinking.

Conclusion

It is essential to identify factors that place adolescent athletes at an increased risk for binge drinking, especially in a setting known to be problematic. Central to this study are findings that show early low ability self-concept and early high depressed mood predict increases in binge drinking among adolescent sport participants. Even after accounting for the effects of depressed mood, ability self-concept changed in tandem with adolescents' own drinking. That said, athletes vary in their susceptibility to binge drinking, and as this study suggests, some individual differences tied to motivation in sport may counter increases in drinking. Specifically, the motivational construct of sport ability self-concept may protect adolescents from early binge drinking risk. Thus, sport-based interventions for self-concept enhancement, such as development programs focused on confidence building and skills improvement, may provide opportunities for athletes to experience success in sport. With personal improvement may come greater investment in the ability to play at one's best, perhaps reducing the attraction of alcohol use.

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Preface to Chapter 5

Study 2 contributed to greater understanding regarding how ability self-concept can facilitate adolescent athletes' experiences in sport. More specifically, Study 2 revealed that early high levels of sport ability self-concept predicted less steep increases in binge drinking, whereas early high levels of depressed mood predicted greater increases in binge drinking among adolescent athletes. Thus, early high levels of self-concept were protective for adolescents. Importantly, however, developmental increases in ability self-concept paralleled increases in binge drinking, even after accounting for increases in depressed mood. Thus, youth who start high in self-concept are still likely to be vulnerable to binge drinking increases across the high school years, as they "catch up" to their athletic peers with more negative early self-perceptions.

As discussed throughout this thesis, sport is a context known to be problematic for alcohol use, in particular, binge drinking (Lisha, & Sussman, 2009; Mays, DePadilla, Thompson, Kushner, & Windle, 2010; Wichstrom, & Wichstrom, 2009), Study 2 showed that individual differences in the motivational belief of sport ability self-concept is related to changes in binge drinking. Early in high school, high ability self-concept may potentially protect adolescent athletes against early levels of dangerous drinking.

This thesis continues to emphasise the impact the environment has on adolescent development, and how the changing developmental needs of adolescents can interact with attributes of the environment to shape developmental pathways (Eccles & Midgley, 1989; Eccles et al., 1993). Thus this thesis highlights the importance of understanding the dynamics of the sport context, and how the experiences experienced as part of sport participation may vary in their impact for individuals with different characteristics and challenges. For some adolescents, sport participation may make them vulnerable to negative

developmental pathways, including increased likelihood of and escalation in binge drinking. Factors that may exacerbate this risk include characteristics of the sport environment itself, such as risky peers.

Thus in Study 3, the focus turned from protective individual personal attributes among adolescent athletes to those that might exacerbate binge drinking. Again, Study 3 considered individual attributes (personality) in tandem with contextual risks, here with risky peers in sport. Previous research has established that sensation seekers tend to participate in sport and that sensation seeking is a major individual predictor of binge drinking (Donohew, et al., 1999; Quinn, Stappenbeck, & Fromme, 2011). In addition, previous research has also indicated that the sport context is characterized by a higher proportion of peers who drink alcohol, compared to other contexts (Barber, Stone, Hunt, & Eccles, 2005). However, research has yet to explore these three important facets of the adolescent sport environment together, or over time. Thus research has not yet established whether accelerations in binge drinking associated with the adolescent sport context occur as a result of either sensation seeking or affiliation with risky peers, or both.

Study 3 addresses this gap in the literature by investigating the longitudinal trajectories of sensation seeking, risky peers in sport, and binge drinking among adolescent athletes. Modelling all three constructs together, using multivariate growth curve analyses, addresses intra-individual change, as well as associations of change between these three variables. Thus, study 3 investigated whether individual differences in sensation seeking and affiliation with risky peers increased in parallel with escalating binge drinking and whether early levels of risk (i.e. early sensation seeking and early affiliation with risky peers) predicted subsequent binge drinking change among adolescents in extracurricular sports.

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4. CHAPTER FIVE: Study 3

Disentangling development of sensation seeking, risky peers, and binge drinking in adolescent sport.

This chapter includes a co-authored paper. The bibliographic details of the co-authored paper, including all authors, are:

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My contribution to the paper involved:

I collected and prepared the data, formulated the question in collaboration with my co-authors, analysed the data, and drafted the manuscript. My co-authors then reviewed the manuscript draft, suggesting edits.

_____ (Date) 20/09/16
Catherine F Drane

_____ (Date) 20/09/16
Supervisor and Co-author: Dr Kathryn Modecki

_____ (Date) 20/09/16
Supervisor and Co-author: Prof Bonnie Barber

Abstract

Purpose: To describe simultaneous within-person change in adolescent binge drinking, sensation seeking and risky peer affiliation for adolescents in sport across grades 8-10.

Methods: Longitudinal data from 502 adolescent sport participants were analyzed. A multivariate growth curve model tracked early levels and concurrent change in binge drinking, sensation seeking, and risky peers in sports across three years.

Results: Findings revealed that early levels of sensation seeking and risky peers in sport were positively and significantly associated with early levels of binge drinking. Further, early high levels of sensation seeking predicted increases in risky peer associations and binge drinking.

Importantly, developmental increases in risky peer associations paralleled developmental increases in binge drinking, even after accounting for development of sensation seeking.

Conclusions: It is important to identify factors that place adolescents at increased risk for escalations in binge drinking, especially within settings known to be problematic. Sensation seeking is a particularly potent driver of adolescent binge drinking within the extracurricular sport context. Further, accelerations in binge drinking travel hand-in-hand with affiliating with risky peers in sport.

Keywords: Binge drinking; Adolescence; Sensation seeking; Risky peers; Sport.

Disentangling Development of Sensation Seeking, Risky Peer Affiliation, and Binge Drinking in Adolescent Sport.

Binge drinking is pervasive among adolescents and is an important public health concern. Research suggests that approximately 14% of US adolescents have been drunk in the past month and 17% of Australian adolescents binge drink on a monthly basis (Australian Institute of Health and Welfare, 2010; Johnston, O'Malley, Bachman, & Schulenberg, 2012). Generally, binge drinking increases during adolescence and this increase is particularly troublesome given links between adolescent binge drinking and later alcohol-related problems (Kwan, Cairney, Faulkner, & Pullenayegum, 2012). Further, continued alcohol abuse is associated with negative physical and mental health consequences, such as coronary heart disease, aggression, and mood disorders (Brook, Cohen, & Brook, 1998). For this reason, identifying developmental factors that predict increases in binge drinking during adolescence is imperative.

Serious health consequences are associated with binge drinking during adolescence, and certain contexts are believed to increase this risk. In particular, participation in extracurricular sports has been shown to increase adolescents' likelihood of binge drinking (Lisha, & Sussman, 2009; Mays et al., 2010). Illustratively, using latent growth curve analysis, Wichstrom & Wichstrom (2009) demonstrated that initial levels of sport participation predicted growth in binge drinking over time. The link between sport participation and alcohol use is fairly robust (Barber, Eccles, & Stone, 2001; Peck, Vida, & Eccles, 2008). In a recent systematic review, more than 80% of published longitudinal studies reported a significant link between youth sport participation and higher alcohol use (Kwan et al., 2014). This mounting evidence makes clear that supervised, organised sport participation is associated with problematic drinking (Busseri et al., 2010; Eccles, & Barber,

1999). However, research has not adequately identified the processes that explain this growth in problematic drinking among youth sports participants.

There are complementary explanations related to the specific role of sensation seeking and heavy binge drinking in adolescent sport. One is that adolescents who are high in sensation seeking are drawn to sport and these adolescents are also prone to binge drinking. The other is that such risk-seeking participants are drawn together in sporting contexts, and it is the influence of spending time with other risky peers that leads adolescents to engage in and escalate binge drinking. There is evidence for both propositions.

First, there is empirical support for associations between sensation seeking—pursuit of varied, novel, and intense experiences—and alcohol involvement, particularly binge drinking (Wilkinson et al., 2011; Hittner, & Swickert, 2005;). High sensation seekers are also more likely to initiate substance use, such as alcohol use, at an early age and become established users, relative to low (Bates, & Pandina, 1991; Quinn, Stappenbeck, & Fromme, 2011). In fact, sensation seeking is regarded as one of the major individual predictors of adolescent alcohol use and binge drinking (Donohew, et al., 1999; Quinn, Stappenbeck, & Fromme, 2011). This desire to seek out novel and exciting experiences also characterizes adolescents who engage in organized sports (Goma-i-Freixanet, Martha & Muro, 2012; Zuckerman, 2007). Adolescents who participate in sports are higher in sensation seeking than adolescents who do not (Zuckerman, 1994). Thus youth who participate in sports can generally be characterized as sensation seekers, and this high sensation seeking may explain why youth in sports tend to binge drink. Importantly, studies also suggest sensation seeking can be shaped, and as a result should be conceptualized as an individual difference that changes over time (Harden & Tucker-Drob, 2011; Quinn & Harden, 2013). Increases in

sensation seeking during early adolescence are developmentally normative, followed by declines, but there is also considerable heterogeneity in rate and direction of change over time (Harden, & Tucker-Drob, 2011).

Second, associating with risk-taking friends is a complementary explanation for known links between extracurricular sport participation and binge drinking. In general, spending time with risky peers is a risk factor for binge drinking during adolescence. As the number of peers who drink increases in one's network, the risk of binge drinking increases (Costa, Jessor, & Turbin, 1999). For example, using latent growth mixture modelling, Martino and colleagues (2009) found close correspondence over time between heavy drinking and associations with peers who drink. This link between risky peers and binge drinking is important, because extracurricular sport contexts are characterised by a higher proportion of friends who drink than are many other contexts (Barber et al., 2005). As a result, it may be the case that increases in binge drinking among adolescent sport participants are an outgrowth of associations with risky peers, who are likewise drawn to the sport environment.

Involvement in sport exposes adolescents to peers who are themselves embedded within a pro-drinking culture (Mallam, 2006). Participating in sport influences both friend selection and ensconces youth in a culture in which they build shared values with risky peers. As adolescents are heavily influenced by peer norms, beliefs about how much their peers drink, referred to as descriptive drinking norms, represent a major social foundation for binge drinking (Fredricks & Eccles, 2006) and alcohol use (Larimer et al., 2011). Adolescents tend to overestimate their peers' alcohol consumption (Borsari & Carey, 2003), and this may be particularly true in sport, which has positive alcohol norms, including expectations that athletes should drink. These drinking expectations are based on perceptions

of the groups' approval of drinking, known as injunctive norms, and studies show that individuals tend to perceive greater approval of drinking than is actually the case (DeMartini et al., 2011; LaBrie, Napper, & Ghaidarov, 2012).

