



## Preserve Ross Valley

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Anne Petersen  
Kentfield Planning Advisory Board  
P.O. Box 304  
Kentfield, CA 94914

January 27, 2016

**Re: Marin Catholic High School's Application for Football Stadium Lighting**

Dear Ms. Petersen:

This follows up on the following argument that I expect some MC lights proposal supporters will make: they will contend that the Friday Night Lights will reduce drug and alcohol consumption by Marin County teenagers. I have heard that assertion several times by the supporters, but they have never provided any empirical data to back up that emotional claim, and I have not found any.

In fact, it is just as reasonable to assume that Friday Night football games will lead to more alcohol and drug consumption by Marin County teens, as opposed to less. The enclosed 2011 National Institutes of Health article certainly supports the inference that Friday night events (including football games) lead to "pre-gaming" alcohol abuse by teens, not to a reduction in their drug and alcohol abuse.

Thank you for considering this point.

A handwritten signature in black ink that reads "Brendan J. Fogarty". The signature is written in a cursive, flowing style.

Brendan Fogarty  
125 Corte Balboa  
Greenbrae, CA 94904

Encl.



# NIH Public Access

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## Pregaming in High School Students: Relevance to Risky Drinking Practices, Alcohol Cognitions, and the Social Drinking Context

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### Abstract

Pregaming is the practice of consuming alcohol prior to going out to a social event. Although pre-gaming has begun to receive research attention in the college setting, very little is known about this risky drinking behavior in high school students. As pre-gaming has health implications for both students who are college bound and those who are not, we examined the prevalence of this behavior in a sample of high school students who reported current alcohol use and completed pre-gaming measures ( $n = 233$ ). The present study examined the associations of gender, age, alcohol expectancies, motivations for drinking (e.g., social, enhancement, and coping), and engagement in other risky drinking practices (i.e., general hazardous use and drinking game participation) with pre-gaming. Results indicate that pre-gaming was significantly associated with being older, being a male, having high levels of hazardous alcohol use, and participating in drinking games frequently. Pre-gaming also occurred most often before parties and sporting events and it was associated positively with frequency of attendance at parties where alcohol is available, the tendency to use alcohol at these parties, and the amount of alcohol consumed at these parties. We discuss the findings in the context of pre-gaming research that has been conducted with college students, and make suggestions regarding prevention and intervention efforts focused on this risky drinking practice.

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While Straus and Bacon (1953) noted decades ago that heavier drinkers tended to drink before social functions, it is only in the past five years that pregaming has been examined empirically. Pregaming (also called pre-loading, pre-bar, or prepartying) is defined as drinking while waiting for people to gather for a social event, drinking in order to “get buzzed” before going to a party or function where alcohol will be expensive (e.g., at a bar or a club), or drinking prior to entering a social situation where alcohol would be difficult to obtain (e.g., a school function). In this way, pregaming can be distinguished from participating in drinking games (DG), an activity in which alcohol consumption is governed by a series of rules with the common goal of rapid intoxication (see Borsari, 2004). Recent research with college students indicates that pregaming is widespread and is linked to hazardous alcohol use and increased intoxication (e.g., Borsari, Boyle et al., 2007; LaBrie & Pedersen, 2008; Pedersen & LaBrie, 2007; Read, Merrill, & Bytschkow, 2010; Zamboanga, Schwartz, Ham, Borsari, & Van Tyne, 2010). A recent study with college students found that underage drinkers pregame on more days per month than their legal age counterparts; moreover, saving money and being able to drink when underage were among the common reported reasons to do so (Read et al., 2010).

Very little is known about pregaming among high school students. To date, only one study examining pregaming behavior has included current high school students. Mitic (1989) studied alcohol use among adolescents enrolled in junior high or high school in Canada and found that over 50% of the students reported pregaming by the time they reached their senior year of high school. In a related study, Kenney, Hummer, and LaBrie (2010) examined high school pregaming behaviors retrospectively using a sample of college freshmen and found that 45% of the students in their sample reported pregaming in high school. Moreover, their results indicated that current pregamers and those who reported pregaming in high school consumed more alcohol than non-pregamers during the last few months of high school, and reported significantly more current alcohol use and negative consequences than non-pregamers. However, as this study relied on retrospective reports of college students, it is unknown whether the findings generalize to current high school students.

