

Adolescent sport participation and alcohol use: The importance of sport organization and the wider social context

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Abstract

This paper investigates the relationship between adolescent sport participation and alcohol use, focusing on differences in sport contexts. We also include the wider social context, the role of peers and parents as key variables in our analysis. Our sample consists of a nationally representative sample of 10,992 Icelandic adolescents. The findings indicate that adolescents that participate in formally organized sport clubs are less likely to use alcohol than those that do not. The results obtained for participation in informal sport are in the reverse direction, indicating that adolescents that do only informal sport are more likely to use alcohol than those that do not. Moreover, it was found that the well-known relationship between adolescent alcohol use and having alcohol-using friends was contingent on formal sport participation. We also find that the influence of low parental monitoring and time spent with parents and broken family structure on alcohol use becomes significantly weaker with greater involvement in formal sport. In other words, sport participation in formal sport is more relevant for those groups of adolescents that are at most risk for using alcohol, since it buffers the effects of known risk factors on alcohol use. Participation in informal sport does not, however, show such buffering effects. The findings further highlight the need to consider the wider social context as well as differences in sport organization and sport contexts while studying the potential effects of sports on adolescent alcohol use.

Keywords

Adolescents' alcohol use, sport participation, formal and informal sport, parental influences, peer culture, positive development, social context

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Introduction

It is widely assumed that sport participation among children and adolescents contributes to positive educational and developmental outcomes. Research on this topic, however, shows mixed results (Hartmann and Kwauk, 2011; Jones et al., 2011; Theokas, 2009). One reason for these ambiguities in findings is that the sport includes various heterogeneous sport activities that are organized in different social contexts (Doty, 2006). Classifying them together under one heading is misleading.

Firstly, sport subcultures may vary from one specialty to another, even within the same country. As the definition of sport broadened to include more and more specialties the diversity within sport increased (Claeys, 1985).

Secondly, the formal organization of sport, as well as the mechanisms of recruitment into sport, differs from country to country. The values characterizing the practice of sport and its relation to society at large may vary considerably across cultures. It is important to point out that much of the research on youth sport and delinquent behaviour has been carried out in North America, where the school-based organization of youth sport is completely different from community-focused parent-guided club system in many European countries. One must therefore be careful in generalizing results obtained in North America to other countries. At the same time, cross-cultural research comparing North American results to results obtained in other countries might improve our understanding of the contribution of youth sport to developmental outcomes.

Thirdly, factors outside sport such as the general cultural attitudes and values, peer culture, school- and family-related factors may interfere with developmental outcomes of youth sport participation. The contribution of sport to developmental outcomes cannot be considered in isolation from the rest of society. It is therefore necessary to take the wider social context into account (McCormack and Chalip, 1988). Many of the outcome variables used in sport research are influenced by factors that lie outside sport. Research indicates that even the use of steroids – most often constructed as sport-specific drug – is in part influenced by general risk factors that lie outside sport (Thorlindsson and Halldorsson, 2010).

The variety of sport settings and the social complexities introduced by social factors outside sport suggest that it is critical to take the diversity in sport settings into account in a systematic way. There is nothing in sport by itself regardless of all its diversity that supports the view that sport participation contributes unconditionally to positive developmental outcomes. There is, to the contrary, emerging evidence that the developmental outcomes related to sport participation are contingent on several factors related to sport organization and the social and cultural context that it takes place in (Coakley, 2011; Doty, 2006; Thorlindsson, 1989). Sport sociologists have therefore suggested that it is important to distinguish between categories of sport and physical exercise in order to understand the influence of sport on children and adolescents (Claeys, 1985; Coakley, 2011; Fraser-Thomas et al., 2005; Thorlindsson, 1989; Thorlindsson and Halldorsson, 2010).

One of the outcome variables studied in relation to adolescents and youth participation in sport that has received a lot of attention is alcohol consumption. The use of alcohol has been shown to be detrimental for physical fitness and work against sport

achievement (Reiken, 1991; Suter and Shutz, 2008; Vella and Cameron-Smith, 2010). It is widely accepted that alcohol and sport not mix well. Despite that, the literature on the relationship between sport and the use of alcohol suggests that involvement in sports may actually increase alcohol use (Darling et al., 2005; Fauth et al., 2007; Lisha and Sussman, 2010; Lorente et al., 2004; Mays et al., 2010; Mays and Thompson, 2009; Moore and Werch, 2005). This has been noted in research on American college students (Martens et al., 2006). Research on high school students are more mixed. Some studies show a negative relationship between sport participation and alcohol use (Buhrmann, 1977; Hastad et al., 1984; Hellandsjø Bu et al., 2002; Snyder and Spreitzer, 1983; Thorlindsson et al., 2007; Thorlindsson and Vilhjalmsón, 1991), whereas others show positive or no relationship at all (Davies and Foxall, 2011; Kloep et al., 2001; Lorente et al., 2004; Mays et al., 2010; Mays and Thompson, 2009). Interestingly, researchers outside sport sociology have done much of the research on the relationship between alcohol and sport (Coakley, 2011). Consequently, they have not paid much attention to the diversity of sport setting and the importance of specific sport variables. Most studies on the relationship between sports and the use of alcohol, have, in fact, failed to recognize the different contexts of adolescents' sport participation.