Collectively, the current study examines the role of these complementary explanations—sensation seeking and risky peers—that may help to explain accelerations in binge drinking among adolescent sport participants. Following adolescents who played sport across grades 8-10, we concurrently modelled early levels and developmental change in sensation seeking, association with risky peers in sports, and binge drinking. We examined whether within-person change in one construct (e.g. risky peers) travelled in tandem with change in another (e.g. binge drinking) controlling for developmental change in a theoretically important third variable (e.g. sensation seeking). Within these models, the predictive effects of early levels of each construct on growth in the others were specified. This approach reveals whether risk factors continue to increase in alignment with escalating binge drinking and whether early levels of risk predict subsequent binge drinking change.

Methods

Participants

Participants were from the Youth Activity Participation Study (YAPS), a longitudinal study of adolescent extracurricular activity involvement and development. Participants were from 34 public (45.9%) and private (54.1%) high schools across Western Australia. Because our study focused on sport participants, only adolescents who participated in sport across three consecutive years were included in analyses. Adolescents were identified as such using a validated measure (Barber, Stone, & Eccles, 2005). At each wave adolescents were asked questions relating to their sport (e.g. risky peers). Longitudinal data were available for 502 adolescents who identified as sport participants (44% male) in eighth grade ($M_{age} = 12.99$,

$SD_{age} = .33$, $Range_{age} = 12 - 14$ years) and continued for the next two years (approximately 37% of the total sample).

Procedure

Ethical approval was obtained from the University Human Research Ethics Committee. Study participation required active informed parent and student consent.

Measures

Scale reliabilities, descriptive statistics, and proportion of sample binge drinking at least once in the previous year, are presented in Table 5.1.

Sensation seeking.

Sensation seeking scale consisted of the mean of three items drawn from the NEO Personality Inventory (Costa, & McCrae, 1992) and measured across three waves. *I often crave excitement; I have sometimes done things just for “kicks” or “thrills”; I like to be where the action is.* Items were measured on a 5-point scale, from 1 ‘strongly disagree’ to 5 ‘strongly agree’. This scale showed validity and was positively associated with impulsivity $r(490) = .522$, $p < .001$).

Binge drinking.

Binge drinking was measured using one item adapted from the Michigan Study of Adolescent and Adult Life Transitions (MSALT), which captures variability in frequencies for both low and high levels of binge drinking. The item asks “*In the past 6 months, how often have you had more than 5 alcoholic drinks on one occasion?*” Responses were rated on an 8-point scale, from 1 =none to 8 =31 or more times. Previous research points to its validity (Kwan et al., 2012; Mays et al., 2010; Modecki, Barber, & Eccles, 2014). The measure showed validity in our sample and was positively associated with illegal drug use $r(490) = .442$, $p < .001$).

Risky peers in sport.

Risky peers in sport scale consisted of the mean of three items adapted from Fredricks and Eccles (2005) and measured across three waves. The peer items include: *What proportion of your friends participating in this sport: Regularly drink alcohol? Regularly use illegal drugs? Likely to skip class?* Items were measured on a 5- point scale; from 1 (none) to 5 (all). Previous research points to the measure's validity (Barber et al., 2005; Eccles et al., 2003) and as expected in our sample, it was negatively associated with prosocial peers $r(154) = -.338, p < .001$.

Socio-economic status (SES).

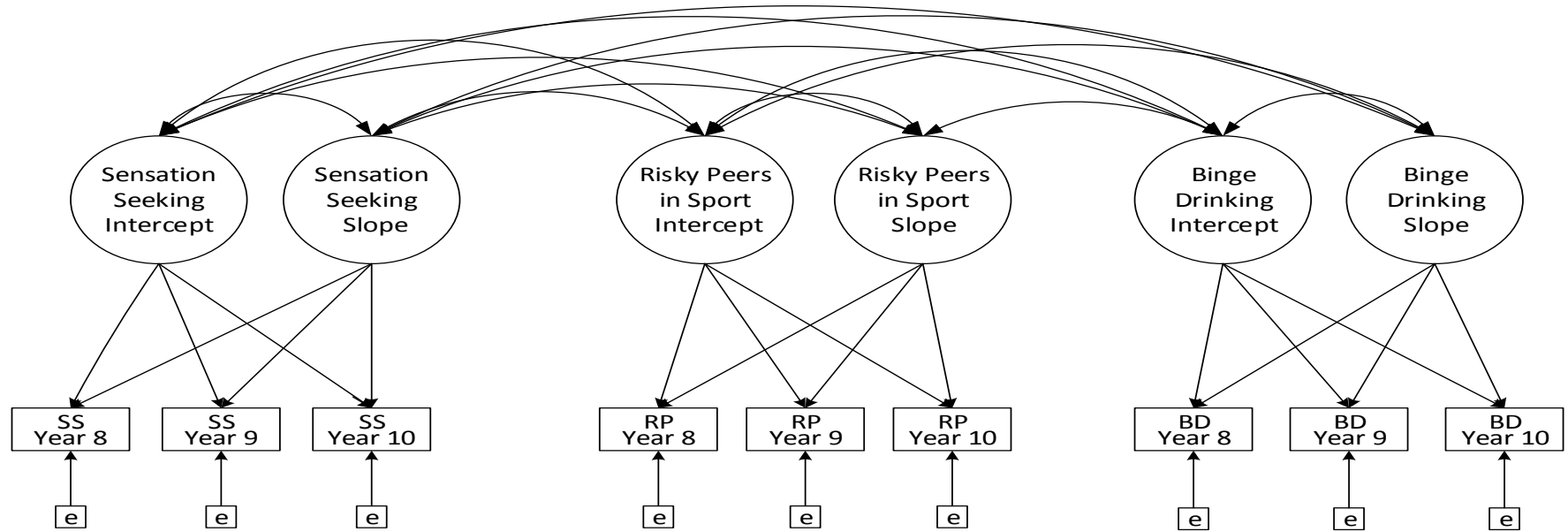
School level SES (Blomfield & Barber, 2011) was obtained from the Index of Community Socio-Educational Advantage (ICSEA). The ICSEA is calculated for each school in the state using data from the Australian Bureau of Statistics, and draws on the education, occupation, income, ethnicity, and single parent status of each student's household (Australian Curriculum, Assessment and Reporting Authority 2015). Schools are assigned a relative score describing their comparative socio-educational advantage and schools ranged from +/- two standard deviations from the state mean.

Analytic approach

In order to assess within-person change in each construct and whether factors change together over time, we estimated a series of latent growth curve models (LGM). Univariate growth curves, parallel process growth curves, and a multivariate growth curve model, were estimated in Mplus v. 7.1 (Muthén, & Muthén, 1998-2012) using maximum likelihood estimation robust to non-normality. Data were analyzed in four steps. First we fit unconditional univariate models of change for each of the three constructs in order to model early mean levels (intercept) and change (slope) in each variable over time, and associated

variability. Second, we estimated a series of conditional models with study covariates. Third, we fit conditional parallel process growth curve models. These models allowed for correlated intercepts and correlated changes among all possible parallel construct pairs and slopes were also regressed on intercepts. Finally, as described in Figure 5.1, we modelled all three variables together within a multivariate growth curve. This model allowed us to test whether time 1 sensation seeking, risky peers in sport, and binge drinking predicted subsequent change in the other constructs, accounting for each construct's own subsequent change. With the exception of the unconditional models, all models accounted for effects of demographics by regressing latent intercept and change factors onto gender and SES.

Figure 4-1 Schematic representation of the Multivariate Growth Curve for Sensation Seeking, Risky Peers, and Binge Drinking in adolescent sport.



Note. SS = Sensation Seeking, RP = Risky Peers, BD = Binge Drinking, e = Error. Model includes the demographic variables gender and socioeconomic status as exogenous covariates.

Table 4-1 Scale reliability and descriptive statistics for sensation seeking, risky peers in sport and binge drinking.

Scale Reliability and Descriptive Statistics			
	Time 1	Time 2	Time 3
Sensation Seeking			
Cronbach Alpha	.70	.81	.79
Mean (Scaled Score)	3.35	3.14	3.23
Standard Deviation	1.52	.96	.92
Risky Peers			
Cronbach Alpha	.66	.78	.77
Mean (Scaled Score)	1.19	1.46	1.82
Standard Deviation	.37	.69	.83
Binge Drinking (1 item)			
Mean	1.09	1.38	1.83
Standard Deviation	.42	.98	1.52
% Binge Drinking	6%	17%	31%

Results

Univariate Growth Curves

To examine within-person changes in each construct, a series of LGMs were run. Results and model fits for unconditional and conditional models are presented in Table 5.2. Model 1, presents the unconditional univariate models. As shown, mean initial levels of each construct were significantly different from zero. Early levels of sensation seeking were relatively high, however, early levels of risky peers and binge drinking were low, equivalent to approximately no risky peers and no binge drinking. There were also significant individual differences in initial levels of risky peers and sensation seeking. Further, there were significant linear increases in proportion of risky peers and binge drinking and significant linear declines in sensation seeking over time. Moreover, there were significant individual differences in degree of change over time for risky peers and binge drinking. Model 2, presents conditional univariate models. Boys and low SES youth

had higher initial levels of risky peers. Low SES was associated with higher initial levels of binge drinking, but slower increases in binge drinking over time.

Parallel Process Growth Curves

Next, a series of parallel process models assessed associations between paired trajectories. Three parallel process models were estimated to evaluate correlations among early levels (intercepts) and growth (slopes) in each of the coupled trajectories. Slopes were regressed on intercepts to determine the effect of early levels of one construct on change in the other. Table 5.3 presents model fits for each parallel process model. Table 5.4 presents intercept-to-intercept and slope-to-slope standardized correlation coefficients, and unstandardized intercept-slope regression coefficients for the models. There were significant positive correlations among intercept and change factors for the binge drinking and risky peer model and the binge drinking and sensation seeking model. Significant positive correlations were found between risky peer and sensation seeking intercepts. In addition, higher initial levels of sensation seeking predicted steeper increases in binge drinking. Higher initial level of sensation seeking also predicted steeper increases in proportion of risky peers across time. Finally, higher initial levels of risky peers predicted steeper increases in binge drinking.

Table 4-2 Univariate models and effects of covariates on risky peers, binge drinking and sensation seeking in adolescent sport.