The paucity of research examining this risky drinking behavior among high school students is unfortunate, given that high school represents a critical period for initiation and establishment of drinking patterns known to predict later problematic drinking outcomes (e.g., Hersh & Hussong, 2006; see Zucker, 2008 for a review). Thus, it is not known whether high school pregaming is a similar or different phenomenon than the pregaming practiced by college students. For example, since all high school students are under the legal drinking age, it may not be the case that younger high school students would be more likely to pregame as observed in college student samples (e.g., Read et al., 2010). Alternatively, it could be that older high school students have more independence (and/or perceive that they do) than younger high school students (e.g., being able to drive, less adult supervision, later curfews) and therefore are more likely to pregame.

The present study sought to advance our understanding of pregaming by exploring three primary research questions. First, are gender, age, cognitions about alcohol use (e.g., alcohol expectancies and drinking motives), and engagement in other risky drinking practices (e.g., general hazardous use and drinking game participation) predictive of students' likelihood of pregaming? Second, among students who pregame, are gender, age, cognitions about alcohol use, and other risky drinking practices associated with students' reported frequency of pregaming? Third, what is the most common type of social event for which high school students report pregaming and how might pregaming be related to subsequent alcohol use in this social context?

## Method

### Participants

Participants were drawn from a larger study of adolescent substance use behaviors and attitudes among a sample of high school students ( $N = 594$ ; of the 595 questionnaires administered, 594 were completed as directed) from one public high school in the northeastern United States. For the purpose of this study, we restricted the sample to those students who reported consuming alcohol in the past 30 days and completed pregameing measures ( $n = 233$ ; 51% girls; mean age = 16.1,  $SD = 1.11$ , range = 14–18; 76% White, 2% Asian, 3% Black, 6% Hispanic, 1% American Indian, 12% Mixed/Other). We used the standard past 30-day recall period to help facilitate students' accurate report of their drinking behaviors.

### Procedures

Parents of all students enrolled in a local high school were mailed a letter inviting their child(ren) to participate in this study and a parental consent form. Students were instructed to return their signed consent forms (which provided parents with the option to allow or not allow their child to participate in the study) to their teacher in order to be entered into a drawing to win one of several prizes (even if their parents did not give them permission to participate). The school also received a monetary donation for their assistance with project implementation and classroom teachers were eligible to receive monetary compensation (for classroom supplies/activities) for having high rates of returned signed parental consent forms regardless of the parental decision for or against participation. In addition, the IRB granted the principal investigator a *waiver of written assent*; thus, students verbally assented to participate to help facilitate the veracity of their self-report. Students were told that the information they provided would be anonymous. Approximately 70% of all students in the high school participated in the study. Students who received parental consent to participate completed anonymous surveys during one class period; the survey took approximately 30–45 minutes to complete. Participants placed the completed survey in a “ballot” box then received a written debriefing form. Students who did not receive parental consent to participate worked at their desks during the assessment. The principal investigator's college IRB approved all procedures.

### Measures

Participants provided demographic information and reported on their drinking behaviors as well as their alcohol expectancies and attitudes toward alcohol use.

**Pregameing**—Participants reported how many times in the past month they “pregamed” or “prepartied” using a 6-point scale (1 = *One Time*, 2 = *Two Times*, 3 = *Three Times*, 4 = *Four Times*, 5 = *Five Times*, 6 = *Six Times or More*). In the survey, pregameing was defined as drinking before going out for the night (e.g., at home, in room, or a friend's home/room) which includes drinking while waiting for people to gather for the evening, or drinking in order to “get buzzed” before going to a party/function at which alcohol will be expensive (e.g., at a bar or club) or difficult to obtain (e.g., at a school function). We also created a dichotomous variable among those students who reported pregameing reflecting whether the student pregameed at all or pregameed at least one time in the past month. Finally, students indicated from the following options the social contexts for which they are likely to pregame: night sporting events, overnight school trips, prom, and/or parties.