The relationship between adolescent sport participation and alcohol consumption is complicated by the fact that there are factors outside sport that influence alcohol consumption. Peer relations and factors related to family structure and parent-child relationships have received particular attention in this respect. Research consistently shows that peer drinking increases adolescents' alcohol use (Cruz et al., 2012; Fujimoto and Valente, 2012; Overbeek et al., 2010; Vest and Simpkins, 2013). Research also indicates that family-related variables, such as parental monitoring, time spent with parents and family structure, influence adolescent drinking (Barnes and Farrell, 1992; Dishion and McMahon, 1998; Flannery et al., 1999; Thorlindsson et al., 2007; Warr, 1993).

In this study we use a nationally representative sample of 10,992 adolescents to analyse the relationship between adolescents' sport participation and alcohol use. The study enhances the research in this area in several ways: (1) we take difference in sport contexts into account, arguing that it is critical to distinguish between formal and informal sport in countries where the sport club system is the dominating form of youth sport organization (Thorlindsson and Halldorsson, 2010); (2) we take variables outside sport that may influence the relationship between sport and alcohol consumption into account, paying particular attention to the role of peers and parents as a key variables in adolescent alcohol consumption; (3) we look at interactions as well as linear relationships; (4) we analyse and compare the pattern for males and females separately; (5) we use three different measures of adolescents' alcohol consumption; (6) we add cross-cultural findings to the predominately North American literature on this topic.

The organization of youth sport and patterns of sport participation

The starting point of our research is the viewpoint that the social organization of sport, the context in which sport activities take place and the definition of sport participation

are crucial in understanding the relationship between youth sport and alcohol use. We argue that using the same definition of sport for all sport activities despite the different organization, social contexts and goals of different forms of sport is misleading. There exist many different ways of organizing youth sports. Thus, the Scandinavian system based on sport clubs organized at the local community level is very different from the American school-based system. Research tends to reflect this difference. Research from Scandinavia on the relationship between sport participation and adolescent substance use tends to show that participation in formal sport is negatively associated with alcohol use (Hellandsjø Bu et al., 2002; Kloep et al., 2001; Thorlindsson and Vilhjalmsson, 1991), which is in contrast with many American studies that show substantially higher substance use among adolescents than in Scandinavia (DuRant et al., 1993; Miller et al., 2005) and a positive relationship between sport and adolescent substance use (Mays et al., 2010; Moore and Werch, 2005).

The organization of youth sport in Iceland follows the Scandinavian model in the sense that youth sports take place in formally organized sport clubs that are nested in the local communities all over the country. The sport clubs emerged in the beginning of the 20th century and were in part rooted in the voluntary movements that were influential in Iceland. They were intended to help to build up communities and provide children and adolescents with an opportunity to have fun and develop their skills. Hellandsjø Bu et al. (2002) have noted the social control aspects of formal sport where there are strict rules that forbid alcohol use in the sport clubs, sport tournaments and in sport-related trips. The use of alcohol is clearly not accepted. This is further a part of coaches' code of youth sport ethics. The sport clubs emphasize competitive sport and promote systematic training and fixed curriculum. They are coached by educated coaches and laymen, and run or supported by parents and the local community at large. About 60% of the population of adolescents in Iceland participate in sport with the clubs once a week or more, whereas around 40% practices four or more times a week (Rannsóknir og greining, 2012).

With increased opportunities to participate in sports, and ongoing expanding diversity of sports in the 20th and 21st centuries, different forms of sport and different sport cultures have gained strength. Today the traditional sport model where sports were exercised within formal sport clubs with competition in mind is now only one form of adolescent sport. Other forms, such as recreational sports, fitness and extreme sports have become popular and are a part of the lives of large groups of adolescents in modern society. These new forms differ in many ways from traditional sport, exercised in formal sport clubs. Such sport participation tends to be less organized and less adult controlled. It is not as well established as sports in formally organized sport clubs. It is less concerned with formally organized tournaments and more individually initiated and spontaneous. These sport activities take place in gyms, fitness centres, sky parks and open spaces. There the focus can be on diverse issues such as physical fitness, to enhance skills, have fun and showing off rather than formal training and competition in organized tournaments.

Both types of sport participation are defined and considered as sports. They are, however, based on different forms of youth sport organization. They represent different sport categories and they are rooted in different social and cultural context. In order to

untangle the complex relationship between sport participation and alcohol use, it is important to examine these different types of sport context separately.

Following Hellandsjø Bu et al. (2002) Kloep et al. (2001) and Thorlindsson and Vilhjalmsón (1991), we would predict that participation in formal sport should be negatively correlated with the use of alcohol. Secondly, we would also predict that participation in formal sport should reduce alcohol use more than informal sport.

Furthermore, we need to address what level of adolescent participation in sport counts as active sport participation. It can be misleading to categorize those who show up once or twice a week with those who practice every day as one group of sport participants. It seems reasonable to expect those who practice less than once a week to have lower commitment to sport than those who practice four times a week or more. Sport participants that take part in most or all practice sessions, tournaments and sport-related social gatherings should be more influenced by sport than those who train less than once a week. If the social contexts of sports influence participants in some ways, then these influences should be more evident in the group of participants that do sport four times a week or more (Thorlindsson and Halldorsson, 2010). We would predict that those who participate in sport four times a week or more are less likely to use alcohol than those who practice less.