	Risky Peers		Binge Drinking		Sensation Seeking	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
<i>Fixed effects</i>						
Intercept (Grade 8 mean)	1.14 (.02)***	1.21 (.05)***	1.09 (.02)***	1.18 (.06)***	3.40 (.06)***	3.49 (.15)***
Gender (0=male)		.02 (.04)		.06 (.04)		.06 (.11)
SES		-.00 (.00)		-.01 (.00)*		-.00 (.00)
Linear slope (Time)	.32 (.02)***	.34 (.05)***	.34 (.03)***	.60 (.08)***	-.19 (.07)**	-.34 (.28)
Gender		.02 (.04)		-.03 (.06)		-.04 (.15)
SES		-.00 (.00)		-.01 (.00)***		.00 (.02)
<i>Random effects</i>						
Intercept	.10 (.04)**	.10 (.04)**	.16(.08)	.15 (.08)	.33 (.05)***	.33 (.05)***
Linear slope	1 (.02)***	.10 (.02)***	.24 (.06)***	.23 (.06)***	.22 (.16)	.34 (.61)
CFI	.98	.98	.95	.95	.99	.90
RMSEA	.06	.04	.07	.05	.03	.12
SRMR	.02	.02	.02	.02	.03	.03

Note. All conditional models include the demographic variables, gender and socioeconomic status, as exogenous covariates, therefore, reported variances are residual variances. CFI = Comparative Fit Index; RMSEA = Root Mean Square of Approximation; SRMR = Standardized Root Mean Square Residual.

* = $p < .05$, ** = $p < .01$, *** = $p < .001$

Table 4-3 Model fit for parallel process models.

Overall Model Fit for Parallel Process models				
Variables	χ^2	CFI	RMSE A	SRMR
Sensation Seeking & Binge Drinking	24.24*	.97	.04	.04
Risky Peers & Binge Drinking	37.68**	.93	.06	.04
Sensation Seeking & Risky Peers	46.78***	.93	.07	.04

Note. All models include the demographic variables, gender and socioeconomic status, as covariates.
 * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Table 4-4 Factor Correlations and Regression Coefficients from the Parallel Process Models.

Factors	Sensation Seeking		Risky Peers		Binge Drinking	
	Intercept	Slope	Intercept	Slope	Intercept	Slope
Sensation Seeking						
Intercept						
Slope						
Risky Peers						
Intercept	.43***	-.06				
Slope	.14**	.36				
Binge Drinking						
Intercept	.16*	.03	.29***	.01		
Slope	.39***	.21	.50**	.78***		

Note. All models include the demographic variables, gender and socioeconomic status, as covariates.
 Values are standardized correlation coefficients for correlated intercepts and changes, and unstandardized intercept-slope regression coefficients. * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Multivariate Growth Curve

Finally, a multivariate growth curve model was estimated to test whether early sensation seeking, association with risky peers in sport, and binge drinking predicted subsequent change in the other constructs, accounting for each construct's own change. All slopes were correlated as were all intercepts, permitting a test of all correlated changes. Further, all slopes were regressed onto all intercepts, testing whether early levels of one construct predicted subsequent change in another, controlling for change in an important third variable. Table 5.5 presents intercept-to-intercept and slope-to-slope correlation coefficients, intercept-slope regression coefficients, as well as model fit. R^2 for the latent variables shows that the intercepts for sensation seeking, risky

peers, and binge drinking accounted for 6.5%, 6.5% and 2.5% respectively, of the proportion of the shared variance, indicating small effects. The proportion of shared variance for the slopes of sensation seeking, risky peers, and binge drinking accounted for 6.5%, 11.3% and 31.1% respectively, indicating small effects for sensation seeking and risky peers, and a large effect for binge drinking.

There were significant correlations among intercept and change factors (see Table 5.5). Initial levels of the three constructs were positively associated, indicating that higher levels of one construct were associated with higher levels of the other two. Thus, higher early levels of sensation seeking were associated with a greater proportion of risky peers in sport and higher binge drinking. Further, slopes were positively correlated for binge drinking and risky peers, indicating that as binge drinking increased over time, youth spent time with a greater proportion of risky peers, controlling for simultaneous change in sensation seeking. Moreover, higher initial levels of sensation seeking predicted steeper increases in binge drinking over time and predicted greater increases in the proportion of risky peers in sport.

Table 4-5 Factor Correlations and Regression Coefficients from the Multivariate Growth Curve Model for Sensation Seeking, Risky Peers, and Binge Drinking.

Factor	Sensation Seeking		Risky Peers	
	Intercept	Slope	Intercept	Slope
Sensation Seeking				
Intercept				
Slope				
Risky Peers				
Intercept	.42***	-.04		
Slope	.15**	.34		
Binge Drinking				
Intercept	.17*	-.01	.33**	.03
Slope	.33***	.25	.27	.77***
Model Fit				
	χ^2	CFI	RMSEA	SRMR
SS, RP, BD	80.73***	.93	.06	.04

Note. Model includes the demographic variables, gender and socioeconomic standing, as covariates. Values are standardized correlation coefficients for correlated intercepts and changes, and unstandardized Intercept-slope regression coefficients. SS = Sensation Seeking, RP = Risky Peers, BD = Binge Drinking. * = $p < .05$, ** = $p < .01$, *** = $p < .001$.

Discussion

One well-established risk factor for adolescent binge drinking is extracurricular sport participation. However, previous research has not disentangled whether, within sporting contexts, high rates of binge drinking are due to personality, due to associations with risky peers, or due to both. Establishing a temporal order of increased drinking, sensation seeking and risky peer exposure is especially difficult, as reciprocal relations are likely. By examining simultaneous change in all three indicators among adolescents participating in sport, this study offers important insight into the dynamic circumstances under which this context can promote dangerous drinking.

Our multivariate results show that adolescent athletes with early high levels of sensation seeking demonstrated more rapid increases in binge drinking across three years, controlling for subsequent changes in sensation seeking and in association with risky peers in sport. Further, youth with higher initial sensation seeking reported more rapid increases in their risky peer associations, albeit with a small effect size, again controlling for sensation seeking change and binge drinking change. These results make clear that early sensation seeking among youth sport participants can promote the acceleration of risk across the early high school years. That being said, the multivariate model also showed that escalations in binge drinking occurred in tandem with escalations in risky peer associations. Thus, among youth sport participants, accelerations in binge drinking go hand-in-hand with affiliation with risky sporting peers. Importantly, our model showed a large effect size for binge drinking. Of course, there was still remaining variance to be explained. Further models should thus include other putative drivers of adolescent binge drinking, including peer norms, both injunctive and subjective, and peer sensation seeking. In all, these results suggest that prevention programs to mitigate binge drinking among sport participants should be

tailored to high sensation seeking youth (Donohew et al., 2000). Further, in that upsurges among the two are connected, addressing problematic peer norms in sporting contexts is arguably another useful target to limit accelerations in problematic drinking.

We also presented two notable findings from our univariate and parallel process models. First, within the univariate models, although binge drinking and association with risky peers increased over the course of three years, sensation seeking decreased. Previous research investigating sensation seeking over the course of adolescence has generally reported increases, or else a curvilinear pattern of change (Harden & Tucker-Drob, 2011; Steinberg et al., 2008). The most likely explanation for our finding of decline is that as sport participants, youth were relatively high sensation seekers to begin with (Roberti, 2004; Zuckerman, 1994). Second, within the paired developmental trajectories, when sensation seeking was not taken into account, early risky peers in sport were associated with escalations in binge drinking over time. This finding dropped away in our multivariate model and highlights the importance of assessing binge drinking trajectories together, with both risky peer associations and sensation seeking. To provide an accurate account of early predictors and correlates of growth in adolescent binge drinking, scholars need to address the interplay between personality and risky peer affiliation, with problem drinking.

Implications

This study is the first to examine simultaneous relations between growth in binge drinking, sensation seeking, and risky peers within the context of adolescent sport participation. As a result, our findings have implications for prevention of adolescent binge drinking more generally, in addition to informing alcohol prevention efforts within the context of extra-curricular sports. Study results substantiate the influence of early sensation seeking on binge drinking (Quinn, Stappenbeck, & Fromme, 2011).

Notably within a context that is known for dangerous drinking, our results demonstrate a robust association between this personality facet and increased risk for problems. Early high levels of sensation seeking were associated with increasingly problematic peer associations and also escalations in binge drinking across the early high school years. These results also highlight powerful ties between the development of adolescent binge drinking and risky peers in sport. Even after controlling for demographics and changes in sensation seeking, we found substantial support for correlated change in risky peer associations and binge drinking.

Why do risky peers in sport have such pernicious links to binge drinking? One explanation is that we began following adolescents soon after their transition to high school. This is a key period for forming and cultivating peer groups (Wigfield, Byrnes, & Eccles, 2006). During this transition, sport participation may be an important pathway to establishing a peer network, providing a ready-made peer group which connects adolescent athletes with sporting peers, leading to opportunities to both play sport and socialise, further enhancing the potential for peer influence. Some of these sport peers may be characterized by high sensation seeking (Roberti, 2004) and also a propensity to drink alcohol (Modecki et al., 2014). Once integrated into a risky peer group, adolescents may further socialise with each other around heavy drinking (Centifanti et al., 2014) so that peer risk and binge drinking remain coupled.

Although study findings offer important insight into adolescent binge drinking they must be considered in light of several limitations. Our sample of Australian adolescent athletes may not be comparable to those in other industrialized countries. Moreover, it is possible that risky peers and sensation seekers choose to congregate in particular types of sports such as those with high levels of physical contact, and therefore risks may not be uniform across sports. Additionally, we used a single item

measure of binge drinking. Although there is good evidence of its validity (Kwan et al., 2012; Mays et al., 2010; Modecki, et al, 2014), future research could improve upon its use by further including a definition of ‘drink’ and consider using a continuous indicator of number of recent drinking episodes.

It is important to identify factors that place adolescents at increased risk for escalations in binge drinking, especially within settings that are known for problems. Our results indicate that sensation seeking may be a particularly potent driver of adolescent binge drinking within the context of extracurricular sport. A key finding from this study is that early sensation seeking drives increases in binge drinking among adolescent sport participants. Even accounting for the effects of sensation seeking, association with risky peers changed in tandem with adolescents’ own drinking. Programs that target excitement-based motivations to drink (Conrod et al., 2011) and bolster positive, prosocial peer norms may be especially useful for guarding against escalations in binge drinking among youth sport participants.

