HHS Public Access

Author manuscript

Subst Use Misuse. Author manuscript; available in PMC 2020 March 31.

Published in final edited form as:

Subst Use Misuse. 2018 November 10; 53(13): 2240–2249. doi:10.1080/10826084.2018.1467455.

Descriptive and prospective analysis of young adult alcohol use and romantic relationships: Disentangling between- and within-person associations using monthly assessments

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Abstract

Background: Prior research on romantic relationships and alcohol use among young adults has not distinguished between differences in patterns of relationship status over extended periods of time and within-person changes in status that only occur for some individuals.

Objectives: This study captured between-person differences in relationship patterns, assessed associations between relationship patterns and alcohol use, and examined within-person associations between alcohol use and relationship status changes. In addition, age and sex differences in between- and within-person associations were tested.

Methods: We used multilevel modeling of monthly data collected over one year on alcohol use and romantic relationship status from a Seattle area community sample of 620 young adults (ages 18–24).

Results: Participants were coded into six relationship pattern groups: (1) *single-not-dating* (16%), (2) *stable-in-a-relationship* (30%), (3) *single-dating* (10%), (4) *ended-a-relationship* (14%), (5) *started-a-relationship* (13%), and (6) *ended-and-started-a-relationship* (18%). *Single-not-dating* and *stable-in-a-relationship* groups reported the least drinking across the entire year; the *single-dating*, *ended-a-relationship*, and *ended-and-started-a-relationship* groups reported higher levels of drinking. Examining within-person changes in groups 3–6 revealed increases in drinking associated with months of dating among the *single-dating* group, months post-breakup among the *ended-a-relationship* group, and months of breaking up and starting a new relationship among the *ended-and-started-a-relationship* group. Few differences by age or sex were found for between- or within-person associations.

Conclusions: The findings point to heterogeneity in patterns of relationship status over time, differences in relationship patterns associated with variations in drinking, and particular time points of elevated risk for young adults who experience changes in status.

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The authors report no conflicts of interest.

Keywords

Alcohol; Young Adulthood; Romantic Relationships

Research on young adults has found protective effects of being in a committed romantic relationship on heavy and frequent drinking (Bachman, Wadsworth, O'Malley, Johnston, & Schulenberg, 1997; Crosnoe & Riegle-Crumb, 2007; Fischer & Wiersma, 2012; Fleming, White, & Catalano, 2010) and risk associated with relationship dissolution (Fleming, White, Oesterle, Haggerty, & Catalano, 2010; Larson & Sweeten, 2012; Salvatore, Kendler, & Dick, 2014). Some research also points to increased drinking associated with casual dating or the beginning of romantic relationships (Andersson, Johnsson, Berglund, & Ojehagen, 2007; Cooper & Orcutt, 1997; Salvatore, et al., 2014). Much of this research has used longitudinal data with lengthy intervals between time points (e.g., a year or two years), making it difficult to disentangle whether associations were linked to between-person differences in individuals' patterns of relationship status over time or relationship status changes themselves.

Despite changes in social roles in young adulthood (Arnett, 2004; Bachman, et al., 1997; Cohen, Kasen, Chen, Hartmark, & Gordon, 2003), some individuals are stable over extended periods of time with respect to romantic relationship status, either in long-term relationships or consistently single and not dating. Research suggests those in stable committed relationships drink less alcohol than those not in committed relationships (Fischer & Wiersma, 2012; Fleming, White, & Catalano, 2010; Staff, Greene, Maggs, & Schoon, 2014; Staff et al., 2010). Studies have rarely distinguished between those who are single and not dating from those who are single and going out on casual dates (see Salvatore et al., 2014 for an exception). The single-not-dating group might be characterized by more drinking, because they lack the protective effects of committed relationships (Fleming, White, & Catalano, 2010; Maume, Ousey, & Beaver, 2005); however, this group might include individuals who take fewer risks, including those linked to alcohol use, and have less exposure to drinking contexts, such as bars and parties (Fischer & Wiersma, 2012). Casual dating, on the other hand, may be associated with more risk taking and exposure to environments with greater alcohol access. In a study of college students, Salvatore and colleagues (2014) found individuals engaged in casual dating drank more than individuals who were single and not dating or were in committed relationships. Individuals who do experience changes in their romantic relationship status may have elevated alcohol use partly because these individuals are less risk averse and drink more as part of a constellation of risk-taking behaviors. This sort of selection effect may be salient particularly for individuals who experience multiple transitions within relatively short periods of time.