Sport and alcohol in the wider social context

Prior research indicates that factors related to family influence adolescent alcohol consumption (Barnes and Farrell, 1992; Bjarnason et al., 2003; Dishion and McMahon, 1998; Steinberg et al., 1994; Thorlindsson et al., 2007; Warr, 1993; Wright and Cullen, 2001). Thus, family interaction predicts adolescent alcohol use. Social control theory predicts that parental monitoring is negatively related to adolescent delinquency (Hirschi, 1969; Wright and Cullen, 2001). Children and adolescents that are closely monitored by their parents are less likely to drink alcohol than those that are not (Barnes and Farrell, 1992; Dishion and McMahon, 1998; Steinberg et al., 1994; Thorlindsson et al., 2007). Research also shows that adolescents that spend more time with parents are less likely than adolescents that spend less time with parents to drink alcohol (Thorlindsson et al., 2007; Warr, 1993). Finally, research indicates that adolescents from single parent households are more likely to drink alcohol than adolescents living with both parents (Bjarnason et al., 2003; Thorlindsson et al., 2007). It is important to take these family factors into account in research on the relationship between sport participation and alcohol use. If participation in organized sport reduces adolescent drinking, the relationship of the family variables should vary across levels of participation in organized sport. We would expect participation in organized sport to reduce the risk proposed by low levels of monitoring, less time spent with parents and growing up in single parent households. In other words we would predict that the relationship between low monitoring and alcohol use should be weaker for those adolescents that participate in organized sport. In a similar way we would predict that the relationship between little time with parents and alcohol use would be weaker between adolescents that participate in organized sport. Finally, we would predict that the relationship between growing up in a single-parent household and alcohol use should be weaker for

those adolescents that participate in organized sport. We would however not expect participation in informal sport to have the same effect.

The peer group is central in the adolescents' life-world. Peer influence is visible in all aspects of adolescent society. Keeping in mind that adolescents spend more time with their peers than they do with parents (Csikszentmihalyi and Larson, 1984; Savin-Williams and Berent, 1990), it does not come as a surprise that association with alcohol-drinking peers tends to be one of the strongest predictors of alcohol use among adolescents (Cruz et al., 2012; Fujimoto and Valente, 2012; Overbeek et al., 2010; Thorlindsson and Bernburg, 2006; Vest and Simpkins, 2013). Having friends that drink alcohol increases the likelihood of similar behaviours among adolescents (Kristjansson et al., 2008; Thorlindsson et al., 1998). In contrast, very few of the adolescents who report having almost no friends who drink alcohol have drunk themselves. These findings are consistent with an important strand of research on deviant behaviour that has been conducted in numerous countries (Nash et al., 2005; Palmqvist and Santavirta, 2006; Sutherland and Cressey, 1978). Taking these findings into account, we would argue that the relationship between peer drinking and alcohol use should vary across levels of participation in organized sport. We would therefore predict that the relationship between peer drinking and alcohol use should be weaker for adolescents that participate in formal sport. Again we would not expect these results to hold for informal sport.

Methods

Participants and procedures

The data for this study came from the latest of the population-based Youth in Iceland surveys. The sample includes 8th, 9th and 10th grade students, aged 13–16 years, who were enrolled in all Icelandic secondary schools during February 2012. The respondents represent around 85% of the national population of Iceland in this age group. All aspects of data collection were supervised by the Icelandic Centre for Social Research and Analysis (ICSRA) at Reykjavik University, and carried out with passive parental consent using procedures approved by the Icelandic authority overseeing the protection of human research subjects. ICSRA distributed anonymous questionnaires and envelopes for returning completed questionnaires to all secondary schools in Iceland. Consistent with published study protocols (Kristjansson et al., in press; Sigfusdottir et al., 2009), teachers at individual school sites supervised the participation of the students in the study and administered the survey questionnaire. All students who attended school on the day that the questionnaire was scheduled to be administered completed the questionnaire. Students were instructed not to write their names, social security numbers or any other identifying information anywhere on the questionnaire. When finished the students were asked to place their completed questionnaire in the sealed envelope provided before returning it to the supervising teacher. A total of 10,992 students in 8th, 9th and 10th grade (50.2% girls) completed the questionnaire.

Approximately 90% of the estimated 320,000 inhabitants of Iceland are of Norse-Celtic decent, with about 76% of the population belonging to the Lutheran State Church and no other religious institution having more than 3.4% of the population registered in

its services (Statistics Iceland, 2013). Because of this homogeneity, exogenous variables such as race and religion, which are often used in research in other countries, were not included in the present analysis.

Measures

Alcohol use was measured with three variables: how often have you used alcohol; how have you become drunk; and how often have you become drunk in the last 30 days. All variables were measured on a seven-item scale, from never to 40 times or more. The variables were coded as never = 0 and used = 1.

Participation in formal sport (in a sport club) was measured on a six-item scale from never to almost every day. Participation in informal sport (sport or fitness) was measured on an identical six-item scale, ranging from never to almost every day. Since sport participants could take part in both formal and informal sport, we excluded all subjects that participated in formal sport from the informal sport variable ($N = 6457$). The measures of formal and informal sport participation are therefore mutually exclusive. Both variables were recoded in three different ways. Sport 1 variable included those who participate less than once a week = 0, 1–3 times a week = 1, and 4 times a week or more = 2; sport 2 variable included those who participate less than once a week = 0, and once or more a week = 1; sport 3 variable included those who participate less than once a week = 0, and those who participate 4 times or more a week = 1.

Friends' alcohol use was measured with two variables. How many of their friends drink alcohol and how many of their friends get drunk at least once a month. Both variables were measured on a five-item scale from none to almost all and were coded separately as none = 0 and some = 1; and none = 0, some = 1 and most = 2.

