



Characterizing high school students who play drinking games using latent class analysis



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HIGHLIGHTS

- Conducted assessments with high school students reporting drinking game participation
- Latent class analysis used to investigate negative consequences from gaming
- Three classes emerged: lower-risk, higher-risk, and sexual regret groups.
- Participation and frequency of playing drinking games are not ideal indicators of risk.

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ABSTRACT

Heavy alcohol use and its associated negative consequences continue to be an important health issue among adolescents. Of particular concern are risky drinking practices such as playing drinking games. Although retrospective accounts indicate that drinking game participation is common among high school students, it has yet to be assessed in current high school students. Utilizing data from high school students who reported current drinking game participation ($n = 178$), we used latent class analysis to investigate the negative consequences resulting from gaming and examined underlying demographic and alcohol-related behavioral characteristics of students as a function of the resultant classes. Three classes of “gamers” emerged: (1) a “lower-risk” group who had a lower probability of endorsing negative consequences compared to the other groups, (2) a “higher-risk” group who reported that they experienced hangovers and difficulties limiting their drinking, got physically sick, and became rude, obnoxious, or insulting, and (3) a “sexual regret” group who reported that they experienced poor recall and unplanned sexual activity that they later regretted. Although the frequency of participating in drinking games did not differ between these three groups, results indicated that the “lower-risk” group consumed fewer drinks in a typical gaming session compared to the other two groups. The present findings suggest that drinking games are common among high school students, but that mere participation and frequency of play are not necessarily the best indicators of risk. Instead, examination of other constructs such as game-related alcohol consumption, consequences, or psychosocial variables such as impulsivity may be more useful.

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1. Introduction

Heavy drinking among adolescents and its associated health risks continue to be an important public health concern. According to the 2009 Youth Risk Behavior Survey, 24.2% of high school students

consumed five or more drinks in a row on at least one day in the past month (Centers for Disease Control and Prevention [CDC], 2010). Furthermore, 9.7% of high school students reported driving after drinking in the past 30 days, and 21.6% of sexually active students consumed alcohol or used drugs before their last sexual intercourse. Notably, 21.1% of high school students initiated alcohol use before the age of 13. Early alcohol initiation has been linked to subsequent alcohol misuse and other alcohol-related problems years later (Buchmann et al., 2010; Dawson, Grant, & Li, 2007). Moreover, the initiation and establishment of risky drinking patterns in high school

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have been shown to predict problematic drinking later in life (e.g., Hersh & Hussong, 2006; Zucker, 2008). Studies on risky drinking practices among high school students are needed to further researchers' understanding of such behaviors and to inform prevention efforts in this population.

Participation in drinking games has been identified as a common drinking practice among high school students. In drinking games, alcohol consumption is governed by rules often with the goal to get each drinking game participant (or "gamer") intoxicated (for reviews, see Borsari, 2004; Kenney, Hummer, & Labrie, 2010). Consequently, it is common for gamers to consume large amounts of alcohol in a short time period. Three retrospective studies conducted with incoming or first-year college students in the United States indicate that participation in drinking games is widespread during high school. In one study, a survey of 1252 high school graduates attending a pre-college orientation program found that 63% reported lifetime participation in drinking games (Borsari, Bergen-Cico, & Carey, 2003), while in another study approximately 20% of 1891 incoming first-year college students reported that they currently played drinking games (Croom et al., 2009). A third study with 477 first-year college students by Kenney et al. (2010) showed that approximately 54% played drinking games during the last months of high school. Despite these retrospective indications that drinking games are common in high school, drinking game participation and related consequences have yet to be assessed in current high school students in the US. Research conducted in a large sample of Norwegian high school students found that older students and heavier drinkers reported participation in drinking games (Pedersen, 1990). The limited research on drinking games in high school students extends to our understanding of the negative consequences associated with drinking game participation in this population. Drinking games have a strong association with alcohol-related social, psychological, and health consequences in the college setting (e.g., Cameron et al., 2010; Johnson & Stahl, 2004; Pedersen & Labrie, 2006; Zamboanga, Leitkowski, Rodriguez, & Cascio, 2006), but no research has examined game-specific consequences in high school students.

