



Disentangling development of sensation seeking, risky peer affiliation, and binge drinking in adolescent sport



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HIGHLIGHTS

- Early levels of sensation seeking were related to early levels of binge drinking.
- Early levels of risky peers were related to early levels of binge drinking.
- Early high levels of sensation seeking predicted change in risky peers.
- Early high levels of sensation seeking predicted change in binge drinking.
- Change in binge drinking changed in tandem with change in risky peers.

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1. Introduction

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, 2011; 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, DePadilla, Thompson, Kushner, & Windle, 2010). Illustratively, using latent growth curve analysis, Wichstrom and 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, >80% of published longitudinal studies reported a significant link between youth sport participation and higher alcohol use (Kwan, Bobko, Faulkner, Donnelly, & Cairney, 2014). This mounting evidence makes clear that supervised, organized 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 on 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, Shete, Spitz, & Swann, 2011; Hittner, & Swickert, 2006). Adolescents high on sensation seeking 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

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predictors of adolescent alcohol use and binge drinking (Donohew et al., 1999; Quinn et al., 2011). This desire to seek out novel and exciting experiences also characterizes adolescents who engage in organized sports (Gomà-i-Freixanet, Martha, & Muro, 2012; Zuckerman and American Psychological Association, 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 being high on sensation seeking, and this 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, Ellickson, and McCaffery (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 characterized by a higher proportion of friends who drink than are many other contexts (Barber, Stone, Hunt and Eccles, 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., 2013; 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) co-occurred 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.

2. Methods

2.1. 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 ($M_{age} = 12.99$, $SD_{age} = 0.33$, $Range_{age} = 12–14$ years) and continued for the next two years (approximately 37% of the total sample).

2.2. Procedure

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

2.3. Measures

Scale reliabilities, descriptive statistics, and proportion of sample binge drinking at least once in the previous year, are presented in Table 1.

2.3.1. 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’. To test validity in our sample, correlations were run with impulsivity, a construct known to be related to sensation seeking (Zuckerman, 1994). This scale was positively associated with impulsivity $r(490) = 0.522$, $p < 0.001$.

2.3.2. 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) and to test validity in our sample, correlations were run with illegal drug use, a construct known to be related to binge drinking (Kuntsche, Rehm, & Gmel, 2004). The measure was positively associated with illegal drug use $r(490) = 0.442$, $p < 0.001$.

Table 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 | 0.70 | 0.81 | 0.79 |
| Mean (scaled score) | 3.35 | 3.14 | 3.23 |
| Standard deviation | 1.52 | 0.96 | 0.92 |
| Risky peers | | | |
| Cronbach alpha | 0.66 | 0.78 | 0.77 |
| Mean (scaled score) | 1.19 | 1.46 | 1.82 |
| Standard deviation | 0.37 | 0.69 | 0.83 |
| Binge drinking (1 item) | | | |
| Mean | 1.09 | 1.38 | 1.83 |
| Standard deviation | 0.42 | 0.98 | 1.52 |
| % Binge drinking | 6% | 17% | 31% |

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