Family structure was coded as live with both parents = 0, other arrangement = 1. Time spent with parents was a computed measure from the following two variables: I spend time with my parents on weekdays (outside school); and I spend time with my parents on weekends ($\alpha = 0.75$). Both variables were measured on a four-item scale from almost never to nearly always. The computed variable was recoded as seldom = 1, sometimes = 2, and often = 3. Parental monitoring was a computed measure from the two following variables: My parents monitor whom I'm with at nights; and My parents monitor where I am at nights ($\alpha = 0.86$). Both variables were measured on a four-item scale from applies well to applies poorly. The computed variable was coded as high monitoring = 1, medium monitoring = 2 and low monitoring = 3.

Sex was coded as males = 0 and females = 1 and age was measured on a three-item scale as 8th grade = 1, 9th grade = 2 and 10th grade = 3.

Analysis

We used logistic regression where the coefficients reported are odds ratios to analyse the relationship between the variables and alcohol use. The odds ratio is the multiplicative effect of a one-unit change in the independent variable on the odds of the dependent variable. We further used the intercepts and the sum of slopes from the ordinary least squares (OLS) regression analysis to test the contingent effects of variables such as friends'

alcohol use, parental monitoring, time with parents and family structure, and different forms of sport participation on alcohol use. Results are presented as predicted values of alcohol use. The significant measures show if the interactions of the independent variables on the dependent variable (alcohol use) are significant. *R*-correlation was used to test general correlation and *t*-tests were used to test for general statistical significance.

Findings

Table 1 shows that over one third (36.1%) of Icelandic adolescents have used alcohol, around 12% have been drunk and almost 4% have been drunk in the last 30 days. Some gender differences are noted where boys are more likely than girls to use alcohol. A significant difference was found between boys and girls for variables *a* ($t = 2.692, df = 1451, p = 0.007$) and *c* ($t = 2.692, df = 1451, p = 0.007$). Alcohol use increases with age, where the oldest group is three times more likely to have been drunk ($t = 11.035, df = 7024, p = 0.000$) and four times more likely to have been drunk in the last 30 days ($t = 11.035, df = 6968, p = 0.000$) than the youngest group.

Table 1 further reveals that adolescents who participate in formal sport are less likely than other adolescents to use alcohol. Thus, 44.6% of those that participate in sport less than once a week have used alcohol. The corresponding number for those that participate in sport 1–3 times a week is 35%. The lowest percentage of 28.7% is obtained for those who participate in formal sport four times a week or more. This drop in alcohol use as participation in formal sport increases is significant ($t = 13.949, df = 10399, p = 0.000$) and fairly strong. The same pattern is obtained between formal sport participation and all variables of alcohol use. The proportion of those that have been drunk drops from 17.6% for those that do sport less than once a week to 6.8% for those that participate in sport four times a week or more. The corresponding numbers for “have been drunk in last 30 days” are 6.1% and 1.9%. Table 1 shows that the relationship between informal sport participation and alcohol use differs from the one obtained for formal sport participation. Almost 48% of those that participate in informal sport four times a week or more have used alcohol, whereas roughly 42% of those that participate less than once a week have used alcohol. Similar results are obtained for other measures of alcohol use. Those who participate in informal sport four times or more often a week are almost twice as likely to have been drunk at one time point or drunk in the last 30 days than the population. The relationship is only significant for variable *a* ($t = -2.669, df = 2036, p = 0.008$).

Table 1 indicates that alcohol use is by far highest among those who have friends that use alcohol. Over 60% of those that have used alcohol have friends that have been drunk ($t = -37.953, df = 10,484, p = 0.000$) and around 30% that have been drunk have friends that have been drunk ($t = -41.887, df = 10,498, p = 0.000$). Also, over 11% that have been drunk in the last 30 days have friends that have been drunk ($t = -24.224, df = 10,417, p = 0.000$). Finally, living with both parents, time spent with parents and being monitored by parents are all variables that are significantly negatively correlated with adolescent alcohol use.

Figure 1 illustrates the relationship between alcohol use and sport participation and shows that alcohol use differs depending on forms of sport participation. The

Table 1. Demographics and selected sport participation variables, peer alcohol use variables and key family variables by alcohol use (percentages and numbers).

	a) Have used alcohol	b) Have been drunk	c) Have been drunk in the last 30 days
All (N = 10,992)	36.1 (3801)	11.7 (1231)	3.9 (409)
Boys	39.5 (2045)	12.1 (625)	4.3 (219)
Girls	32.9 (1756)	11.3 (606)	3.6 (190)
Youngest group (13–14 years)	26.0 (909)	5.1 (177)	1.5 (51)
Middle group (14–15 years)	34.7 (1221)	8.8 (310)	2.8 (98)
Oldest group (15–16 years)	47.5 (1677)	21.0 (741)	7.4 (260)
Sport participation			
Formal sport (N = 6601)			
Less than once a week	44.6 (1718)	17.6 (678)	6.1 (233)
1–3 times a week	35.4 (843)	10.2 (244)	3.5 (83)
4 times a week or more	28.7 (1196)	6.8 (283)	1.9 (79)
Informal sport (N = 2810)			
Less than once a week	41.9 (479)	16.6 (190)	6.0 (68)
1–3 times a week	44.3 (834)	16.9 (319)	5.7 (106)
4 times a week or more	47.8 (428)	20.6 (185)	7.5 (67)
No sport (N = 1104)	42.1 (470)	16.5 (184)	5.8 (64)
Peer alcohol use			
Friends have used alcohol	57.4 (2608)	24.0 (1093)	8.3 (375)
Friends have been drunk	62.1 (1902)	30.9 (951)	11.4 (345)
Parents and family			
Family structure			
Live with both parents	32.3 (2367)	8.7 (638)	3.0 (221)
Other arrangement	44.8 (1462)	18.5 (607)	6.1 (197)
Time with parents			
Seldom	45.1 (1765)	18.7 (732)	6.8 (264)
Sometimes	33.4 (1309)	8.4 (328)	2.5 (96)
Often	26.6 (697)	6.3 (165)	1.8 (48)
Parental monitoring			
Low	46.7 (1501)	17.2 (556)	6.3 (201)
Medium	35.7 (1444)	10.8 (436)	3.6 (143)
High	26.2 (828)	7.1 (225)	1.9 (60)