The purpose of the present study was to examine the demographic and alcohol-related behavioral characteristics of current high school students who reported playing drinking games. This study contributes to the limited research on adolescent participation in drinking games in three important ways. First, we sought to explore the association of student characteristics such as age, gender, and engagement in other forms of risky drinking (e.g., pregameing) with participation in drinking games in a sample of high school students. For example, prior research has found that those who used alcohol before the age of 14 were more likely to drink to deal with negative stressors and to develop alcohol-related problems later in life than those who used alcohol after the age of 14 (e.g., Buchmann et al., 2010). In addition, patterns of adolescent drinking have been linked to a variety of constructs such as impulsivity, motives, alcohol-related expectancies, self-esteem, and parental monitoring (e.g., Colder, Campbell, Ruel, Richardson, & Flay, 2002; Kuntsche, Stewart, & Cooper, 2008; Stice, Barrera, & Chassin, 1998). Therefore, we examined differences in these constructs among students who participate in drinking games and those who do not.

Second, given the complete lack of research on drinking-game related consequences in high school students, we measured a variety of negative social, psychological, behavioral, and health consequences experienced as a result of playing drinking games in order to directly link alcohol-related consequences with gaming behaviors. This approach is in contrast with previous drinking game research (e.g., Adams & Nagoshi, 1999; Cameron et al., 2010; Pedersen & LaBrie, 2006) that focused on general alcohol-related consequences, which made it difficult to ascertain whether reported consequences are directly related to drinking game participation or to other risky drinking practices (e.g., heavy episodic drinking, pregameing, hazing practices, 21st birthday celebrations that involve the heavy use of alcohol).

Finally, to further explore how these consequences might be explicitly linked to drinking game participation, we used latent class analysis (LCA) to classify high school drinking gamers based on their endorsement of negative gaming consequences. We then examined the differences among these classes on our battery of demographics and alcohol-related behaviors and cognitions. In this way, we sought to determine whether these classifications could prove to be useful in identifying particular subgroups within the population of high school gamers who are experiencing negative consequences.

Given the lack of data on the correlates and consequences of drinking game participation among current high school students, our approach to data analysis was descriptive and exploratory. However, given the previous work of Pedersen (1990), we hypothesized that the classes of drinking game participants would differ significantly by age and alcohol consumption.

2. Materials and method

2.1. Participants

Participants were drawn from a larger, high school-based study of youth substance use behaviors and attitudes conducted at a high school in the northeastern United States ($N = 594$; 595 questionnaires were administered, 594 were completed as instructed; ~70% of the student body participated in the study). For the purpose of this study, we restricted the sample to those students who reported that they consumed alcohol at least once in the past 30 days. This subsample ($n = 252$) represents 42% of the total study sample (48% boys; mean age = 16.1, $SD = 1.11$, range = 14–18; 76% White, 2% Black, 2% Hispanic, 1% Asian, 1% American Indian, 16% Mixed/other; 13% Freshmen, 22% Sophomores, 30% Juniors, 35% Seniors).

2.2. Procedures

Researchers mailed information about study participation and a parental consent form to parents of all students enrolled at the study site. This study used an active consent procedure in which parents were asked to sign and return the consent form indicating whether or not they permitted their child's participation. Only those students with parental permission were allowed to participate. All students who returned a signed parental consent form, regardless of whether participation was permitted or declined, were entered into a drawing to win one of several prizes. In addition, the school received a monetary donation for helping with the data collection logistics 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 participation decision). Students who received parental permission to participate completed anonymous surveys (which were administered by a trained research assistant) during a class period while students without parental consent worked at their desks. The questionnaire took ~30–45 min to complete. Participants returned their completed survey to a "ballot" box and then received a written debriefing form from the research assistant. Students were assured that the information they provided would be anonymous. The Smith College Institutional Review Board (IRB) and the local school district approved all procedures and granted a *waiver of written assent*; thus, the research assistants read to the students their rights as a participant in the study and the students in turn provided their verbal assent to participate.

2.3. Measures

2.3.1. Demographics

Participants reported their age, gender, membership on a varsity athletic team, and grades. Student were asked to describe their grades using a response scale that ranged from 0 (*mostly Fs*) to 9 (*mostly As*)

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