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Short Communication

One of these things is not like the others: Testing trajectories in drinking frequency, drinking quantity, and alcohol-related problems in undergraduate women

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HIGHLIGHTS

- Trajectories of alcohol consumption and related problems are poorly understood in undergraduate women.
- We assessed alcohol frequency, quantity, and alcohol-related problems at four waves over 18 months.
- Frequency of alcohol use remained relatively stable over time.
- Quantity of alcohol use and alcohol-related problems decreased over time.
- Results support the maturation hypothesis for most, but not all, aspects of alcohol use in women.

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ABSTRACT

Alcohol misuse is an increasingly common problem in undergraduate women. Building upon research suggesting that maturing out of risky patterns of alcohol use can occur, our study tested how three facets of alcohol use change differentially over time in undergraduate women. A sample of 218 undergraduate women (M age = 20.6 years) participated in a four-wave, 18-month longitudinal study measuring frequency of alcohol consuming occasions, quantity of alcohol consumed per occasion, and alcohol-related problems. Growth curve analyses showed that alcohol frequency remained stable over 18 months, whereas alcohol quantity and problems decreased over time. Results indicate undergraduate women are drinking with similar frequency over time, but they are drinking a smaller quantity of alcohol per drinking occasion and they are experiencing fewer alcohol-related problems. Findings help clarify the maturity principle by showing a different pattern of drinking as undergraduate women age that involves lower quantities of alcohol per drinking occasion and less problematic alcohol use, but not necessarily less frequent drinking.

1. Introduction

Alcohol consumption is heavier among undergraduates than the general population, even relative to same-aged peers (Hoeppner et al., 2012). Undergraduates are at heightened risk for alcohol-related problems (Grekin & Sher, 2006), which have lasting consequences for health, education, and work achievement (Jennison, 2004). Men typically show increased risk for alcohol-related problems relative to women (Stewart, Gavric, & Collins, 2009) but alcohol consumption in young women has increased in recent years (Ragsdale et al., 2012) and is nearing levels of young adult men (i.e., gender convergence; Stewart et al., 2009). Research suggests risky alcohol use manifests differently across gender, and women may experience unique motivations and risk factors for alcohol use (Smith & Berger, 2010). New female-specific drinking guidelines (Tan, Denny, Cheal, Sniezek, & Kanny, 2015) highlight the need for female-specific research in this area.

Alcohol use often declines in young adulthood, reflecting a pattern commonly called "maturing out" (Johnson, Hicks, McGue, & Iacono, 2007) or the maturity principle. The development of safer drinking levels during this time mirror maturation in other ways, including more global decreases in risk-taking behaviour (Littlefield, Sher, & Wood, 2009) and reflects the transition into adult roles (Littlefield et al., 2009). Longitudinal research (O'Neill & Sher, 2000) of mixed-gender undergraduates showed frequency of drinking remained

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moderately stable over time, whereas frequency of heavy drinking remained stable during university but decreased significantly post-graduation. Alcohol quantity remained stable for the first three years of university, but subsequently decreased in fourth year and post-graduation (O'Neill & Sher, 2000). This decrease in drinking quantity during university was consistent with previous research showing fewer heavy drinkers in fourth vs. first year of university (Johnson et al., 2007). Similar work by Grekin and Sher (2006) found a gradual decrease in alcohol dependence symptoms over the first year of university.

Testing the maturity principle with a mixed-gender sample may be problematic. While undergraduate men show overall increases in alcohol use over time, undergraduate women show either stable drinking patterns (McCabe et al., 2005; Testa & Hoffman, 2012) or declines in drinking consistent with the maturity principle (Johnson et al., 2007). Trajectories of alcohol use in undergraduate women are equivocal and much remains to be learned about how differing measures of consumption and alcohol-related problems change according to the maturity principle.

We addressed these issues in a sample of undergraduate women using a four-wave, 18-month longitudinal design while testing patterns of alcohol consumption (quantity and frequency of use) and alcohol-related problems. These measures are distinct from one another, have different outcomes (Stewart, Angelopoulos, Baker, & Boland, 2000), and should be assessed separately yet simultaneously in a single study. Because alcohol dependence is only one facet of problematic alcohol use, broader investigation of alcohol-related problems better captures problematic alcohol use that may not reach diagnostic criteria for alcohol dependence or withdrawal.

Based on the maturity principle (Johnson et al., 2007) and previous research (O'Neill & Sher, 2000), we hypothesized drinking quantity, frequency, and problems will show a decreasing trajectory across 18 months, even after controlling for participant age. We expected greater decreases for drinking quantity and alcohol-related problems relative to drinking frequency based on research demonstrating stability of frequency over time (Mushquash, Sherry, Mackinnon, Mushquash, & Stewart, 2014; O'Neill & Sher, 2000).