relationship is significant where participation in formal sport in sport clubs is associated with lower use of alcohol. There is a negative linear correlation between the frequency of formal sport participation and the use of alcohol ($r = -.147^{**}$). There is, however, a positive linear relationship between the frequency of informal sport participation and alcohol use, where increased participation is associated with higher use of alcohol ($r = .036^*$).

Table 2 shows the results of the logistic regression with different measures of alcohol use as the dependent variables adjusted for gender and age. The table shows the odds

Significance: * $p < .05$; ** $p < .01$.

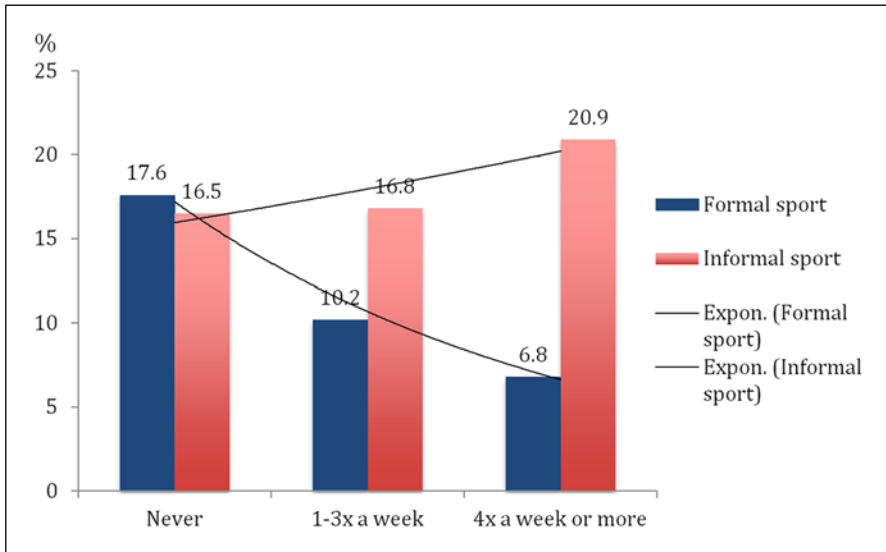


Figure 1. Percentage of students that have been drunk by sport participation in formal and informal sport.

ratios and the 95% confidence interval for different sport participation variables and friends' alcohol use.

The results reveal that those who participate in formal sport are significantly less likely to use alcohol than those that do not participate in sport. Also, the more often they practice, the less likely they are to use alcohol. Table 2 indicates that those that participate in informal sport once a week or more are more likely to have used alcohol than those who do not participate in sport at all. The differences between those that participate in informal sport and those that do not participate in any sport, however, are only significant for variable 1. The relationship does not hold for those who have been drunk or if they have been drunk in the last 30 days. The results from Table 2 further reveal that those who have friends that use alcohol or have been drunk are much more likely to use alcohol than those who do not have friends that use alcohol. Those who have friends that use alcohol are almost 11 times more likely to have been drunk in the last 30 days than those that have not been drunk in the last 30 days.

The contingent effects of peer behaviour and different forms of sport participation on alcohol use are shown in Figures 2 and 3. They are presented as predicted values of alcohol use by measures of how often the participants practice sports and how many of their friends use alcohol, controlled for gender and age. Figure 2 shows this interaction (relationship) for formal sport and Figure 3 for informal sport.

Figures 2 and 3 show statistical interaction between peer behaviour and different forms of sport participation on alcohol use. Those adolescents who have been drunk have friends who have used alcohol, in all categories of formal sport participation (Figure 2).

Table 2. Odds ratios for alcohol use, controlled for gender and age.

	Have used alcohol	(95% CI)	Have been drunk	(95% CI)	Have been drunk in the last 30 days	(95% CI)
Formal sport						
Variable 1 (less than once a week, once or more)	.716***	.683	.751	.468***	.412	.531
Variable 2 (less than once a week, 1–3 times, 4 times or more)	.590***	.542	.642	.618***	.574	.666
Variable 3 (less than once a week, 4 times or more)	.516***	.469	.567	.380***	.327	.442
Informal sport						
Variable 1 (less than once a week, once or more)	1.080*	.986	1.182	1.016	.841	1.229
Variable 2 (less than once a week, 1–3 times, 4 times or more)	1.110	.960	1.282	1.071	.952	1.205
Variable 3 (less than once a week, 4 times or more)	1.152	.958	1.385	1.162	.920	1.468
Friends						
Friends have used alcohol (none, some, most)	4.664***	4.291	5.070	9.262***	8.101	10.590
Friends have been drunk in the last 30 days (none, some, most)	3.987***	3.649	4.357	7.992***	7.037	9.075
Parents						
Family type (live with both parents, other arrangement)	1.765***	1.617	1.926	2.537***	2.238	2.874
Time with parents (seldom, sometimes, often)	.663***	.656	.732	.539***	.493	.589
Parents monitoring (high, medium, low)	1.568***	1.617	1.926	1.761***	1.614	1.920

* Significant at the $p < 0.10$ level.** Significant at the $p < 0.05$ level.*** Significant at the $p < 0.01$ level.