**Risky drinking practices**—Participants completed the Alcohol Use Disorders Identification Test (AUDIT; Saunders, Aasland, Babor, de la Fuente, & Grant, 1993), a 10-item, standardized screening measure designed to assess hazardous alcohol use within the

past year. Items are summed, with higher scores indicating elevated levels of hazardous use. Although the AUDIT was created as a screening instrument for alcohol use disorders in primary health care settings, it has been validated for use with adolescents (Chung, Colby, Barnett, & Monti, 2002; Knight, Sherritt, Harris, Gates, & Chang, 2003) in assessing level of risk for a spectrum of problematic drinking outcomes (for review see Reinert & Allen, 2002, 2007). Cronbach's alpha of the AUDIT for the present sample was .67. Drinking game participation in the past 30 days was assessed using a 4-point scale (0 = *Never*, 1 = *Once*, 2 = *Two to Four Times a Month*, 3 = *Two to Three Times or More a Week*) similar to one used in previous research (Adams & Nagoshi, 1999).

**Drinking motives**—Participants completed the 20-item Drinking Motives Questionnaire Revised (DMQ-R; Cooper, 1994). Students indicated the frequency with which they drank alcohol for a variety of reasons using a 5-point scale (1 = *Never/Almost Never*, 2 = *Some of the Time*, 3 = *Half of the Time*, 4 = *Most of the Time*, 5 = *Almost Always/Always*). We calculated mean scores for each subscale: social, coping, enhancement, and conformity motives. Very few students endorsed conformity motives and despite efforts to Winsorize as well as transform (square root and log transformations) these motives, they remained non-normally distributed. As such, we focused on social (e.g., "Because it makes social gatherings more fun"), enhancement (e.g., "Because it's exciting"), and coping (e.g., "To forget about my problems") motives. Cronbach's alphas for these subscales were .86, .92, and .85, respectively.

**Alcohol expectancies**—Students completed the 15-item Brief Comprehensive Effects of Alcohol Scale (Ham, Stewart, Norton, & Hope, 2005), which measures positive (e.g., "I would act sociable") and negative (e.g., "I would feel dizzy") alcohol expectancies (i.e., expectations about the effects of alcohol use) and valuations of these expectancies (i.e., the extent to which a student believes a certain effect to be 'good' or 'bad'). Students reported their level of agreement with each expectancy statement using a 4-point scale (1 = *Disagree* to 4 = *Agree*), as well as their valuations of these expectancy outcomes using a 5-point scale (1 = *Bad* to 5 = *Good*). We computed mean scores for positive ( $\alpha = .62$ ) and negative ( $\alpha = .73$ ) expectancy outcomes as well as positive ( $\alpha = .77$ ) and negative ( $\alpha = .76$ ) valuations for each participant.

**Alcohol use in social contexts**—Students reported how often they attend parties where there is alcohol available using a 5-point scale (0 = *Never*, 1 = *Once a Month*, 2 = *Two or Three Times a Month*, 3 = *Once a Week*, 4 = *Two or More Times a Week*) as well as how often they drink at parties where alcohol is available using a 4-point scale (0 = *Never*, 1 = *Sometimes*, 2 = *Often/Usually*, 3 = *Always*). Participants who indicated that they drink at parties where alcohol is available also reported how much they typically drink at these events using a 5-point scale (1 = *One or Two Drinks*, 2 = *Three or Four Drinks*, 3 = *Five or Six Drinks*, 4 = *Seven or Eight Drinks*, 5 = *Nine or More Drinks*).

## Results

### Descriptive Characteristics of the Sample

First, we compared the demographic characteristics of the study sample and the high school student population (at the time of data collection) from which it was drawn. Descriptive statistics indicated that they were similar with respect to mean age (15.7 vs. 15.6; respectively), and across gender (girls, 53% vs. 50%; boys, 47% vs. 50%; respectively) and ethnicity (White, 76% vs. 79%; non-White, 24% vs. 21%, respectively).

Next, we compared the prevalence of alcohol use in our school-based sample to a national survey of youth (Centers for Disease Control and Prevention, 2010; CDC). Descriptive statistics indicated that 42.6% of the students (girls, 46.6%; boys, 39.1%) in the school-based sample reported that they had at least one drink of alcohol in the 30 days prior to assessment. By comparison, national and statewide data indicate that 41.8% (girls, 42.9%; boys, 40.8%) and 43.6% (girls, 44.5%; boys, 42.7%) of students, respectively, had at least one drink of alcohol in the 30 days prior to testing (CDC, 2010).

