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Predictors of drinking patterns in adolescence: A latent class analysis



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ABSTRACT

Background: Uni-dimensional measures of alcohol consumption may be unable to fully capture the complexity of adolescent drinking and experience of alcohol-related harms. Latent class analysis provides an empirical method to understand different adolescent drinking patterns.

Methods: Latent class analysis was used to create typologies of drinking among the 5018 current drinkers in the national Youth '07 survey. Determinants of drinking patterns were identified using multinomial logistic regression.

Results: Four latent classes were identified, demonstrating an overall increase in risk of alcohol-related outcomes from increasing consumption. One class strongly deviated from this pattern, having moderate consumption patterns but disproportionately high levels of alcohol-related problems. Multinomial logistic regression found that the strongest predictors of belonging to high-risk drinking typologies were having a positive attitude to regular alcohol use, buying own alcohol, peers using alcohol, and obtaining alcohol from friends and/or other adults. Other significant predictors included being male, having a strong connection to friends, having parents with a low level of knowledge of their daily activities and poor connection to school. Class membership also varied by ethnicity.

Conclusion: The latent class approach demonstrated variability in alcohol-related harms across groups of students with different drinking patterns. Longitudinal studies are necessary to determine the causes of this variability in order to inform the development of targeted policy and preventative interventions. Legislative controls, such as increasing the legal purchase age and reducing the commercial availability of alcohol, will continue to be important strategies for reducing harm in young people.

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1. Introduction

Effective, preventative interventions to reduce adolescent alcohol use must address the most significant risk and protective factors of underage drinking. The social development model (Catalano and Hawkins, 1996) guides the identification of relevant contextual factors within a target population by suggesting that adolescents learn patterns of behavior from their primary units of socialization including peers, family, and school.

A number of systematic reviews have identified the most salient peer (Leung et al., 2011), family (Hayes et al., 2004) and

school-related factors (Fletcher et al., 2008) in the initiation and use of alcohol during adolescence. However, given the heterogeneity in the measurement of alcohol use in these reviews it remains uncertain as to how each of these factors is associated with different levels (or types) of drinking.

Understanding drinking typologies is necessary to inform the development of appropriate intervention and policy approaches. Researchers (Carey, 2001; Gmel et al., 2011; White, 1987) are increasingly calling for a move away from broad classifications of drinkers (e.g., binge drinkers) to considering more distinct types of drinkers. For example, it is claimed that the averaging across binge drinkers in studies is likely to combine different types of drinkers with very different frequencies of binge drinking and/or amounts consumed, masking potentially different levels of risk of alcohol-related harms. Consequently, there are compelling reasons to undertake research that can differentiate regular heavy drinkers from those who demonstrate risky episodic patterns of drinking.

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Researchers also argue that such insensitivity to differences in drinking patterns will obscure the understanding of risk relationships associated with lower levels of drinking (Thompson et al., 2012). Studies have found that drinkers who consume low and moderate volumes with occasional episodes of risky binge drinking account for the majority of alcohol-related problems (e.g., accidents, problems at work; Dawson, 2011; Gmel et al., 2001). Among adolescents and young adults, the association between consumption and alcohol-related concerns may begin with consumption levels as low as two drinks per occasion (Gruenewald et al., 2010; Thompson et al., 2012).

The failure of uni-dimensional measures to capture the complexity of adolescent drinking and experience of alcohol-related harms has resulted in the use of more sophisticated methods, such as latent class analysis, to identify drinking typologies and risks associated with varying types of drinking (Percy and Iwaniec, 2007; Wells et al., 2004). This categorical, person-centred approach is argued to be more appropriate for alcohol-related questions, as it focuses on the relationships among individuals who are similar to each other in their drinking pattern and different from individuals in other drinking typologies (Muthen and Muthen, 2000). Despite the opportunities afforded by these methods to describe more nuanced typologies of drinking, there has been inconsistency in the selection and definition of variables (e.g., frequency of drinking, binge drinking, amount typically consumed and experience of alcohol-related outcomes) to construct drinking typologies (Cable and Sacker, 2008). Consequently, comparisons between studies remain difficult.

Using a comprehensive data resource from a nationally representative health and well-being survey of New Zealand secondary school students, the current study aims to identify adolescent drinking profiles and to determine if these profiles are differentiated by levels of risk and protective factors.