Individuals who experience changes in romantic relationship status, as well as those who are single and whose dating habits vary across time, provide an opportunity to study effects of changes in romantic relationships status on drinking. As noted above, periods of dating may be associated with more drinking because alcohol use accompanies this type of social interaction. Research has documented that breakups are associated with increases in alcohol use (Fleming, White, Oesterle, et al., 2010; Larson & Sweeten, 2012). According to the

transitions catalyst model (Schulenberg & Maggs, 2002), and similar to the potential effects of casual dating, individuals may use alcohol to help facilitate courtship and the transition to commitment; on the other hand, protective effects of committed relationships may depress alcohol use in the period after relationships are formed. Importantly, the effects of breakups and starting a new relationship may not be consistent across different types of individuals characterized by different relationship patterns. It may be that individuals characterized by frequent status changes are less sensitive to these changes, and individuals who experience only one status change may be more strongly affected by a breakup, for example, leading to greater increases in alcohol use.

The effects of romantic relationships on alcohol use may also differ by age and gender. Some research suggests that the protective effects of marriage with respect to alcohol use are particularly strong for younger adults (Temple, 1991). The effects that changes in romantic relationship status may have on alcohol use could also differ by age and gender. More generally, it may be that relationship stability has stronger associations with alcohol use early in young adulthood. Research on effects of marriage and divorce on alcohol use has generally found similar effects for men and women (Leonard and Rothbard, 1999), but some studies have found that gender may moderate protective effects of being in a committed relationship and risk associated with breakups (Fischer & Wiersma, 2012). For instance, Bachman et al. (1997) found greater reductions in drinking associated with marriage for young adult women compared to young adult men.

To further investigate the potential protective or deleterious effects of relationship status stability and instability, the current study analyzed monthly data on a young adult sample followed for 12 months. First, we examined heterogeneity in individuals' patterns of relationship status over time. Second, we examined differences in alcohol use between relationship pattern groups across the early adult developmental time period. We expected to see less drinking in individuals characterized by stability in relationships compared to those characterized by instability. Third, we investigated whether within-person changes in relationship status at the monthly level were associated with alcohol use for those groups that experience variability in status. We expected to see within-person increases in drinking associated with dating and both ending and starting relationships, although these associations may not be uniform across individuals who experience only one transition compared to those who experience multiple transitions. For both between- and within-person associations between romantic relationships and alcohol use, we tested whether associations differ by age and sex.

Methods

Sample and procedures

We used data from *Project Transitions*, a longitudinal investigation of social role transitions and alcohol use. Participants were recruited through a variety of methods such as online ads, tabling at community colleges and community events, and flyers posted at retail establishments. Eligible participants were 18–23 years old at screening, resided within the Seattle metropolitan area, had an email address, reported drinking alcohol at least once in the prior year, and were willing to come to our office for consent, identity/age verification,

and the baseline assessment. Participants were paid $40 for the baseline assessment. The baseline assessment included demographic questions, alcohol use history, and other questions to assess an array of psychosocial and behavioral characteristics. Participants then completed monthly web-based assessments for the next 24 months, for which they received email and text message invitations. The current study utilized monthly data from the first 12 months. Participants received $20 for each monthly assessment in the first year, with the 6 and 12 month assessments being longer such that participants received $30 and $40, respectively. Bonuses of $20 could be earned in months 1–6 and months 7–12 if all assessments in those time periods were completed. The University of Washington's Institutional Review Board approved all procedures.

Between January 2015 and January 2016, 778 individuals met eligibility criteria, came to study offices for consent and age verification, completed the baseline assessment, and started the monthly assessments. Of these 778 participants, 503 (64.7%) completed all 12 months of monthly data collection in their first year and 620 (79.6%) completed at least 10 months. These 620 with at least 10 months of data comprised the sample for the current study.