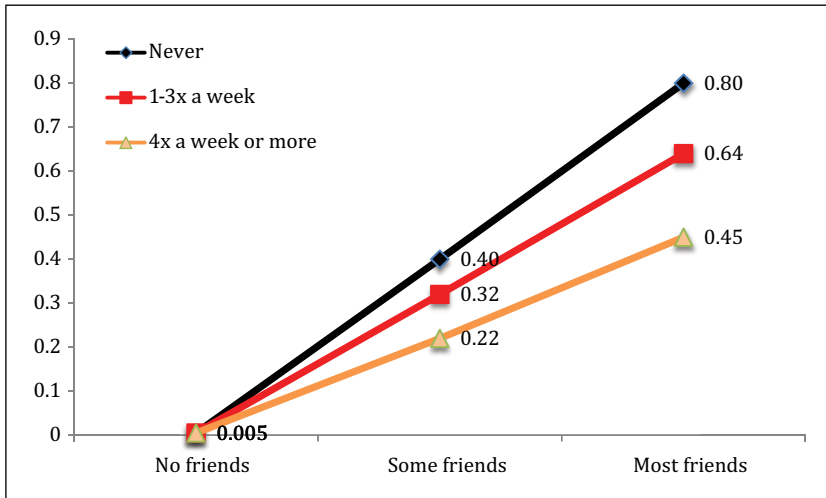


Figure 2. Students that have been drunk by interaction of formal sport participation and how many of their friends have used alcohol (controlled for gender and age).

*The interaction is significant at the $p < 0.01$ level.

The relationship is strongest among those that never participate in formal sport and weakest in the group that participates in formal sport four times or more a week. Despite having most or all friends that have been drunk, those who participate four times or more a week in formal sport are less likely to have been drunk than those who participate less or never in formal sport ($p < 0.05$). These findings suggest that participation in formal sport reduces the likelihood of alcohol use among participants, even though most or all of their friends use alcohol. Participation in formal sport hence seems to have preventive value for alcohol use. This is not the case for participation in informal sport, where there is no such decrease in alcohol use by those who participate in informal sport whether they have friends who use alcohol or not (Figure 3).

The interaction effects for parental monitoring and alcohol use across different forms of sport participation are shown in Figure 4 for formal sport and Figure 5 for informal sport. We see that the predicted value for the likelihood to have been drunk are lower for those who participate in formal sport, despite low monitoring from parents, than for those who do not practice formal sport (Figure 4).

This relationship is complex, where a different pattern emerges for informal sport than for formal sport. For informal sport (Figure 5) we see that those who have high parental monitoring and participate in informal sport are less likely than those who do not practice sport to have been drunk. However, the relationship changes depending on level of parental monitoring, with those adolescents that have low parental monitoring and participate in informal sport being more likely to have been drunk than those who have low parental monitoring and do not participate in any sport. These findings suggest a lack of preventive effects of participation in informal sports for those adolescents that are monitored less by parents.

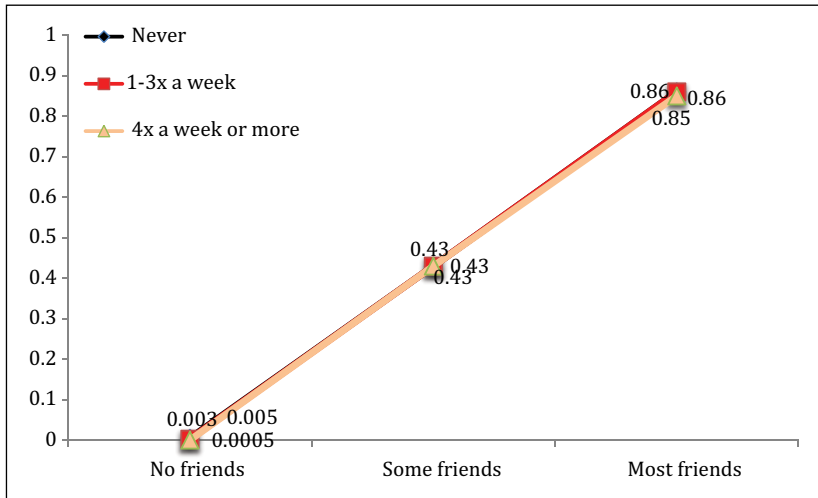


Figure 3. Students that have been drunk by interaction of informal sport participation and how many of their friends have used alcohol (controlled for gender and age). The interaction is not significant.

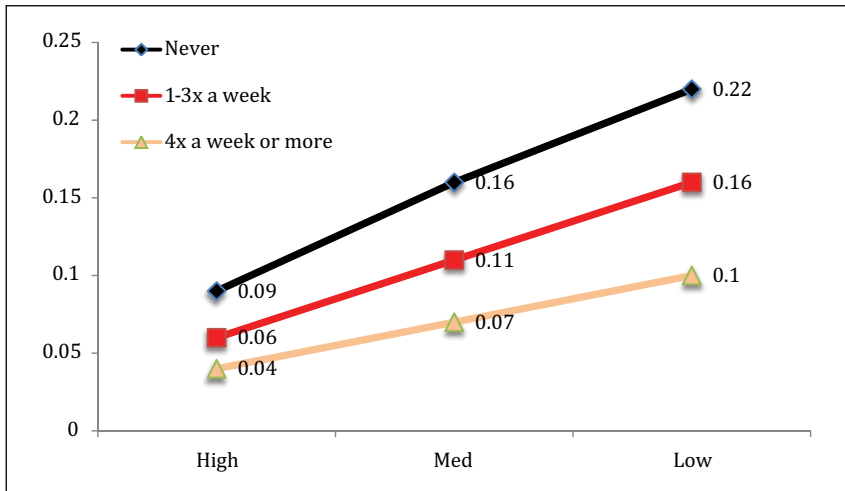


Figure 4. Students that have been drunk by interaction of formal sport participation and parental monitoring (controlled for gender and age). *The interaction is significant at the $p < 0.01$ level.