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5. CHAPTER SIX: General Discussion

Sport, and participation in and enjoyment of sport, is a defining characteristic of many cultures throughout the world, including in Australia. Much time, effort and resources are funnelled into sport here and elsewhere and Australian adolescents spend considerable discretionary time participating in sport. Proponents of sport generally suggest that sport participation is good for everyone, and it is not uncommon for parents, teachers and coaches to encourage adolescents to join sports teams. Among the perceived benefits of sport for youth are physical activity, confidence, teamwork, and persistence. However, there are aspects of sport that are also cause for concern, especially those that could undermine healthy adolescent development.

Guided by the aims presented in Chapters 3, 4, and 5, this research has made three primary contributions to understanding the nature of the relationship between adolescents and their sports participations. The first aim of this thesis was to examine whether motivations, such as attainment value and ability self-concept, were related to positive developmental experiences in sport. Chapter 3 highlighted the importance of a fit between the individual and their environment as predicted in the person-environment fit theory. When adolescents are engaged in their sport, because it is important to them and they think they're good at it, it provides opportunities for positive experiences, such as, doing sport-related identity work and experiencing flow in sport. The second aim was to examine whether individual attributes of athletes, such as low ability self-concept and depressed mood, represent vulnerabilities to risk behaviour, such as binge drinking. Study 2, as noted in Chapter 4, examined the degree to which sport ability self-concept and depressed mood affected the developmental course of binge drinking. Little prior research has identified individual attributes of the athlete that predict individual differences in trajectories of binge drinking and this study offered insights

into two such attributes. Building on results from Study 2, the third aim sought to establish whether the interplay between the individual attribute of sensation seeking, and the risky peer context might influence adolescent athletes own risk taking, in the form of binge drinking. Thus, Study 3, examined whether accelerations in binge drinking among adolescent athletes were predicted by and changed in tandem with, sensation seeking or risky sporting peers, or both. Overall, the empirical studies presented in Chapters 3, 4 and 5 demonstrate the complexities embedded in sport participation as a context for development. As a whole, these results extend previous research to identify individual differences among adolescent athletes that serve to promote positive experiences in sport for some, and increase vulnerabilities to risk for others. They also have theoretical and practical implications which will be discussed in this chapter, followed by a consideration of the study's limitations and suggestions for future directions.

The overarching premise of this thesis was that there are mutually influential bidirectional relations between the developing adolescent and their changing extracurricular context. These individual↔context relations regulate the course of development, that is, its pace, direction, and outcomes (Lerner, Lerner, von Eye, Bowers & Lewin-Bizan, 2011). This potential for change is a fundamental strength of the adolescent developmental period. However, an appreciation for such developmental plasticity reminds us that change can occur for better or for worse and can contribute to an adolescent's trajectory (Lerner, Lerner, von Eye, Bowers & Lewin-Bizan, 2011). Indeed, adolescents respond differently to different contexts depending on the individual characteristics they bring with them. The developing adolescent is learning how to navigate this world with all of its complexities, developing knowledge, skills, and values, but is not always equipped to manage different kinds of contexts, especially

ones that might be challenging. Although adolescents are agentic, they are still embedded in, and subject to their environment, an environment made up of different systems with different rules and values (Lerner & Lerner, 1989; 1983). How successfully an adolescent navigates these contexts will depend largely upon their individual characteristics and attributes, which was the primary focus of this research.

To address missing data in the three studies, full information maximum likelihood (FIML) was used. All three samples had less than 10% missing data and FIML has been shown to produce unbiased parameter estimates and standard errors with these rates of missingness (Enders & Bandalos, 2001). This is a low rate of missingness for a multiple-year longitudinal study, and represents benefit to the studies having only included participants who participated in sport for one year (Study 1), four years (Study 2) and three years (Study 3). On the one hand, this is a strength of the thesis, as it captures athletes who persist in sport. On the other hand, the sample might also be viewed as a limitation, as the study designs fail to capture participants who move in and out of sport.

Review of Aims and Key Findings

Aim 1. To examine whether motivations, such as attainment value and ability self-concept, were related to positive developmental experiences in sport.

Often we think of sport in terms of the positive experiences and outcomes that come from participating in sport, such as enjoyment, increased self-esteem and academic functioning. Adolescents are generally encouraged to participate in sport because of the physical and health benefits associated with being active and fit. However, in terms of psychological benefits from playing sport, only some children are likely to benefit. The idea here is that participation doesn't automatically guarantee favourable outcomes. For example, Lerner and Overton (2008) make clear that it is

important to identify the best way to align an individual's strengths with resources for positive development in their present context, as both individual and context change.

In order to better understand why only some adolescents benefit from playing extracurricular sport, Study 1 (Chapter 3) examined individual differences in motivations among adolescent athletes, and whether these differences were related to positive experiences in sport for some athletes. Specifically, athletes who placed greater importance on their sport and had higher perceptions of their sport ability had more frequent positive developmental experiences of identity and flow. That is, findings from Study 1 suggest that value and perceived sport ability play an important role in adolescents' level of engagement in sport. Adolescents who are psychologically engaged reap the benefits, in this case the benefits involve forming an identity linked to being an athlete and experiencing flow.

Based on the person-environment fit theory, which highlights the importance of a fit between the needs of the individual and their environment, Study 1 confirms the importance of this match between motivations of the individual and the sport context. Consistent with research demonstrating the importance of a self-concept aligned well to the context, when adolescents valued their sport and believed that they were good at it, then their motivations were aligned well with their sport. As a consequence, their experiences in sport tended to be more positive. Study 1 also showed that for older adolescents, this relation depended to some degree on how much they participated in sport. That is, the more hours spent playing sport, the stronger the relations between value and experiences. It makes sense that those who highly valued their sport might spend more time immersed in it, and as a consequence of fit, have more positive experiences. A somewhat unexpected finding for older adolescents was that those who perceived their sport competence as high had more identity-related experiences at low

levels of participation. It is possible that older adolescents, who may be time poor due to other commitments, who perceive their sport ability as high, do not need to spend a lot of time playing sport to identify as an athlete. Nonetheless, at high intensity, regardless of self-concept, more identity experiences were reported than at low intensity.

Understanding factors associated with positive experiences in sport is important, because one of the primary tasks of adolescence is to form identities, evidenced by the progression from exploration to commitment, and sport provides a salient context for this process to occur. In fact, identity formation provides one of the strongest foundations for positive development (Hardy & Kisling, 2006). As adolescents' secondary schooling has become increasingly structured, there are fewer opportunities for exploring different identities within the school system. Voluntary extracurricular sport activities, however, can provide opportunities to reflect on and explore one's athletic identity. Although previous research has noted that the sport context may not be as strongly supportive of identity work as some other activities are, for example, drama and church groups (Hansen, Larson & Dworkin, 2003; Larson, Hansen & Moneta, 2006), Study 1 provides evidence for the role sport can play in forming an identity, if motivations are well aligned.

Alongside the identity formation process is the experience of flow. As Larson points out, sport is a context conducive to experiencing flow (Larson, 2000). Sport is conducive because it can continually challenge the individual and thus recurrently require them to improve their skill levels to meet a new level of demand. Additionally, adolescents will need to learn to be motivated by and to enjoy work – that is to experience flow in these settings – in order to facilitate their thriving as adults. Sport can potentially provide such an environment that is conducive to motivation, challenge and attention (Kleiber, Larson, & Csikszentmihalyi, 1986).

Study 1 provides further support for the notion that sport can be a context for experiencing flow (Jackson & Eklund, 2002; Jackson, Ford, Kimiecik, & Marsh, 1998). However, it was the athletes who valued their sport and who perceived their competence as high, who reported having the most experiences of flow. Indeed, the flow state results when both challenge and skills are high and is thus characterised as being intrinsically rewarding. Moreover, experiencing flow in sport fits well with the propositions of Self-Determination Theory (SDT), which highlights the role of intrinsic motivations, and the capacity to develop skills and capabilities, both of which are known to be a necessary requirement for experiencing flow. According to SDT, challenging oneself is adaptive, and is associated with increasing competencies (Deci & Ryan, 1985). Study 1 showed that adolescents with high perceived ability or competencies, had more flow experiences in sport. Although this association has been previously identified in adult and elite athlete populations (Jackson et al., 2001), this study is the first to show the link in an adolescent sample. Thus, Study 1 contributes to the flow literature by establishing the association between perceived ability and flow experiences within a heterogeneous sample of adolescent athletes.

Overall, Study 1 highlights the positive role that sport can play in facilitating positive youth development. That is, if adolescents are fully engaged in sport, then sport can be a context that promotes general well-being. It is important for adolescents to develop the skills and competencies required for a productive adult life as well as learn to deal with and manage adversity, and sport provides a context for building these skills. Indeed, it is not about being devoid of challenges and risks but rather limiting them (Pittman, 1990). As Pittman, (1990) articulated, 'it's not about being problem free but fully prepared', that is, fully prepared for life challenges, fully prepared for adult life. However, Pittman (2003) emphasises that it is equally important for adolescents to be

fully participating or engaged in what they do, whether school, work or leisure activities, to thrive and have positive experiences.

Importantly, one of the distinguishing features of extracurricular sport activities is that they are voluntary in most cases and so adolescents choose to participate in them. With this choice arguably comes a certain amount of engagement, as long as the motivations behind the choice are aligned with the chosen sport. The expectancy-value theory states that choice, persistence and performance can be explained by motivation, that is, value and competency beliefs. Study 1 has shown that athletes high in motivation – value and ability beliefs – experienced more beneficial outcomes than those lower in motivation. If motivations are not aligned well, and adolescents are not fully engaged, then the positive outcomes are less certain. However, development is complex, and is the result of the interplay between individual and context. As a result, it is not only the athlete and their individual attributes that matter, but also the context itself. For example, an adolescent can be motivated and fully engaged in their chosen sport so that there is the potential for positive experiences, but the sport context itself may also contain elements that are potentially risky. As development is ongoing, an adolescent is still acquiring all the necessary skills to navigate such an environment successfully.

Aim 2. To examine whether individual attributes of athletes, such as ability self-concept and depressed mood, promote vulnerabilities to risk behaviour, such as binge drinking.

Adolescents follow their own unique developmental pathways, which involve dynamic exchanges between the individual and their context. These exchanges result in shifting fit or congruence between developmental characteristics of the adolescent and their context and provide the basis for both consonance and dissonance in their environment. Furthermore, the plasticity that results from these individual↔context

interactions can be the basis for variations in positive and negative developmental change (Lerner & Lerner, 1989; 1983). Study 1 showed that when there is congruency or a fit between the individual↔context relations, positive developmental experiences can result.