The sample is 59.3% White, 19.7% Asian or Pacific Islander American, 11.7% Mixed Race, 4.4% African American, 4.1% other, and 0.8% Native American. Additionally, 7.9% reported being Hispanic/Latino. Average age at baseline was 21.18 years (SD=1.72) and 60.0% reported sex at birth as female. Of those who reported female as their birth sex, two identified as male at time of enrollment, four as transgender, and two as transmale, and six did not provide their gender identity. With respect to sexual orientation, 77.1% reported being heterosexual. At baseline, 73.0% were enrolled in post-secondary education, including 19.4% in a two-year college, 46.7% in a four-year college or university, and 5.7% in a graduate or professional program; 45.5% were employed part time and 16.5% full time; and 39.2% lived with their parents. The analysis sample did not significantly differ from the 159 who completed less than 10 monthly assessments in the first year (and were thus excluded) with respect to age, educational or employment status, race, or sexual orientation. Compared to the excluded participants, those in the analysis sample were more likely to report sex at birth as female (60% vs. 39%, $X^2(1)=22.63$, $p<.001$) and less likely to be Hispanic/Latino (7.9% vs. 13.9%, $X^2(1)=5.41$, $p=.020$).

Measures

Alcohol use.—Frequency of *heavy episodic drinking* (HED) was based on response to the item: "During the past month, how often did you have 4/5 or more drinks containing any kind of alcohol within a two-hour period?" with 4 or 5 used as the threshold for females and males, respectively, and sex determined by sex at birth (National Institute of Alcohol Abuse and Alcoholism, 2013). We collapsed eight response options into four (1=never, 2=once, 3=2–3 days, 4=1 day per week or more). *Typical drinks per week* was based on the Daily Drinking Questionnaire (Collins, Parks, & Marlatt, 1985) that asked for typical number of drinks consumed in the prior month for each day of the week (response options range: 0–25 for each day). Answers to these items were summed to capture number of drinks in a typical week.

Relationship pattern groups.—At each month, participants were asked to report their current romantic relationship status and whether they had experienced a variety of possible changes in status in the prior month. Status included “Single (not dating)”; “Dating Casually (not committed to one partner)”; “Dating Seriously (have a boyfriend/girlfriend)”; “Engaged”; “Married/Committed Partners (including same-sex domestic partnership)”; and “Separated/Divorced.” Relationship changes included “Relationship ended, became single”; “Became separated/divorced”; “Decided to separate or be on a break”; “Started new relationship”; and “Decided to exclusively date one partner.” Based on reported relationship status and change each month, participants were coded each month for whether they (1) were in a committed relationship; (2) ended a relationship; (3) started a new relationship; and (4) were casually dating, but not in a committed relationship. We then categorized participants into six groups defined *a priori* to capture heterogeneity in stability and change in romantic relationships patterns. These groups were: (1) ***single-not-dating*** (single and not dating during the year); (2) ***stable-in-a-relationship*** (in a committed relationship for the entire year); (3) ***single-dating*** (single during the year but casually dating in at least one month); (4) ***ended-a-relationship*** (started the study in a relationship that ended during the year); (5) ***started-a-relationship*** (began the study single and started a new committed relationship); and (6) ***ended-and-started-a-relationship*** (both ended and started one or more committed relationship). Coding of cases with one or two months of missing data drew upon information respondents who were in a relationship provided about the length of those relationships, thus allowing for informed guesses about months with missing data. A small number of cases (<10) not captured by our initial sorting rules due to contradictory information across or within months required inspection of all monthly relationship data in order to be assigned to the most likely groups.

Sociodemographic covariates.—*Sex* was assessed as biological sex at birth, which was used to determine the cutoff for HED. Other binary variables included whether or not participants were *female, heterosexual*, *White*, *Hispanic/Latino*, and *lived with their parents*. *Educational status* at baseline assessment was categorized as (1) not enrolled in a post-secondary school, (2) enrolled in a two-year college, or (3) enrolled in a four-year college or university or in a graduate/professional program. *Employment status* at baseline was categorized as (1) not employed, (2) employed part time, and (3) employed full time.

Analysis

We estimated multilevel growth models to assess alcohol use across ages 18 to 24 (age 24 time points provided by participants enrolled when age 23) using HLM 6.08 (Raudenbush, Bryk, Cheong, & Congdon, 2004). In models with HED as an outcome, an ordinal logistic (also known as cumulative probability) form of the multilevel model was used. For typical drinks per week, which was a non-negative discrete integer showing positive skew, we used an over-dispersed Poisson model. Linear and quadratic age terms were entered as Level 1 predictors of growth, with age based on age at month of the survey, coded in one month intervals and units of years. Age was also centered at age 21 so that the coding ranged from −3.00 to 3.92 (e.g., 3.92 = age 24 and 11 months). With this coding of age, estimates for intercepts reflect expected values at age 21, and estimates for the age effect represent yearly rate of change as of age 21. The quadratic age-squared effect captures acceleration or

deceleration in rates of change. This specification was based on a prior research showing that heavy drinking in general population increases until approximately age 23 and then begins to decease (Johnston, O'Malley, Bachman, & Schulenberg, 2016).