Finally, we examined the drinking characteristics of the data analytic sample of the present study. Approximately half (48%) of all participants reported that they pregame at least once in the 30 days prior to assessment. Among pregamers, the mean number of times pregame in the past 30 days was 2.31 ( $SD = 1.60$ , range = 1–6); 45% reported pregame one time, 23% pregame two times, and 32% pregame three times or more in the past 30 days. The mean AUDIT total score was 6.76 ( $SD = 4.50$ , range = 1–27) for the total sample, 8.77 among current pregamers, and 4.92 for non-pregamers. Nearly 70% of all participants indicated that they played DG at least once in the past 30 days. The mean frequency of DG participation in the past 30 days was 1.21 ( $SD = .97$ , range = 0–3) for the total sample, 1.64 among current pregamers, and .80 for non-pregamers.

**Research Question 1: Are gender, age, cognitions about alcohol use, and engagement in other risky drinking practices predictive of students' likelihood of pregameing?**

We conducted logistic regression to examine predictors of pregameing (Table 1). Results indicated that being older, having high levels of hazardous alcohol use, and participating in DG frequently significantly predicted increased odds of pregameing. None of the other variables emerged as significant predictors in the model.

**Research Question 2: Among students who pregame, are gender, age, cognitions about alcohol use, and other risky drinking practices associated with students' reported frequency of pregameing?**

We constructed a linear regression model to examine the predictors of frequency of pregameing among those 111 students who reported pregameing (Table 2). Results indicated that being male and having high levels of hazardous alcohol use were significantly associated with increased frequency of pregameing,  $F(11, 90) = 3.23$ ,  $p = .001$ , model  $R^2 = .28$ . No other significant associations were found.

**Research Question 3: What is the most common type of social event high school students report pregameing for and how might pregameing be related to subsequent alcohol use in this social context?**

A large proportion of pregamers reported that they pregame for parties (82%), followed by night sporting events (66%), prom (24%), and overnight school trips (6%). We also conducted supplemental analyses among students who reported that they pregame for parties ( $n = 91$ ). Specifically, we examined whether frequency of pregameing would be positively associated with frequency of attendance at parties where alcohol is available and consumption levels at these parties. Results indicated a positive association ( $r = .36$ ,  $p = .001$ ) between frequency of pregameing and frequency of attendance at parties where alcohol is available ( $M = 2.52$ , where 2 = *Once a Month* and 3 = *Two or Three Times a Month*). Frequency of pregameing was also positively associated ( $r = .38$ ,  $p < .001$ ) with tendency to use alcohol at these parties ( $M = 2.01$ , where 2 = *Often/Usually*) and with the amount of alcohol consumed ( $r = .47$ ,  $p < .001$ ) while there ( $M = 3.00$ , where 3 = *Five or Six Drinks*).

## Discussion

This study was conducted to advance the extant literature on pregameing among high school students by examining other factors that predict this specific risky drinking behavior in an understudied population to inform intervention efforts. Results showed that being older, having high levels of hazardous alcohol use, and participating in DG frequently significantly predicted increased odds of pregameing. A high proportion of pregameers reported that they pregameed before parties and sporting events. Results also indicated that those who pregame more often tend to be boys and also report higher levels of hazardous use than those who pregameed less frequently.

With the exception of the direction of the association between pregameing and age, these findings are consistent with prior research on pregameing with college student samples (e.g., Kenney et al., 2010; LaBrie & Pedersen, 2008; Pedersen & LaBrie, 2007; Read et al., 2010; Wei, Barnett, & Clark, 2010). The discrepancy in the direction of the association between pregameing and age among high school and college samples may be because, compared to college students, high school students are younger and tend to have less experience with alcohol. Thus, as high schoolers get older and gain more experience with alcohol use, they may begin to increase participation in risky drinking practices such as pregameing. Conversely, for college students, involvement with pregameing may predominate during the early college years when access to alcohol or places where alcohol is served (e.g., bars) is limited due to age restrictions.