Furthermore, Study 2 showed that congruency between the individual↔context relations, that is, a fit between motivation and the sport context, can lead to increased risk for some adolescents, and protection from risk for others. Study 2 provided further support for the notion that sport participation is a risk factor for increased alcohol use, particularly binge drinking (Busseri et al., 2010; Eccles, & Barber, 1999). However less is known about the specific factors (both risk factors and protective factors) associated with such binge drinking for adolescent athletes. In order to identify these factors, Study 2 examined the developmental course of adolescent binge drinking in sport over time. As a way of understanding the impact of individual attributes on adolescent binge drinking among athletes, Study 2 mapped development of a motivational construct (ability self-concept) in tandem with change in binge drinking across four years, controlling for depressed mood - a possible confound. Here, as an extension to Study 1, where high perceived sport ability was associated with positive experiences in sport, Study 2 examined whether low perceived sport ability might be a risk factor for binge drinking among athletes. In particular, adolescents low in ability self-concept are arguably increasingly susceptible to risk, because they may be having fewer affirming experiences in sport. The results for Study 2 revealed that adolescent athletes at the beginning of high school (grade 8) who started low in ability self-concept reported accelerations of risk across the 4 years. Athletes low in ability self-concept are likely not as motivated in their sport and not as fully engaged, relative to those athletes with high ability self-concept. Because this lack of engagement is incongruent, or a poor fit

with the sport context, it may set these athletes up for vulnerabilities to risk. Conversely, adolescents who perceived their sport ability as high in grade 8 were protected against normative increases in binge drinking. In other words, if adolescents believed they were good at sport in grade 8, the outcome was more positive and was protective against escalations in binge drinking. Again, this research shows an important developmental fit for those athletes who thought they were good at sport. It may be the case that it is more important for athletes who perceive their ability as high to focus on being as healthy as possible to support their sport performance, and they may thus view binge drinking as potentially undermining their performance. Alcohol intake can negatively impact on psychomotor skills essential for successful exercise performance and this would be a deterrent for drinking alcohol for many athletes. It may also be the case that athletes with high perceived ability are the elite athletes who by virtue of strict schedules and regimens, may not have the time or freedom to drink alcohol. Conversely, this may explain why some athletes consume alcohol in binges, as they are limited by these strict schedules and regimens to the number of occasions they can drink.

At the start of high school, it is normative for adolescents to have an inflated sense of their own abilities and it is also normative for there to be declines in ability self-concept across the high school years (Fredricks and Eccles, 2002). Results from Study 2 are thus in line with previous research, showing ability self-concept started high and declined across the next 3 years. That said, if adolescents with low perceived ability are playing a sport consistently over four years, it is not entirely clear what might be their motivation for persisting when they do not deem themselves to be highly competent. One possible explanation is that these adolescents are being influenced to stay in sport by other factors, such as hanging out with their friends. Although peers were not included as a consideration in Study 2, peers could be one potential

explanation for why adolescents with a low ability self-concept continue to participate in sport. Indeed, adolescents are highly vulnerable to peer influences (Kandel et al., 1978) and peer acceptance is important to them (Terry-McElrath et al., 2009). Hanging out with sport friends and joining in with binge drinking is one way to achieve such acceptance from peers and may override the disincentives arising from a low self-concept of sport ability.

Although Study 1 and Study 2 show that a fit between motivations and the sport context can lead to positive outcomes or can protect from risk, a match between individual and context is not always beneficial. For example, some adolescents may fit “well” within risky contexts that are congruent with their own individual characteristics and friendship preferences. Here, for example, congruence may be achieved when adolescents spend time with their risky friends in sport drinking alcohol, and this may especially be the case for those adolescents who do not believe they are especially good at sport. Thus, rather than conceptualizing congruence in sport as uniformly positive, it is also important to consider that it may exacerbate risk for some youth who find a “match” with risky peers who are also involved in sport.

Aim 3. To establish whether accelerations in binge drinking among adolescent athletes occur as a result of, or in tandem with, sensation seeking or risky sporting peers, or both.

Building on results from Study 2, Study 3 examined the interplay between risky peer associations, personality (sensation seeking), and binge drinking in the context of sport. Here, Study 3 results further substantiated the link between sensation seeking, and alcohol use, and did so in the context of adolescent sport participants (Crawford et al., 2003; Harden & Tucker-Drob, 2011; Quinn & Paige Harden, 2013; Quinn et al., 2011). That is, high levels of sensation seeking in grade 8 was associated with increasingly problematic peer associations and also escalations in binge drinking across several years

of high school. Importantly, even after accounting for the effects of sensation seeking, association with risky peers changed in parallel with adolescents' own drinking, highlighting the influence peers had on each other's binge drinking behaviour within the context of the adolescent sport environment.

As Study 3 demonstrates, sport participation can expose adolescents to peers who are themselves embedded within a drinking culture, a culture in which drinking is considered both normative and well-accepted (Lisha & Sussman, 2010). It is well established that adolescent drinking is tied to perceptions of group conduct, including perceptions of peers' drinking. Among adolescents, peer social acceptance is highly important and social norms serve a basic social function to distinguish who is in the group and who is considered an outsider (Reynolds, Subasic & Tindall, 2015). As one example, if adolescents perceive that their peers in sport consider binge drinking to be appropriate, then one way to establish group membership is to join in binge drinking. Further, risky peers in sport then become a salient reference group and both articulated and unspoken rules and norms of the group can ultimately shape binge drinking behaviours. Study 3 is an example of how congruence can lead adolescent athletes to have agency to undertake risk taking. In this case, congruence was in the form of having a sensation seeking personality and associating with risky sporting friends. The results in Study 3 are consistent with previous literature linking sensation seeking and binge drinking in the sport context (Quinn, Stappenbeck, & Fromme, 2011), and also peers and binge drinking in the sport context (Mays, DePadilla, Thompson, Kushner, & Windle, 2010). Yet the unique contribution of this research is that it is the first study to do so using change trajectories over time, linking all three constructs together. Given that adolescent sport is a known risk factor for binge drinking, addressing this gap represents an important addition to the literature. Indeed, previous research has not

been able to determine which construct influenced binge drinking or whether they might both have influence, initially or over time among adolescents in sport. This research shows that sensation seeking is especially salient to binge drinking in the sport context, even when accounting for the effects of risky peers in sport.

Given that both high sensation seeking individuals and risky peers tend to be found in the adolescent sport environment, it is important to consider the issue of self-selection for binge drinking in sport. It may be the case that adolescents who would be more likely to binge drink choose to participate in sport because it offers opportunities to engage in binge drinking. That said, continued participation may also drive further binge drinking. Although Study 3 cannot disentangle these questions, it does speak to the role of personality and peers in the sport environment as especially likely to exacerbate adolescents' risk for binge drinking

Limitations

While this thesis offers a number of noteworthy contributions, results should also be considered in the context of its limitations. First, one limitation concerns the cross-sectional nature of the data used in Study 1, such that it is not possible to determine causality. Further, although the preferred structural equation model fit the data well, alternate equivalent models were not estimated. Thus, Study 1 could not determine the direction of effects. For instance, it is plausible that a reciprocal relationship exists such that adolescents who have high levels of positive experiences in sport may begin to value their sport more and as a result begin to perceive themselves as being good at their sport. That said, a strength of this thesis was the use of longitudinal data in Studies 2 and 3. Longitudinal data were used to better investigate the influence of individual differences on binge drinking among sport participants. More specifically, in Studies 2 and 3, multivariate growth curve analyses were used to measure

simultaneous within-person change of the constructs in order to obtain initial levels of the constructs and their rate of change over time.

Second, another limitation of this thesis concerns selection effects. Some adolescents may be drawn both to sports and to problematic peers who engage in risk behaviour, such as binge drinking. Indeed, sensation seeking adolescents may self-select into sport because they are drawn to their binge drinking peers, rather than being drawn to sport per se. While the study cannot fully account for such selection effects, it does begin to unpack the various roles of these constructs within-person, for those youth who remain in sport over a number of years. This is merely a starting point, however. Generally, selection effects are an inherent problem for research concerning adolescent involvement in leisure activities (Barber, Abbott, Blomfield, & Eccles, 2009; Mahoney, 2000) and sport activities are no exception. The basis of this methodological problem concerns voluntary participation, for which random assignment is not possible. Discretionary activities have self-selection as a necessary condition (Holland & Andre, 1987). The effects of self-selection are minimized in this thesis, in Study 2 and 3, through the statistical control of multiple confounds, as well as the use of longitudinal data. Yet it is important to note that this thesis is only about athletes who persist in sport. Therefore, conclusions cannot be made regarding adolescents who drop out of sport or who did not participate in the first place. Thus, adolescents who found the sport context to be completely irrelevant or less relevant to their identity, development, or contextual fit would not have been included in any of the studies that comprised this thesis.

Third, as many adolescents participate in multiple sport activities (as well as other organised activities) over the course of a year, it is challenging to design a study that can attribute learning or behaviours to a single activity. For example, it is possible that prior experience in sport or other activities may affect motivations in sport. Likewise, engaging in multiple activities at the same time can influence long term

motivations. Consequently, the fact multiple participation patterns were not controlled for in the three studies should be kept in mind and represents a limitation of this thesis. Further, as shown in this thesis, sport can be associated with both positive and unfavourable outcomes. One reason for the possible differences in outcomes may be a result of the philosophies and goals of youth sport and the quality of specific coaching can vary significantly among sporting contexts (Feldman and Majasko, 2005). Coaches can play a role in influencing an adolescent's sport experience. Not all coaches consider an athlete's developmental stages nor their psychological and social best interests. Bronfenbrenner's (1999) model suggests that sport can provide an optimal setting for positive youth development, however, poor program design and negative coaching can hinder rather than enhance positive youth development. With this in mind, adolescents' outcomes may vary based on the quality of the sport setting, and a limitation of this thesis is the lack of control for sport quality in the three studies. Future research would do well not only to control for multiple participation patterns but also the quality of the sport setting.

Fourth, there were other limitations to the sample which influence the generalizability of the findings. For example, homogeneity of the sample in terms of ethnicity is one issue, as the majority of adolescents identified as Caucasian. Thus, results may not generalize to adolescents of other ethnicities. Australian population data shows notable differences among adolescents from different ethnic backgrounds in their rate of involvement in activities, such as sport (Australian Bureau of Statistics, 2012). Thus, participants from non-Caucasian ethnic backgrounds may choose not to participate in sport and are therefore not represented in this sample. Furthermore, the effect of participation in leisure activities, such as sport, on developmental outcomes also appears to vary for youth from different ethnic backgrounds (Fredricks &

Simpkins, 2012; Gerber, 1996). As a result, findings may not generalize to adolescent athletes of other ethnicities.