2. Methods

The anonymous, computer-assisted survey was self-administered to 9107 New Zealand secondary schools students in 2007, using hand-held internet tablets. The survey contained 622 questions covering a broad range of health and wellbeing issues, including alcohol use.

One hundred and fifteen schools were randomly selected for participation, from the 389 eligible secondary schools in New Zealand. Eighteen per cent of eligible students (or 30 students if the roll was less than 166) were randomly selected from each school's roll and invited to participate. The school and student response rate were 84 and 74% respectively. The survey instrument (Adolescent Health Research Group) and a detailed description of the survey methodology are available elsewhere (Adolescent Health Research Group, 2008).

Latent class analysis was used to examine the underlying structure of co-occurring drinking behaviors and associated alcohol-related problems among the current drinkers. Current drinkers were defined as students who stated that they had consumed alcohol and did not indicate they no longer drank. Seven binary parameters were used to create homogeneous groups with similar drinking patterns, three of which were consumption measures: (1) frequency of consumption in the past 4 weeks (not at all or up to 3 times, once a week or more); (2) number of standard drinks typically consumed during a drinking occasion (1–4 drinks, 5+); and (3) frequency of binge drinking (5 or more drinks) during the past 4 weeks (none to once in the last 4 weeks, twice or more). Four self-reported problems associated with the young person's drinking (referred from hereon as 'alcohol-related outcomes') were also included: having performance at school or work affected,

having unsafe sex and/or unwanted sex, doing things that could have resulted in serious trouble (e.g., stealing), been injured and/or injuring another and/or being involved in a car crash. Students were asked to report whether they had experienced any of the outcomes in the previous 12 months.

2.1. Predictors of latent class membership

A range of individual, peer, family, and school factors related to adolescent drinking were included in the analysis. All composite scales relating to peer, school, and family connection were drawn from the Adolescent Resilience Questionnaire (Gartland et al., 2011).

2.1.1. Individual factors.

(a) Demographics: Age, gender, and ethnicity were determined by self-report. Ethnicity was categorized and prioritized into one of four ethnic groups, according to the New Zealand census ethnicity question (Statistics New Zealand, 2007): Māori, Pacific, Asian, and New Zealand European or Other ethnicity.

Socioeconomic status (SES) was determined using a combination of measures including the 2006 New Zealand Deprivation Index (Salmond et al., 2007) and other indicators of deprivation (i.e., use of a sleep-out for a bedroom, perception that parents worry about having enough money to buy food, number of times the young person has moved home and absence of TV, computer, mobile, phone, or car at the family home). The combined SES measure was found to have an acceptable reliability (Cronbach's $\alpha = 0.67$).

(b) Other individual factors included having a regular job outside of school hours in the last year, belonging to a sports team or club outside of school time or in the weekend, buying their own alcohol, and having a permissive attitude to regular alcohol use by people their age. Students who responded "yes" were compared to students who answered "no".

2.1.2. Peer factors. Three peer variables were analyzed: peer use of alcohol, acquisition (i.e., social supply) of alcohol from friends and/or another adult (i.e., other than parents), and connection to friends. The latter measure was determined by responses from a number of survey questions, including number of friends, ability to make and keep friends, having a group of friends to hang out with and have fun, having close friends, perceiving that friends care, having friends that like doing the same thing, and having friends that help out ($\alpha = 0.77$).

2.1.3. Family factors. Four family factors were included: parental alcohol use, parents supplying alcohol to the young person, connection to family, and parental knowledge of youth daily activities. Connection to family was a composite measure of questions relating to the frequency of the family having fun together, perceptions of family relationships and closeness, and time spent with parents ($\alpha = 0.84$). Parental knowledge of youth daily activities (hereon referred to as 'parental knowledge') was composed of three questions relating to how well the young person's parents knew about their friends and where they go after school and at night ($\alpha = 0.67$).

2.1.4. School factors. A composite measure, assessing connection to school, was chosen as the predictor within the school setting. This measure assessed the young person's perceptions about how they feel about school, whether they feel part of the school, whether people at school care about them, whether teachers go out of their way to help students and whether they show a special interest in the young person's culture or ethnic group. The measure also

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