In contrast to college students, pregameing in high school students was not associated with alcohol cognitions such as motives to drink alcohol and alcohol expectancies. One possible reason for this finding is that compared to college students, high school students' alcohol expectancies are less developed and differentiated given their age and experience with alcohol consumption. It is unclear, however, why social, enhancement, and coping motives for drinking were not associated with pregameing in this student population. Perhaps there are other motives that were not captured by the DMQ-R that explain high school students' pregameing behaviors. The context in which pregameing occurs might also be important to consider. The association between coping motives and pregameing might be particularly relevant for students who pregameed alone before attending a social event (e.g., drinking to cope with anxiety before attending a social event) as compared to those who pregameed in a group context. In the latter case, one might expect to find social, conformity, and perhaps even enhancement motives to be of particular relevance. Thus, the context in which pregameing occurs may need to be disentangled in order to fully understand how drinking motives might be associated with pregameing among high schoolers.

### Study Implications

**College-bound individuals**—The prevalence of pregameing in high school has serious implications for those students going on to college, as pre-matriculation drinking consistently predicts first year alcohol use (Grekin & Sher, 2006; Hartzler & Fromme, 2003; Read, Wood, Davidoff, McLacken, & Campbell, 2002). Specifically, many first-year students go to college with established drinking patterns and attitudes which are generally maintained or increased during the first year at school (Borsari, Murphy, & Barnett, 2007).

**Non-college bound individuals**—For those students who do not attend college, the prevalence of pregameing is also of concern. Specifically, pregameing is highly associated with hazardous levels of alcohol use, leading to increased risk for alcohol-related consequences. In particular, individuals who maintain the same peer group with which they engaged in pregameing during high school after matriculation may be at particular risk due to the maintenance of established high-risk drinking behaviors within this context.

Furthermore, the very definition of pregaming indicates that alcohol is consumed before going to another event. While in the college setting it is possible that the other event may not require vehicular-transport students might be proceeding to another function on campus, in non-college bound individuals it is more likely that driving will be required to arrive at the ultimate destination (e.g., a party at another house, a bar).

### Clinical implications

One implication of these findings is the need to address pregaming in any intervention for hazardous alcohol use among high school students. This recommendation is in line with prior research with college freshmen which found that engaging in just one alcohol-related risk behavior (i.e. either prepartying or drinking games) puts these students at the same amount of risk for negative alcohol-related consequences as engaging in both behaviors (Kenney et al., 2010). Highlighting the risks of these activities and providing alternate skills, such as drink refusal, may lessen the chances of high school students experiencing alcohol-related consequences. While provision of such skills assumes that pregaming is socially influenced (which may often be the case), before programmers and service providers integrate pregaming as a topic in preventive interventions with adolescents, further research is needed to elucidate how certain motives (e.g., to get oneself and/or others drunk; to save money) for pregaming are linked to negative alcohol-related outcomes.

Even for students who are not actively participating in these activities, engagement in pregaming and DG appears to be a part of the drinking culture and addressing these behaviors in the context of an intervention may increase the relevance of intervention and prevention efforts with high school students (see Wagner, Tubman, & Gil, 2004).

Another implication of these findings is the need to be mindful of demographic and contextual factors and their relevance to risky drinking practices among high school students. Intervention and prevention efforts designed to address hazardous alcohol use in this population could pay careful attention to boys and older adolescents given the finding that these populations are more likely to pregame and do so more frequently than girls or younger adolescents. Moreover, because students reported that they often pregame before parties and sporting events, practitioners and school personnel should be mindful of specific contexts (e.g., Friday night football games; end of the school year parties) in which heavy consumption is likely to occur and should take precautionary measures (e.g., school-wide social norms campaign strategies; parent education and awareness) to help prevent negative drinking outcomes from occurring on such occasions.

### Limitations and Future Research Directions

There are some study limitations that deserve mention. First, we used self-report data without collateral verification, and although anonymous survey testing can yield accurate self-reporting of behaviors, it is possible that students provided underestimates or overestimates of their general hazardous use and participation in pregaming and DG activities. Second, the cross-sectional study design also precludes any inferences of causality or conclusions about temporal ordering regarding the associations between the study variables. Third, the present study did not assess students' college enrollment plans and as such, longitudinal research would help determine whether these risky behaviors and their sequelae continue after graduation for this population. Fourth, the sample was predominately White students attending a high school in the northeastern United States, limiting the generalizability of the findings. Fifth, although the social contexts for pregaming options (i.e., night sporting events, overnight school trips, prom, and/or parties) were developed based on the recommendations of school personnel at the study site, response choices were limited. In addition, we did not provide respondents with a specific time frame (e.g., past



month, past year, etc.) to be referred to when answering the alcohol use in social context questions. As such, future research should examine a broader array of social contexts in which pregaming may occur among high school students and should specify the time frame to be referred to by respondents when answering questions about alcohol use in these contexts.