2. Material and methods

2.1. Participants

We recruited 207 undergraduate women who reported drinking on ≥4 occasions per month over the past six months (Grant, Stewart, & Mohr, 2009). All participants completed wave one, 179 (82.1%) completed wave two, 159 (72.9%) completed wave three, and 139 (63.8%) completed wave four. No study variables predicted attrition across waves. At wave one, participants were between age 17 and 25 (M = 20.0, SD = 1.8) and 92.2% identified as Caucasian. At wave one, 34.0% were in their first year of university, 23.3% in second year, 21.4% in third year, 14.1% in fourth year, and 7.3% in fifth year or above. Sample demographics were comparable to other samples of regular drinkers at Dalhousie University (e.g., Mushquash et al., 2013).

2.2. Measures

The Lifestyles Questionnaire (Grant et al., 2009) measured *frequency* of alcohol consumption ("During the past 6 months, how often did you normally drink alcohol?") and *quantity* of alcohol consumption per occasion ("During the past 6 months, how much did you typically drink when you drank alcohol?"). Participants provided a numerical response to indicate the number of days per week or the number of standard drinks consumed, respectively. Written and pictorial information defining a standard drink was provided. Self-report measures of drinking are reliable and valid when embedded among other questions to reduce their salience, when questions are open-ended, and when confidentiality is assured (Sobell & Sobell, 1990). These conditions were met in our study. Research supports the validity of these measures in undergraduates (Bloomfield, Hope, & Kraus, 2013).

Alcohol-related problems were measured with the Rutgers Alcohol Problem Index (RAPI; White & Labouvie, 1989). This 23-item questionnaire assesses severity of problems related to alcohol consumption (e.g., "Not able to do your homework or study for a test") and is designed to assess alcohol problems experienced by young people. Responses are scored on a 0–4 scale ranging from "never" to ">10 times." Alpha reliabilities in our sample were high (0.87 to 0.93 across waves). The RAPI has adequate validity in undergraduates (Martens, Neighbors, Dams-O'Connor, Lee, & Larimer, 2007).

2.3. Procedure

The university research ethics board approved this study. Participants provided four waves of data spaced six months apart during an 18-month period. We used rolling recruitment, with participants starting at varying times during the academic year. Measures were embedded within a battery of questionnaires and were identical across waves. Participants attended the lab at wave one to provide informed consent to participate and be contacted at 6, 12, and 18 months (i.e., waves two, three, and four) to complete online questionnaires. Research suggests online measurement of alcohol use is comparable to lab-based measurement (Sobell, Brown, Leo, & Sobell, 1996). Participants received email links to our online survey for each wave and were given weekly telephone reminders until: (a) the survey was completed, (b) the participant indicated refusal; or (c) three months passed since the original reminder. The average time between waves was 192.3 days (SD = 38.5). Participants who skipped a wave were invited to complete subsequent waves. Participants received $10 or 1 course credit point at wave one, $10 for wave two, and $15 each for waves three and four. Participants were compensated and debriefed in person or via mail.

2.4. Data analysis

Data were missing completely at random (MCAR) across all waves according to Little's (1988) MCAR test, $\chi^2(203) = 215.46$, $p > 0.10$. We used full information maximum likelihood (FIML) estimation for scale-level missing data and within-person mean imputation for item-level missing data. Correlations were computed using Mplus 7.0 (Muthén & Muthén, 2010) and interpreted using Cohen's (1992) guidelines (see Note in Table 1). Growth curve analyses were conducted using HLM 7.01 (Raudenbush, Bryk, & Congdon, 2004) with robust standard errors.

3. Results

Means, standard deviations, ranges, and bivariate correlations appear in Table 1. The average test-retest correlation across waves was 0.34 for frequency (r = 0.22–0.62), 0.62 for quantity (r = 0.53–0.66), and 0.65 for alcohol-related problems (r = 0.54–0.76). Table 1 also shows frequency and quantity were largely unrelated (r = −0.07–0.12). Alcohol-related problems were weakly to moderately correlated with frequency (r = 0.14–0.36) and moderately to strongly correlated with quantity (r = 0.29–0.56).

Growth curves analyzed the rate and the pattern of change in outcomes over time. For each individual, the three alcohol variables were modeled as a function of time with an intercept and a slope. The intercept indicates where participants began at wave one, and the slope indicates the within-person rate of change in the outcome. Growth curves included two levels: the first analyzed within-person changes over time for each individual and the second analyzed between-person variability in individual trajectories. Fixed-effects reflect average within-