We see the same trend for the contingent effects of time with parents (Figure 6) and family structure (Figure 7) and formal sport participation and alcohol use. Increased participation in formal sport is associated with lower use of alcohol on both measures.

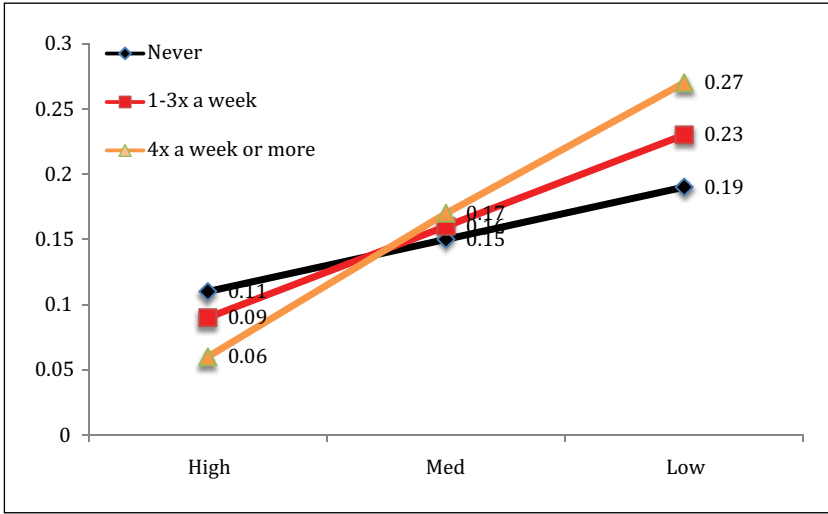


Figure 5. Students that have been drunk by interaction of informal sport participation and parental monitoring (controlled for gender and age).
 ***The interaction is significant at the $p < 0.01$ level.

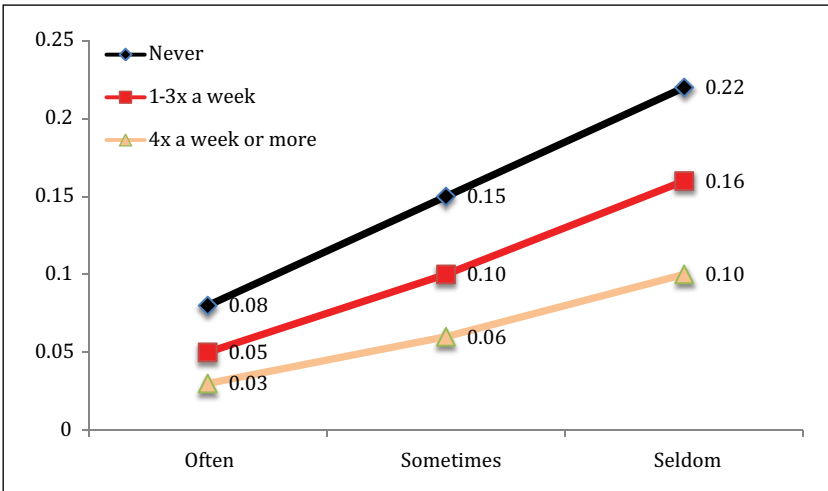


Figure 6. Students that have been drunk by interaction of formal sport participation and time with parents (controlled for gender and age).
 *The interaction is significant at the $p < 0.01$ level.

The interactions of informal sport and time with parents and family structure and alcohol use were not significant.

Finally, we also analysed the contingent effects of peer behaviour, parental monitoring and different forms of sport participation on alcohol use for gender. The results for

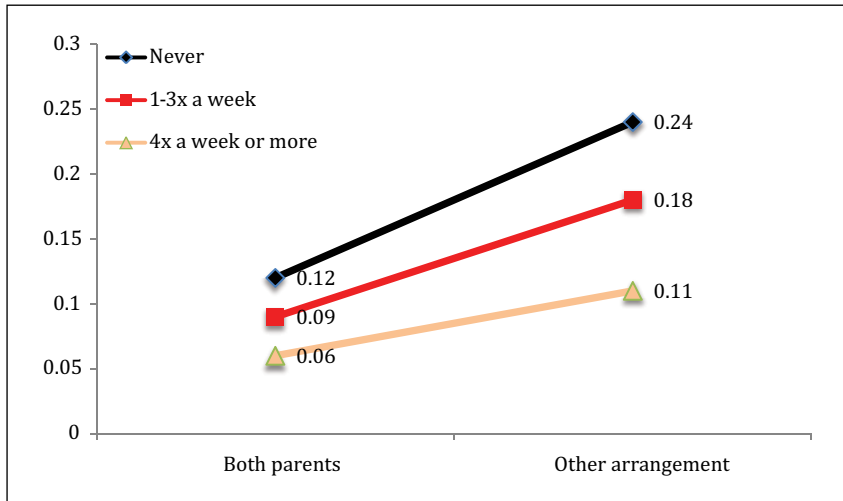


Figure 7. Students that have been drunk by interaction of formal sport participation and family structure (controlled for gender and age).
 *The interaction is significant at the $p < 0.01$ level.

both peer behaviour and parental monitoring follow the same pattern, although the predicted values are higher for males than for females.