For the sample of 620, initial models estimated average trajectories for the sample and between-individual variability in level and change without any additional covariates. Relationship patterns and sociodemographic covariates were then added as predictors of alcohol outcomes. Relationship pattern group, a Level 2 time-fixed variable, was dummy coded with single-not-dating as the reference group. Educational and employment status were also dummy coded with "not in college" and "not employed" used as the reference categories, respectively. Random intercept and random slopes for age terms were specified. Intercept and age slopes were conditioned on relationship group membership and sociodemographic covariates. Secondary models were run that included interaction terms to test whether sex moderated associations between relationship pattern groups and alcohol use.

To investigate within-person effects, we ran separate models for the four subgroups that experienced variability in casual dating or ending and starting relationships. For these models, sex was the only sociodemographic variable included as a Level 2 predictor, and random effects were not included for age slopes because the focus was on time-varying relationship variables. Furthermore, variance for most of the linear and quadratic effects of age were nonsignificant ($p>.05$), possibly due to the smaller sample sizes of the subgroups. In these subgroup models, casual dating, ending and starting relationships, and whether individuals were out of a relationship in a given month were added as Level 1 time-varying predictors. For the *single-dating* group, proportion of months reporting casual dating was included as a Level 2 variable, and casual dating was a Level 1 predictor mean centered within individuals. Similarly, for analyses involving the three groups that experienced a relationship status change, proportion of months out of a relationship was included as a Level 2 variable and the time-varying measure of being out of a relationship in a given month was centered within individuals. Where there was evidence of between-person variation in effects of within-person variables, sex and age were tested as moderators of these effects.

For both the ordinal and Poisson multilevel growth models, we report the subject-specific fixed effect estimates. These estimates are interpreted as measures of association conditional on all other variables and random effects in the models being equal (Raudenbush & Bryk, 2002).

Results

Heterogeneity in relationship patterns

Of the analysis sample, 97 (15.6%) were *single-not-dating*, 183 (29.5%) were *stable-in-a-relationship*, 59 (9.5%) were *single-dating*, 86 (13.9%) *ended-a-relationship*, 83 (13.4%) *started-a-relationship*, and 112 (18.1%) *ended-and-started-a-relationship*. Table 1 shows differences in sociodemographic variables by group. The distribution across groups differed by sex, with a higher proportion of males in the *single-not-dating* group and a higher

proportion of females in the *ended-and-started-a-relationship* group. Compared to the three groups that either ended or started relationships, a larger proportion of the *single-dating* group was heterosexual. The *single-not-dating* group had the lowest proportion of White participants. Compared to other groups, a lower proportion of the *stable-in-a-relationship* group lived with their parents, possibly because many were living with their partners. A smaller small proportion of the *single-not-dating* and *started a relationship* groups worked part time. The *stable-in-a-relationship* group had the highest average age; the *started-a-new-relationship* group had the lowest.

Differences in drinking by relationship pattern

Across 6,713 monthly reports from 620 participants, HED was reported 0 times in 58.1% of reports, on one day in the past month in 15.9%, on 2–3 days in 12.8%, and on 1 day per week or more in 13.1%. Based on all monthly reports, the mean for typical drinks per week was 4.82 (*SD*=7.34) and the median was 2.

As shown in Table 2, the first model of growth in HED indicated nonsignificant linear change at age 21; however, an age-squared effect indicated a downward curve, HED increasing at earlier ages, peaking at about age 23, and decreasing thereafter. Typical drinks per week had a positive rate of increase at age 21 and a negative age-squared effect. The average trajectory for typical drinks per week peaked between ages 22 and 23. For both measures of alcohol use, variance of random effects for intercept, age, and age-squared were statistically significant pointing to between-person variability in level, rate of change, and acceleration/deceleration. Initial models, however, indicated few statistically significant relationship pattern group differences in yearly change or acceleration/deceleration. The only significant interactions with age or age-squared were for *single-dating* and *stable-in-a-relationship* compared to *single-not-dating* in typical drinks per week. These interactions indicated the rate of increase in drinks per week was less for both *single-dating* and *stable-in-a-relationship* compared to *single-not-dating* at age 21, but that rates of change for these two groups converged at the higher and lower ends of the age distribution. To make interpretation of model estimates more straightforward, Table 2 presents results of models in which relationship group and sex interaction effects with age and age squared were omitted.