Fifth, the diversity of the sample may have been limited as a result of the method used to recruit participants. The method of informed-consent from parents may have led to an under-representation of adolescents from economically disadvantaged backgrounds. Although the sample of schools selected for the study was stratified by a socio-economic index, the return rate of parental consent is typically lower at schools with lower SES indices. Further, the need to gain parental consent to participate may have resulted in a bias toward youth with positive characteristics (reliable, with engaged parents, higher initiative).

Six and finally, the variables used in this study were assessed through self-report and may be subject to biases that can accompany a single-informant perspective. However, in terms of motivation, and personality, adolescents are best equipped to report on their own views. Further, it is perceptions of peer norms that are most likely to drive behavioural choices rather than peers actual level of drinking (Baer & Carney, 1993). Therefore, self-report was generally an appropriate methodological choice for this research.

Future Directions

This thesis has provided an examination of how individual differences can promote positive developmental experiences for some and influence vulnerabilities to risk for others. As a result, a number of areas requiring further investigation have been identified. Much of the research on sport participation has focused on the contexts of participation (e.g., comparing those in sport to those in arts, or non-participants). Far less research has investigated the mechanisms in these contexts influencing development. Bronfenbrenner (1999) suggested that proximal processes or the

relationship between the environment and the developing person are the key to development. Considerably more research is required to understand the processes which may be responsible for the differences we see in the activity participation literature when contexts are compared. A shift in focus from contexts to processes will allow a more thorough and detailed understanding of the mechanisms underlying benefits and risks of adolescent sport participation. Uncovering aspects of sport participation that are most important to positive development. Future research could assess psychosocial and/or behavioural pathways (mediating effects) that might help uncover the mechanisms through which sport participation effects binge drinking. One such example, as an extension of Study 2, could be to examine the mediating effects of depressed mood on the relations between self-concept and binge drinking. Additionally as an extension of Study 3, examining if sensation seeking and peers might explain why sport participation is associated with binge drinking.

Further, given the robustness of the association between sport participation and risk, it is crucial to better understand the reasons behind why sport participants appear to be at greater risk for binge drinking when compared to adolescents who do not participate in sport. This thesis has begun to address this gap in the literature by examining trajectories of binge drinking with motivation, personality, and risky peers. Until we understand the potential risk factors at both personal and social levels, it is unlikely we will be able to implement interventions to address these problems.

Conclusion

This thesis provides a thorough examination of the role of individual differences in promoting positive experiences in sport for some adolescents and in increasing vulnerabilities to risk for others. The majority of research on extracurricular sport has focused on the contexts of activity participation, with far less research investigating the

developmental processes that occur in relation to these outcomes. This thesis has begun to address this gap in the literature by examining individual differences in motivation, personality (sensation seeking), and the sport peer context as a way of identifying different pathways towards thriving and risk for adolescent athletes.

Essential for healthy adolescent development is a supportive environment that fits the needs of the young person (Eccles, et al., 1993). The sporting context is a match for some youth and not for others. Educators and sporting organisations that design and implement sport programs for adolescents must avoid a one size fits all approach. This thesis has shown the importance of considering individual differences among adolescent athletes, such as motives and personality, for promoting thriving and protecting against risk.

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Appendix A: Youth Activity Participation Study

Youth Activity Participation Survey Western Australia 2009

Thank you for choosing to participate in this survey. As the survey is completely confidential please try and answer all the questions as openly and honestly as you can. If you do not feel comfortable answering any of the questions please feel free to leave them blank.



ID Number ✍ _____

Date of Birth (dd/mm/yy) ✍ _____ / _____ / _____

What year are you in at school? Year 9 Year 10 Year 11 Year 12

If you are in Year 12, how many T.E.E. subjects are you doing? ✍ _____

Do you board (live) at your school? Yes No

What is your gender? Male Female

What suburb/town do you live in? ✍ _____ Post Code: ✍ _____

What education have your parents **completed**?
(Please tick all boxes that apply for each parent.)

Mother	Father	
<input type="checkbox"/>	<input type="checkbox"/>	Did not finish High School
<input type="checkbox"/>	<input type="checkbox"/>	Finished High School
<input type="checkbox"/>	<input type="checkbox"/>	Finished University

Youth Activity Participation Survey – Western Australia

Section A – Sports Participation

Q1) Have you participated in any **organised school sports /teams** outside of physical education classes in this school year? (Please circle all the sports you do and indicate how many hours per week you participate in each of the sports you have selected).

If you don't participate in any school-based sports please go onto the next page.

Example:

Activity	Approx hrs/week
Hockey	3 hrs per week

School-Based Sports (not Phys Ed)

Activity	Approx hrs/wk	Activity	Approx hrs/wk
<u>SPORTS</u>			
Athletics		Rugby	
Basketball		Soccer	
Cricket		Softball	
Cycling		Swimming/Diving	
Football (AFL)		Tennis	
Hockey		Touch Rugby	
Netball		Volleyball	
Other (please specify) ✍		Other (please specify) ✍	

Q2) Have you participated in any of the following **organised sports outside of school** in this school year? (*Please circle all the activities you do and indicate how many hours per week you participate in each of the activities you have selected*).

If you don't participate in any out-of-school-based sports please go onto the next page.

Example:

Activity	Approx hrs/week
Soccer	1.5 hrs per week

Out-of-School Sports

Activity	Approx hrs/wk	Activity	Approx hrs/wk
<u>SPORTS</u>			
Athletics		Horse riding/Pony club	
Baseball		Karate/Taekwondo	
Basketball		Netball	
BMX		Rugby	
Body Boarding		Soccer	
Boxing		Squash	
Cricket		Surfing	
Cycling		Swimming/Diving	
Football (AFL)		Tennis	
Golf		Touch Rugby	
Gymnastics		Volleyball	
Hockey		Other (please specify) 	
Other (please specify) 		Other (please specify) 	

Q3) Please specify which sporting activity you spend the most time in
 (If you do not participate in any sporting activities please go to section B on page 10)

 _____

Q4) Is this a school-based activity? (e.g. school team)

Yes No

Q5) How many hours per week (*not including school time*) do you spend in this activity?

 _____ Hours

Not currently active (not participating right now, for example the sport is out of season)

Q6) How many months/years have you been participating in this activity?

 _____ Years  _____ Months

Q7) Do you participate in this activity on your own or with a group of other people around your age?

On my own

In a group

Q8) Other participants in this activity are

The same sex as me

A mixture of boys and girls

Q9) How much time do you spend interacting with an adult during this activity?
 (Circle one)

None of The time	a little of the time	2	3	4	all of the time	5
1						

The following questions are related to the sporting activity you chose in question 3.

Q10) Based on your involvement in this activity please rate whether you have had the following experiences by ticking the appropriate box.

	1 Not At All	2 A Little	3 Quite A Bit	4 Yes, Definitely
Was able to experience the challenges of being a leader				
This activity got me thinking about who I am				
Tried doing new things				
Learned I had a lot in common with youth from different backgrounds				
Tried a new way of acting around people				
I do things in this activity I don't get to do anywhere else				
Started thinking more about my future because of this activity				
I felt like what I did made a difference				
Experienced feeling liked by others in this activity				
Others in this activity counted on me				
This activity has stressed me out				
I learned to control my temper				
This activity has been a positive turning point in my life				
Became better at dealing with fear and worry				
Had an opportunity to be in charge of a group of peers				
I set goals for myself in this activity				
When I start something in this activity I always try my best to finish it				
Had to consider possible obstacles when making plans				
Got to know people in the community				
I made friends with someone new				
I put all my energy into this activity				
Had the chance to push myself				
Had to focus my attention				
Became better at handling stress				
Worked with other people my own age on a common goal				
Had experiences with organizing time and not procrastinating (not putting things off)				

	1 Not At All	2 A Little	3 Quite A Bit	4 Yes, Definitely
Learned about setting priorities				
Practiced self-discipline				
Made friends with someone from a different ethnic or cultural group				
Had to find ways to achieve my goals				
I have been successful in this activity				
Felt like I didn't belong in this activity				
Came to feel more supported by the community				
In this activity I saw that hard work pays off				
When this activity is difficult I keep trying anyway				
Learned to get along with others				
Made friends with someone from a different social class (someone from a family who were more or less well off than my family)				
I regularly achieve what I aim to in this activity				
This activity has given me many opportunities to improve my abilities				
Came to feel more a part of my community				
I felt like what I did mattered				

Q11) The following questions are about the adult leader in your sport; if your sport does not involve an adult leader please go onto question 12.

The adult leader in this activity.....	1 Not At All	2 A Little	3 Quite A Bit	4 Yes, Definitely
Encourages me to always try my best				
Supports me when I am having difficulties				
Puts too much pressure on me during this activity				
Makes me feel like I can succeed in this activity				
Listens to my point of view				
Puts me down in front of others in this activity				
Creates a strong positive environment				

Q12) How true for you are the following statements about your parents, when participating in your sport?

I worry about letting my parents down when I play this sport.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

My parents and I have fun going to my games/competitions.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

No matter how well I do in my sport, my parents don't think its good enough.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

This sport has improved my relationship with my parents.

Not at all Yes, definitely
1 _____ 2 _____ 3 _____ 4 _____ 5

My parents get upset with me when I don't do well in this sport.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

This sport interfered with doing things with my family.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

My parents support or help me with this sport.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

How pleased do you think your parents are with how well you are doing in your sport this year?

Not at all pleased Extremely pleased
1 _____ 2 _____ 3 _____ 4 _____ 5

Q 13) Please read the following statements about your sport and respond by circling one number.

How important is it to you to be good at this sport?

not at all important very important
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

How much do you enjoy participating in this sport?

a little a lot
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

Compared to other kids your age, how good do you feel you are at this sport?

One of the Worst One of the best
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

Participating in this sport gives me a strong feeling that this is who I am

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

During this sport I feel so involved that nothing seems to matter

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

During this sport I have a very high level of concentration

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

I become so involved in this sport that I lose track of time

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

I concentrate so intensely that I can't think about anything else

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

Q14) What proportion of your friends participating in this sporting activity are...

Planning to go to university? (*Circle one number*)

none half all
1 2 3 4 5

Doing very well in school?

none half all
1 2 3 4 5

Encourage you to do your best in school?

none half all
1 2 3 4 5

Regularly drink alcohol?

none half all
1 2 3 4 5

Regularly use illegal drugs?

none half all
1 2 3 4 5

Likely to skip class?

none half all
1 2 3 4 5

More than one year older than you?

none half all
1 2 3 4 5

Section B – Activity Participation





Q15) Which of the following **activities or clubs at school** have you participated in this school year outside of school classes? (*Please circle all the activities you do and indicate how many hours per week you participate in each of the activities you have selected*).