Sixth, we acknowledge that the alphas for the AUDIT total scores ( $\alpha = .67$ ) and the positive expectancy outcome subscale ( $\alpha = .62$ ) were slightly below .70. Although a common alpha cut-off is .70 or higher, Kent (2001) proposed that alphas of .50 or .60 are acceptable for preliminary research such as this study. Finally, our sample size may have been too small to detect medium to small effects among the variables. For example, post-hoc power analyses for our linear regression model indicated that the sample size of the pregamers was not sufficient to detect small to medium effects. Future research with larger, more diverse samples of high school students will enhance our understanding of alcohol cognitions (alcohol expectancies and drinking motives) and their relevance to pregaming behaviors in this population.

In sum, pregaming is prevalent among high school students, particularly among boys and older high school students, and is associated with risky alcohol use and DG participation. Therefore, it is a valuable target for prevention and intervention efforts with this population. Research on pregaming (particularly among adolescents) remains quite limited, despite its prevalence and the negative health consequences associated with this drinking behavior. We hope that this preliminary study will stimulate more research designed to inform alcohol intervention and prevention efforts that are intended to facilitate adolescents' healthy transition into young adulthood.

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**Table 1**

Logistic Regression Predicting Pregaming from Demographics, Risky Drinking Practices, and Alcohol Cognitions

Classification analysis	$\chi^2$		% correct
Model	68.44 ***		76%
Model statistics	B	SE	Odds Ratio [Exp(b)]
<b>Demographics</b>			
Age	.42 *	.16	1.52
Gender <sup>a</sup>	.07	.34	1.08
<b>Risky Drinking Practices</b>			
General Hazardous Alcohol Use(AUDIT Total Scores)	.15 **	.05	1.17
Drinking Games Participation	.62 **	.21	1.87
<b>Alcohol Cognitions</b>			
Sociability Drinking Motives	.09	.22	1.09
Enhancement Drinking Motives	.19	.19	1.21
Coping Drinking Motives	-.22	.20	.80
Positive Expectancy Outcomes	-.21	.45	.81
Negative Expectancy Outcomes	-.06	.31	.95
Positive Expectancy Valuations	-.28	.29	.76
Negative Expectancy Valuations	.30	.24	1.35

Note.  $N = 213$ , Nagelkerke  $R^2 = .37$ . All betas are standardized. Significance of individual predictor coefficients (based on the Wald statistic)

\*  $p < .05$

\*\*  $p < .01$ ;

<sup>a</sup> Coded as girls = 0 and boys = 1.

**Table 2**

Associations of Demographics, Risky Drinking Practices, and Alcohol Cognitions with Frequency of Pregaming among Pregamers

Variable	B	SE	Beta
<b>Demographics</b>			
Age	.14	.15	.10
Gender <sup>a</sup>	.87	.31	.28**
<b>Risky Drinking Practices</b>			
General Hazardous Alcohol Use (AUDIT Total Scores)	.09	.04	.22*
Drinking Games Participation	.24	.19	.13
<b>Alcohol Cognitions</b>			
Social Drinking Motives	-.08	.19	-.05
Enhancement Drinking Motives	.04	.19	.02
Coping Drinking Motives	.07	.17	.04
Positive Expectancy Outcomes	.19	.43	.06
Negative Expectancy Outcomes	-.24	.29	-.09
Positive Expectancy Valuations	.05	.26	.03
Negative Expectancy Valuations	.25	.21	.13

Note.  $N = 101$ , Model  $R^2 = .28$ ,  $F(11, 90) = 3.23$ ,  $p = .001$ ;

\*\*  $p < .01$ ,

\*  $p < .05$ .

<sup>a</sup> Coded as girls = 0 and boys = 1.