Models for the two alcohol outcomes showed a consistent pattern of results with respect to relationship pattern group effects on intercepts. For both measures, alcohol use was lowest for *single-not-dating*, followed by *stable-in-a-relationship.* The *started-a-relationship* group was the next lowest and did not differ significantly from the *single-not-dating* group for either drinking measure. The *ended-a-relationship*, *single-dating,* and *ended-and-started-a-relationship* groups reported more drinking, and all had significantly higher levels of drinking than the *single-not-dating* group. The odds and count ratios show relationship group differences were considerable. For example, ending and starting a relationship instead of being single and not dating made an individual's odds of more frequent HED in a given month 3.82 greater and was also associated with two and a half times as many drinks per week. Estimates from a logistic model predicting *any* HED indicated that at the mean values of sociodemographic covariates the expected prevalence of past-month HED at age 23 was 25.9% for *single-not-dating* and 55.0% for *ended-and-started-a-relationship* groups.

Females drank less with respect to both alcohol measures. In secondary models, none of five sex-by-relationship-pattern-group interaction terms predicting intercepts of alcohol use were statistically significant for either alcohol measure. Further, models run separately for males and females indicated the rank order of relationship groups in terms of both measures was similar across sex.

Within-person associations

Results of models estimated for the four groups that experienced month-to-month changes in relationships are shown in Tables 3–6. The results show evidence for within-person changes in relationship status being associated with alcohol use, although the relationship change effects were not consistent across subgroups.

For the *single-dating* group, months of casual dating were associated with more alcohol use, although this association was only statistically significant for typical drinks per week (see Table 3). Individuals in this group had 25% more drinks per week in a dating month compared to a non-dating month.

For the *ended-a-relationship* group, the month in which the breakup occurred had little association with alcohol use; however, individuals in this group reported more drinking in the post-breakup months than the pre-breakup months (Table 4). Post-breakup months compared to pre-breakup months were associated with 3.5 times greater odds of HED and 34% more typical drinks per week.

For the *started-a-relationship* group, neither starting a relationship nor months out of a relationship (in this case, the months prior to starting a relationship) were significantly associated with either measure of alcohol use (Table 5). Among the *ended-and-started-a-relationship* group, however, starting a relationship was associated with more frequent HED and more typical drinks per week (59% greater odds of more frequent HED and 14% more drinks per week; Table 6). For this group, the month of ending a relationship was also associated with more drinking, with months of breakup associated with 17% more drinks per week. Also for this group, more drinking, as indicated by both measures of alcohol use, was reported in months out of a relationship than months in a relationship, although this difference was not statistically significant.

Additional models testing sex and age interactions for within-person effects of starting, ending, or being out of a relationship revealed little evidence of moderation. Sex and age interaction terms were added for all within-person effects that had random effects with statistically significant variance. Of the 10 interaction terms tested, none were statistically significant.

Discussion

Our study found alcohol use to vary by *types* of individuals, defined by their relationship patterns over time, and also by month-to-month relationship-related events. Individuals characterized by stability in their relationship status drank less alcohol; those who dated casually or reported changes in status within a one year period drank more. Month-to-month

variation in casual dating, starting and ending relationships, and being in or out of a relationship were related to month-to-month variation in drinking, although the effects of starting and ending a relationship were not uniform across individuals who experienced only one relationship status change versus those who experienced multiple changes.

Over 45% of the sample was either single and not dating or in a stable relationship for the entire year. These individuals reported the lowest levels of heavy drinking and drinks consumed per week. The finding that the *single-not-dating* group reported even less drinking than the *stable-in-a-relationship* group suggests the salient factor may be stability rather than whether a young adult has a steady partner. Single individuals who were and were not dating differed considerably. The casual dating group (10% of the sample) reported the second highest levels of drinking among the six groups identified, corroborating a study with a college sample (Salvatore et al., 2014). Individuals in the casual dating group also consumed more drinks per week in dating months than in non-dating months. This finding aligns with social drinking being a catalyst for casual dating (Schulenberg & Maggs, 2002).