If you don't participate in any school-based activities go to the next page.

Example:

Activity	Approx hrs/week
<u>Drama</u>	4 hrs per week

School-Based Activities & Clubs

Activity	Approx hrs/wk	Activity	Approx hrs/wk
<u>Arts and Performing Arts</u>			
Art		Youth and health festival	
Band or Orchestra		Modeling	
Choir		Music lessons (please specify)	
Dance			
Drama		Other (please specify)	
Rock – Eisteddfod			
<u>Clubs</u>			
Chess club		School committee	
Service clubs		School council	
Computer game club		Debate club/Public speaking	
Other (please specify) 		Other (please specify) 	





Q16) Have you participated in any of the following **activities or clubs outside of school** in this school year? (*Please circle all the activities you do and indicate how many hours per week you participate in each of the activities you have selected*).

If you don't participate in any out-of-school activities go onto the next page.

Example:

Activity	Approx hrs/week
Cadets	2.5 hrs per week

Out-of-School Activities & Clubs

Activity	Approx hrs/wk	Activity	Approx hrs/wk
<u>Arts and Performing Arts</u>			
Community band		Dance club/competitions	
Private band		Music lessons (Please specify) 	
Drama club		Other (Please Specify) 	
<u>Recreational Clubs</u>			
Computer gaming/ networking		Other (Please specify) 	
<u>Service Clubs</u>			
Cadets		Surf life saving	
Church/Youth groups		Volunteer/service work	
Scouts/Girls, Boys Clubs		Other (Please Specify) 	

Q17) If you have circled any non-sporting activities please tell us which one you spend the most time in.
(If you do not participate in any non-sporting activities please go to Section C on page 18)

 _____

Q18) Is this a school-based activity? (e.g. school team)

Yes No

Q19) How many hours per week (not including school time) do you spend in this activity?

 _____ Hours

Not currently active (not participating at this time)

Q20) How many months/years have you been participating in this activity?

 _____ Years  _____ Months

Q21) Do you participate in this activity on your own or with a group of other people around your age?

On my own

In a group

Q22) Other participants in this activity are

The same sex as me

A mixture of boys and girls

Q23) How much time do you spend interacting with an adult during this activity?

(Circle one)

None of The time	a little of the time				all of the time
1	2	3	4	5	

The following questions are related to the non-sporting activity you chose in question 17.

Q24) Based on your involvement in this activity please rate whether you have had the following experiences by ticking the appropriate box.

	1 Not At All	2 A Little	3 Quite A Bit	4 Yes, Definitely
Was able to experience the challenges of being a leader				
This activity got me thinking about who I am				
Tried doing new things				
Learned I had a lot in common with youth from different backgrounds				
Tried a new way of acting around people				
I do things in this activity I don't get to do anywhere else				
Started thinking more about my future because of this activity				
I felt like what I did made a difference				
Experienced feeling liked by others in this activity				
Others in this activity counted on me				
This activity has stressed me out				
I learned to control my temper				
This activity has been a positive turning point in my life				
Became better at dealing with fear and worry				
Had an opportunity to be in charge of a group of peers				
I set goals for myself in this activity				
When I start something in this activity I always try my best to finish it				
Had to consider possible obstacles when making plans				
Got to know people in the community				
I made friends with someone new				
I put all my energy into this activity				
Had the chance to push myself				
Had to focus my attention				
Became better at handling stress				
Worked with other people my own age on a common goal				
Had experiences with organizing time and not procrastinating (not putting things off)				

	1 Not At All	2 A Little	3 Quite A Bit	4 Yes, Definitely
Learned about setting priorities				
Practiced self-discipline				
Made friends with someone from a different ethnic or cultural group				
Had to find ways to achieve my goals				
I have been successful in this activity				
Felt like I didn't belong in this activity				
Came to feel more supported by the community				
In this activity I saw that hard work pays off				
When this activity is difficult I keep trying anyway				
Learned to get along with others				
Made friends with someone from a different social class (someone from a family who were more or less well off than my family)				
I regularly achieve what I aim to in this activity				
This activity has given me many opportunities to improve my abilities				
Came to feel more a part of my community				
I felt like what I did mattered				

Q25) The following questions are about the adult leader in your activity; if your activity does not involve an adult leader please go onto question 26.

The adult leader in this activity.....	1 Not At All	2 A Little	3 Quite A Bit	4 Yes, Definitely
Encourages me to always try my best				
Supports me when I am having difficulties				
Puts too much pressure on me during this activity				
Makes me feel like I can succeed in this activity				
Listens to my point of view				
Puts me down in front of others in this activity				
Creates a strong positive environment				

Q26) How true for you are the following statements about your parents, when participating in your activity?

I worry about letting my parents down when I play this activity.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

My parents and I have fun going to my performances/ club activities.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

No matter how well I do in my activity, my parents don't think its good enough.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

This activity has improved my relationship with my parents.

Not at all Yes, definitely
1 _____ 2 _____ 3 _____ 4 _____ 5

My parents get upset with me when I don't do well in this activity.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

This activity interfered with doing things with my family.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

My parents support or help me with this activity.

Not at all true for me Very true for me
1 _____ 2 _____ 3 _____ 4 _____ 5

How pleased do you think your parents are with how well you are doing in your activity this year?

Not at all pleased Extremely pleased
1 _____ 2 _____ 3 _____ 4 _____ 5

Q27) Please read the following statements about your non-sporting activity and respond by circling one number.

How important is it to you to be good at this activity?

not at all important very important
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

How much do you enjoy participating in this activity?

a little a lot
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

Compared to other kids your age, how good do you feel you are at this activity?

One of the Worst One of the Best
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

Participating in this activity gives me a strong feeling that this is who I am

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

During this activity I feel so involved that nothing seems to matter

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

During this activity I have a very high level of concentration

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

I become so involved in this activity that I lose track of time

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

I concentrate so intensely that I can't think about anything else

Never Always
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7

Q28) What proportion of your friends participating in this activity are...

Planning to go to university? (*Circle one number*)

none half all
1 2 3 4 5

Doing very well in school?

none half all
1 2 3 4 5

Encourage you to do your best in school?

none half all
1 2 3 4 5

Regularly drink alcohol?

none half all
1 2 3 4 5

Regularly use illegal drugs?

none half all
1 2 3 4 5

Likely to skip class?

none half all
1 2 3 4 5

More than one year older than you?

none half all
1 2 3 4 5

Please go on to Section D on Page 19 

Section C – Your Friends

Only answer the following questions if you do not participate in any sporting or non-sporting activities and have skipped sections A & B.

If you have answered sections A & B please go onto section D on page 19

Q29) What proportion of your friends are...

Planning to go to university? (*Circle one number*)

none		half		all
1	2	3	4	5

Doing very well in school?

none		half		all
1	2	3	4	5

Encourage you to do your best in school?

none		half		all
1	2	3	4	5

Regularly drink alcohol?

none		half		all
1	2	3	4	5

Regularly use illegal drugs?

none		half		all
1	2	3	4	5

Likely to skip class?







none		half		all
1	2	3	4	5

More than one year older than you?

none		half		all
1	2	3	4	5

Section D

Q30) If you participate in any of the following activities outside of school hours please tell us how many hours per week you spend in each activity?

How many hours per week do you spend in each of these activities?	Hours per week
Paid Work (part time/casual job, not including work from parents)	
Doing homework or studying (outside of school)	
Home chores (doing dishes, cleaning)	
Taking care of younger siblings	
Practicing or playing a musical instrument	
Watching Television	
Working out or physical activity (on your own or at the gym, not as a part of an organised sports activity) Please Specify  _____	
Computer Console Gaming (Playstation, X-Box etc) Which game do you play the most?  _____	
Internet Gaming (online games) Which one do you play the most?  _____	
Internet Usage – Social Networking (webchat, MySpace) Which one do you use the most?  _____	
Internet Usage – Other (downloading music, ebay) Please specify  _____	
Hobbies (model making, scrapbooking etc) What hobbies do you do the most?  _____	

Section E – About You

Q31) Please read the following statements and rate how true each statement is for you. (Circle one number)

I feel really good about the way I look

Not at all true for me Very true for me
1 2 3 4 5

Overall I am satisfied with my physical abilities

Not at all true for me Very true for me
1 2 3 4 5

I feel really good about what I can do physically

Not at all true for me Very true for me
1 2 3 4 5

I am very happy with the appearance of my body

Not at all true for me Very true for me
1 2 3 4 5

Overall I am satisfied with my appearance

Not at all true for me Very true for me
1 2 3 4 5

I am very happy with my performance in physical activities

Not at all true for me Very true for me
1 2 3 4 5

Section F

Q32) Please read the following statements and rate how true each statement is for you. (Circle one number)

I am very good at making friends

Not at all true for me
1 2 3 4 5 6
Very true for me

If I don't understand something in class I know I am capable of learning it

Not at all true for me
1 2 3 4 5 6
Very true for me

I am able to do most things very well

Not at all true for me
1 2 3 4 5 6
Very true for me

If I work really hard I could be one of the best students in my school year

Not at all true for me
1 2 3 4 5 6
Very true for me

I am always comfortable talking to other people my age

Not at all true for me
1 2 3 4 5 6
Very true for me

A lot of things about me are good

Not at all true for me
1 2 3 4 5 6
Very true for me

I have the ability to be good at most school subjects if I try

Not at all true for me
1 2 3 4 5 6
Very true for me

If I really try I can be good at almost anything I want to

Not at all true for me Very true for me
1 2 3 4 5 6

It is important to me to do well in school

Not at all true for me Very true for me
1 2 3 4 5 6

I have a lot to be proud of

Not at all true for me Very true for me
1 2 3 4 5 6

I always feel like I am part of a group of friends

Not at all true for me Very true for me
1 2 3 4 5 6

Q33) How often are the following statements true for you?

I like the way things are going for me.

Never Almost always
1 2 3 4 5 6

My life is going well.

Never Almost always
1 2 3 4 5 6

I would like to change many things about my life.

Never Almost always
1 2 3 4 5 6

I have a good life.

Never Almost always
1 2 3 4 5 6

I feel good about what's happening to me.

Never Almost always
1 2 3 4 5 6

Q33) How often do you.....

Feel good about yourself? (*Circle one number*)

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Lose your appetite or eat a lot when you get upset?