Conclusion

The findings above show that the relationship between alcohol use and sport participation is complex. It varies across sport contexts. It is intertwined with peer and parental influences on adolescent alcohol use. We find that there is a negative relationship between participation in formal sport and the use of alcohol. These findings are consistent across all social categories of the study. They are also consistent across all three measures of alcohol use. They also hold when important factors related to alcohol use are controlled for. In contrast, the relationship between informal sport and alcohol is positive. Thus, the findings above indicate that the influence of alcohol-using friends on alcohol use varies across levels of participation in formal sport. The more often that adolescents take part in formally organized sport, the less likely they are to drink alcohol even if they have friends that drink alcohol. Formal sport tends to buffer the influence of alcohol-using friends on adolescent alcohol use. A reverse pattern is obtained for participation in informal sport. It tends to intensify the influences of alcohol-using friends on adolescent alcohol use. Again, the difference in the relationships of these two forms of sport organization to alcohol use is striking. Similar patterns are observed for the family-related variables. The influence of low parental monitoring and time spent with parents on alcohol use becomes significantly weaker with greater involvement in formal sport. The influence of “not living with both parents” on alcohol use becomes weaker with participation in formal sport. In other words, these findings indicate that

participation in formal sport can buffer the influence of peer- and family-related risk factors on adolescent alcohol use. Sport participation in formal sport has more influence on those groups of adolescents that are at most risk for using alcohol due to social factors that lie outside sport. Formal sport seems therefore, in some cases, to reduce the influence of social factors that increase alcohol use among adolescents. No such results are, however, observed for adolescents that do only informal sport.

These findings highlight the fact that different sport contexts must be taken into account in research on sport and alcohol use. Thus, the findings lend support to sport sociologists that argue that it is important to differentiate between heterogeneous sport activities that are organized in different social contexts (Claeys, 1985; Coakley, 2011; Fraser-Thomas et al., 2005; Thorlindsson, 1989; Thorlindsson and Halldorsson, 2010). Lumping them together under one heading in order to understand the influence of sport on adolescent alcohol use may be highly misleading. The influence of sport in this regard depends on the way it is organized. Variations in social organization, different structures, goals and contexts of sport participation may lead to different outcomes (Coakley, 2011; Thorlindsson, 1989).

One major shortcoming of this study is that it does not explain what it is in the social organization of formal sport that differentiates it from informal sport. Some researchers have suggested that formally organized sport employs more social control in relation to youth sport (Hellandsjø Bu et al., 2002; Thorlindsson and Halldorsson, 2010). Several scholars have pointed out that because alcohol is detrimental for physical fitness it works against sport achievement (Reiken, 1991; Suter and Shutz, 2008; Vella and Cameron-Smith, 2010). Coaches and parents may advance this view and even try to enforce it. It is, however, unclear to what extent the adolescents themselves are aware of the connection of alcohol to sport achievement. More research is needed on the proposed mechanisms of social control in this context. Sociologists have also suggested that values may be important. Shields and Bredemeier (1995) argue that the sport context symbolizes cultural values, which are taught to participants. Different contexts and sport forms emphasize different values and establish different norms. Future research might explore this line of thought further by defining and measuring the values involved directly.

Zambon et al. (2010) indicate that adolescent participation in clubs, including sport clubs, increases social capital that enhances their wellbeing. However, belonging to a club, with the exception of religious clubs, tended to increase the likelihood of the adolescents having been drunk. Zambon et al. (2010) point out that it seems that social interaction among peers tends to increase alcohol use unless there are strong social norms against it. More research along these lines of thought is needed.

In short, more research is needed on the relevant social processes and mechanisms that explain the relationship between adolescent sport participation and alcohol use. Future research in this area should also address the relationship of different sport disciplines to alcohol use.

This study adds some cross-cultural material to an area of sport inquiry that has been dominated by North American research. The findings suggest that the difference in sport organization from country to country may be of importance to our understanding of the contribution of sport participation to alcohol use. Our finding that informal sport participation is positively correlated with alcohol use is in line with previous North American

studies conducted among high school and collegiate athletes (e.g. Lisha and Sussman, 2010). The negative correlation between formally organized club sports and adolescents' alcohol use, as well as on the buffering effect of such sport participation on alcohol use, suggests that there is something in the organization of the formal sport club system that accounts for the negative relationship between sport participation and alcohol use. It is also possible that the organization of sport that focuses on student athletes may bring them a gain in status among their school peers and thus place them in a specific reference group within the school setting that boosts their party lifestyle (Eccles et al., 2003; Mitchell and Willower, 1992). In the Scandinavian system children and youth sports are less visible to the public and peers, and the sport clubs are largely independent from the schools' social context. Considering these and other possible international differences in the structure of sport, one must be careful when attempting to generalize findings from one national context to another. At the same time, cross-cultural research provides ample opportunities to further our understanding on the influence of sport on children and adolescents. Sport is organized and practised in different social contexts. Social structures, national and local cultures consisting of different values, may influence sport-related outcomes making the issues involved even more complex. Cross-cultural research could play an important role in untangling the theoretical and empirical issues involved.

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