Young adults who only started a new relationship (13% of the sample) drank the least among the four groups characterized by month-to-month variability in romantic relationships. For this group, month-to-month alcohol use was not strongly related to the first month of the relationship, nor pre-post relationship status, suggesting that while this group experienced change, it may have been a transition into a stable relationship for many.

The 14% of the sample who experienced only a breakup displayed a pattern similar to that found in prior research on relationship dissolution and drinking (Fleming, White, Oesterle, et al., 2010; Larson & Sweeten, 2012). On average this group drank more than the stable groups or young adults who only started a new relationship. Also, for this group, months post-breakup were characterized by more alcohol use compared to pre-breakup months, a pattern perhaps related to coping with heartache or spending more time socializing with friends (Bachman et al., 2002; Fleming, White, Oesterle, et al., 2010). Our study provides information on timing: the increase in drinking was not concurrent with or immediately after the breakup, but was evident in subsequent months.

Those who both started and ended a relationship (18% of the sample) drank more than any other group. Their drinking also spiked in months in which relationships started and ended. These findings point to relationship turmoil, both as a defining characteristic of types of young adults and as something that varies within these individuals, being associated with heightened and immediate risk for heavy and frequent drinking. Although we chose not to add to the complexity of our models and did not formally test for interactions, the fact that significance and strength of effects of starting a new relationship and the timing of effects for ending a relationship were different for this group compared to the groups who only started or ended a relationship suggests differential effects of transition by between-person relationship pattern characteristics.

Our results yielded minimal evidence of moderation by age or sex. Although alcohol use increased from age 18 up to between ages 22 or 23 and then decreased slightly thereafter, neither associations between relationship status groups and alcohol use, nor associations

between month-to-month variation in romantic relationships and alcohol use, varied with age in a clear pattern. The data for testing age differences was limited, however, since the number of individuals represented at any particular age was about 120, and smaller for the relationship pattern subgroups. Also, overlapping cohorts ranged from age 18 to 23 at the beginning of the study; thus, cohort effects may have added noise to our data.

The distribution of the relationship pattern groups differed by sex, with more females than males in the less stable groups, and females reported less alcohol use on average. Although some studies have found gender differences in relationship effects on drinking (Fischer & Wiersma, 2012), interactions tested between sex and relationship variables were nonsignificant in our study. Lack of power may be an issue, particularly for subgroup analyses that tested within-person effects. Relying on *p*-values to organize our findings is a limitation, and we caution against a strong inference of consistency across sex and age based on lack of statistical significance. Also, we used a measure of sex at birth although a number of young adults were not cisgender.

Our analyses do not weigh evidence for selection versus socialization effects with respect to relationship status pattern groups. Also, when looking at month-to-month variation in dating or status changes and drinking, temporal ordering within the month is unknown. In examining differences in alcohol use among between-relationship-pattern groups, we did adjust for some sociodemographic variables, treating these variables as fixed individual-level characteristics. Some possible confounders, particularly variables such as residential, educational, and employment status, also vary within individuals and may interact with effects of relationship status. Due to the complexity of controlling for within-individual variability in other lifecourse variables and the small sample sizes for our relationship pattern subgroup analyses, we chose not to include all possible time-varying covariates within models assessing within-person effects of variability in relationships. These issues limit inferences that relationship patterns or within-person changes in relationships *cause* levels or changes in alcohol use. In addition, we did not include tests for potentially mediating variables, such as stress or a desire facilitate new relationships with alcohol, through which effects of relationships on alcohol may occur. Finally, generalizability of our findings may be limited due to use of from a single metropolitan area with an eligibility requirement of alcohol use in the year prior to enrollment.

The findings do pinpoint groups of individuals at heightened risk for problem drinking. In particular, young adults whose patterns of relationships are characterized by less stability may be at most risk. For those who experience instability, the findings point to particular periods of risk, specifically, in the months following breakups and in months of casual dating and, among those who experience frequent and shorter-term relationships, those months in which relationships begin or end. Specific and strong implications for prevention of alcohol misuse are limited because it is difficult to identify an individual's potential for experiencing stability or instability in romantic relationships before that pattern is revealed. However, the findings do point to the importance of future research on alcohol misuse in early adulthood taking into account both between- and within-person variability in social contexts.