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Feel that difficulties are piling up so high that you can't overcome them?

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Feel satisfied with who you are?

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Feel that you are capable of coping with most of your problems?

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Feel lonely?

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Keep a cool head in emergencies?

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Feel sure about yourself?

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Feel unhappy, sad or depressed?

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Feel there is nothing nice you can look forward to?

never
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ daily
6

Section G – You and School

Q34) Please rate how true the following statements are for you. (Circle one number)

How much do you like school?

Not at all A lot
 1 2 3 4 5 6 7

I feel like I really belong in my school

Not at all true for me Very true for me
 1 2 3 4 5

School is interesting

Not at all true for me Very true for me
 1 2 3 4 5

I feel that working hard at school is a waste of my time

Not at all true for me Very true for me
 1 2 3 4 5

I enjoy school activities

Not at all true for me Very true for me
 1 2 3 4 5

I would like to leave school as soon as I can

Not at all true for me Very true for me
 1 2 3 4 5

I believe that succeeding at school is important

Not at all true for me Very true for me
 1 2 3 4 5

I look forward to going to school

Not at all true for me Very true for me
 1 2 3 4 5

I know that school can be boring but I try hard anyway because it will lead to better opportunities for me in the future

Not at all true for me Very true for me
 1 2 3 4 5

Q35) How likely is it that you will go to university after high school?

Not at all
Likely
1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7
Extremely
Likely

Section H – About Your Friends

Q36) Please answer the following questions about your friends (circle one number)

My friends treat me well

Not at all
true for me
1 _____ 2 _____ 3 _____ 4 _____ 5
Very true
for me

I wish I had different friends

Not at all
true for me
1 _____ 2 _____ 3 _____ 4 _____ 5
Very true
for me

My friends are great.

Not at all
true for me
1 _____ 2 _____ 3 _____ 4 _____ 5
Very true
for me

My friends are nice to me.

Not at all
true for me
1 _____ 2 _____ 3 _____ 4 _____ 5
Very true
for me

Compared to other teenagers in your school, how popular are you?

Least
Popular
1 _____ 2 _____ 3 _____ 4 _____ 5
Most
Popular

Section I – About Your Family

Q37) Please answer the following questions about your family. (Circle one number)

I enjoy being at home with my family.

Not at all true for me				Very true for me
1	2	3	4	5

My family gets along well together.

Not at all true for me				Very true for me
1	2	3	4	5

I like spending time with my parents.

Not at all true for me				Very true for me
1	2	3	4	5

My parents and I do fun things together.

Not at all true for me				Very true for me
1	2	3	4	5

Section J

Q38) Have you ever created your own profile online that others can see, like on a social networking site like Myspace, Bebo, or Facebook (This does not include MSN/Yahoo)?

No skip questions below; go to **Section K, Page 30**

Yes answer the questions below.

What is the profile you use, or update most often? _____

How long have you had your profile? _____

Answer the following questions about the profile (Myspace/Bebo/Facebook) you use the most often. Please tick the applicable answer.

Q39) Is your profile set to public or private?

- Public Private

Q40) About how often do you visit your profile?

- Never
- Less than once a month
- Every few weeks
- 1-2 days a week
- 3-5 days a week
- About once a day
- Several times a day

Q41) How often do you change your profile (e.g. change status, change personal information, add photos)?

- Never
- Less than once a month
- Every few weeks
- 1-2 days a week
- 3-5 days a week
- About once a day
- Several times a day

Q42) Is any of the personal information (e.g. interests, etc) you have on your profile not true?

- Yes No

How often do you use Myspace/Bebo/Facebook etc to:

Make new friends (*please select one*)

- Never
- Less than once a month
- Every few weeks
- 1-2 days a week
- 3-5 days a week
- About once a day
- Several times a day

Stay in touch with friends you rarely see in person (*please select one*)

- Never
- Less than once a month
- Every few weeks
- 1-2 days a week
- 3-5 days a week
- About once a day
- Several times a day

Make plans with your friends (*please select one*)

- Never
- Less than once a month
- Every few weeks
- 1-2 days a week
- 3-5 days a week

- About once a day
- Several times a day

Flirt with someone (*please select one*)

- Never
- Less than once a month
- Every few weeks
- 1-2 days a week
- 3-5 days a week
- About once a day
- Several times a day

Q43) How important is it to you to have a lot of friends on your network?

Not at all important Very important

1 2 3 4 5

Q44) How many friends do you have on your profile? ✍️ _____

Q45) Compared to other people your age with a profile, how many friends on do you have?

- A lot less than others
- A little less than others
- About the same as others
- A bit more than others
- A lot more than others

Q46) Have you ever deleted a friend? (*Do not include 'Tom' from MySpace*)

- Yes No

Q47) How often do you usually communicate online with friends you met on the internet, who you didn't know from before?

- Never
- Less than once a month
- Every few weeks
- 1-2 days a week
- 3-5 days a week
- About once a day
- Several times a day

Q48) How much do you agree/disagree with the following statements?

Myspace/Bebo/Facebook has become part of my daily routine.

Completely disagree Completely agree

1 2 3 4 5

I feel out of touch when I haven't logged on to Myspace/Bebo/Facebook.

Completely
disagree

1

2

3

4

Completely
agree

5

Section K

Q49) The following questions ask you about behaviors that may be considered risky, if you are uncomfortable answering any of the questions feel free to leave them blank.

About how often in the last 6 months have you **drunk alcohol?** *(Tick one box for each question)*

none once 2-3
times 4-6
times 7-10
times 11-20
times 21-30
times 31 or
more
times

About how often in the last 6 months have you **had more than 5 alcoholic drinks on one occasion?**

none once 2-3
times 4-6
times 7-10
times 11-20
times 21-30
times 31 or
more
times

About how often in the last 6 months have you **been drunk?**

none once 2-3
times 4-6
times 7-10
times 11-20
times 21-30
times 31 or
more
times

About how often in the last 6 months have you **used illegal drugs?**

none once 2-3
times 4-6
times 7-10
times 11-20
times 21-30
times 31 or
more
times

About how often in the last 6 months have you **skipped school without parent permission?**

none once 2-3
times 4-6
times 7-10
times 11-20
times 21-30
times 31 or
more
times

About how often in the last 6 months have you **done something you knew was dangerous just for the thrill of it?**

none once 2-3
times 4-6
times 7-10
times 11-20
times 21-30
times 31 or
more
times

About how often in the last 6 months have you **damaged public property?**

none once 2-3
times 4-6
times 7-10
times 11-20
times 21-30
times 31 or
more
times

About how often in the last 6 months have you **had contact with police for something you did or something they thought you did?** (Tick one box for each question)

none	once	2-3 times	4-6 times	7-10 times	11-20 times	21-30 times	31 or more times
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About how often in the last 6 months have you **gotten suspended from school?**

none	once	2-3 times	4-6 times	7-10 times	11-20 times	21-30 times	31 or more times
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About how often in the last 6 months have you **done some pretty risky things because you thought it was a kick?**

none	once	2-3 times	4-6 times	7-10 times	11-20 times	21-30 times	31 or more times
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About how often in the last 6 months have you **gotten in a physical fight with another person?**

none	once	2-3 times	4-6 times	7-10 times	11-20 times	21-30 times	31 or more times
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About how often in the last 6 months have you **cheated on an exam, or copied someone else's homework?**

none	once	2-3 times	4-6 times	7-10 times	11-20 times	21-30 times	31 or more times
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About how often in the last 6 months have you **taken something from a store without paying for it?**

none	once	2-3 times	4-6 times	7-10 times	11-20 times	21-30 times	31 or more times
------	------	--------------	--------------	---------------	----------------	----------------	------------------------

About how often in the last 6 months have you **taken money from home that was not your own without asking?**

none	once	2-3 times	4-6 times	7-10 times	11-20 times	21-30 times	31 or more times
------	------	--------------	--------------	---------------	----------------	----------------	------------------------

About how often in the last 6 months have you **not used your seatbelt in a car?**

none	once	2-3 times	4-6 times	7-10 times	11-20 times	21-30 times	31 or more times
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Section L

Q50) How would you describe your family background? *(Tick all that apply)*

- Caucasian (Anglo-Australian, European or American)
- Aboriginal/Torres Strait Islander
- Asian
- Middle Eastern
- African
- Other (please specify) ✍ _____

In what country were you born? ✍ _____

If born outside Australia how old were you when you moved here? ✍ _____

In what country was your father born? ✍ _____

In what country was your mother born? ✍ _____

Q51) Are your parents?

- Married and living together all the time
- Divorced
- Married and living together but one works away a lot of the time (fly in-fly out)
- Single/ sole parent (never married)
- Living together in a marriage-like relationship
- Widowed/widower (parent(s) passed away)
- Separated

Does your father work for pay? Yes No

If your father is currently employed, what does he do in his job? ✍ _____

Does your mother work for pay? Yes No


If your mother is currently employed, what does she do in her job? ✍ _____

Q52) How much do you weigh? ✍ _____ **What is your height?** ✍ _____

Section M

Q54) Please read each item carefully and circle the answer that best corresponds to your agreement or disagreement:

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
I lose my temper easily.	SD	D	N	A	SA
I often get involved in things I later wish I could get out of.	SD	D	N	A	SA
I often act without stopping to think.	SD	D	N	A	SA
I have sometimes done things just for “kicks” or “thrills”.	SD	D	N	A	SA
I like to be where the action is.	SD	D	N	A	SA
It takes a lot to get me angry.	SD	D	N	A	SA
I often crave excitement.	SD	D	N	A	SA
I try to do jobs carefully, so they won’t have to be done again.	SD	D	N	A	SA
When a project gets too difficult, I’m inclined to start a new one.	SD	D	N	A	SA
I usually work quickly without bothering to check	SD	D	N	A	SA
Sometimes I’m not as dependable or reliable as I should be.	SD	D	N	A	SA
I’d have to be really sick before I’d miss a day of school.	SD	D	N	A	SA
I work hard to accomplish my goals.	SD	D	N	A	SA
I often get angry at the way people treat me	SD	D	N	A	SA
I waste a lot of time before settling down to work.	SD	D	N	A	SA
I don’t feel like I’m driven to get ahead.	SD	D	N	A	SA
I strive for excellence in everything I do.	SD	D	N	A	SA
I have trouble making myself do what I should.	SD	D	N	A	SA
I often get into arguments.	SD	D	N	A	SA
Once I start a project, I almost always finish it.	SD	D	N	A	SA

 **End of Survey - Thank you for your participation** 