Acknowledgments

The project described was supported by National Institute on Alcohol Abuse and Alcoholism grant R01AA022087 to Dr. Lee. The content of this manuscript is solely the responsibility of the author(s) and does not necessarily represent the official views of the National Institute on Alcohol Abuse and Alcoholism or the National Institutes of Health.

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TABLE 1.

Sociodemographic variables by relationship pattern group (n=620)

Variable	Single-not-dating (n=97) n (%)	Stable-in-a-relationship (n=183) n (%)	Single-dating (n=59) n (%)	Ended-relationship (n=86) n (%)	Started-relationship (n=83 n (%)	Ended-and-started-relationship (n=112) n (%)	X^2 (df)
Female	42 (43.3)	114 (62.3)	33 (55.9%)	53 (61.6)	49 (59.0)	81 (72.3)	**19.29 (5)**
Heterosexual	79 (81.4)	148 (80.9)	51 (86.4)	63 (73.3)	59 (71.1)	77 (68.8)	**12.20 (5)**
White	39 (40.2)	115 (62.8)	32 (54.2)	52 (60.5)	48 (57.8)	79 (70.5)	**22.09 (5)**
Hispanic/Latino	8 (8.2)	10 (5.5)	7 (11.9)	9 (10.5)	6 (7.2)	9 (8.0)	3.61 (5)
Live with parents	47 (48.5)	54 (29.5)	28 (47.5)	38 (44.2)	33 (39.8)	43 (38.4)	**13.23 (5)**
Educational status							13.32 (10)
Not in college	26 (26.8)	67 (36.6)	16 (27.1)	22 (25.6)	21 (25.3)	24 (21.4)	
2-year college	21 (21.6)	33 (18.0)	8 (13.6)	19 (22.1)	13 (15.7)	26 (23.2)	
4-year college +	50 (51.5)	83 (45.4)	35 (59.3)	45 (52.3)	49 (59.0)	62 (55.4)	
Employment							**26.41 (10)**
Not employed	54 (55.7)	64 (35.0)	19 (32.2)	29 (33.7)	40 (48.2)	43 (38.4)	
Part time	31 (32.0)	85 (46.4)	33 (55.9)	44 (51.2)	30 (36.1)	59 (52.7)	
Full time	15 (15.5)	39 (21.3)	8 (13.6)	15 (17.4)	14 (16.9)	11 (9.8)	
	M (SD)	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**M (SD)**	**F (df)**
Age	21.30 (1.86)	21.52 (1.65)	20.96 (1.57)	21.18 (1.65)	20.83 (1.74)	20.90 (1.76)	**3.00 (5)**

Bold typeface indicates significant at p<.05.

TABLE 2.

Growth models for alcohol use for analysis sample (n=620)

	HED frequency				Typical drinks per week			
	Unconditional		Conditional		Unconditional		Conditional	
Fixed effects	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**ACR**	**(95% CI)**	**ACR**	**(95% CI)**
Intercept (level at age 21)	**.06**	**(0.04,0.07)**	**0.03**	(0.02,0.04)	**2.81**	**(2.46,3.21)**	**1.76**	**(1.27,2.46)**
Female			**0.68**	(0.47,0.99)			**0.63**	**(0.51,0.79)**
Relationship pattern group								
Single-not-dating (reference)			--				--	
Stable-in-a-relationship			1.37	(0.79,2.37)			1.33	(0.91,1.94)
Single-dating			**3.03**	**(1.49,6.19)**			**1.79**	**(1.15,2.78)**
Ended-relationship			**2.80**	**(1.46,5.37)**			**1.85**	**(1.20,2.86)**
Started-relationship			**2.02**	**(1.03,3.96)**			1.47	(0.94,2.29)
Ended-and-started-relationship			**3.82**	**(2.06,7.06)**			**2.57**	**(1.75,3.77)**
Heterosexual			1.42	(0.92,2.20)			1.19	(0.91,1.55)
White			**1.73**	**(1.22,2.46)**			**1.30**	**(1.04,1.62)**
Hispanic/Latino			1.47	(0.81,2.67)			1.16	(0.79,1.71)
Lived with parents			0.93	(0.65,1.34)			0.87	(0.69,1.09)
School status								
Not in school			--				--	
2-year college			0.59	(0.34,1.01)			0.79	(0.56,1.14)
4-year college +			**1.86**	**(1.18,2.94)**			1.23	(0.94,1.61)
Employment status								
Not working			--				--	
Working part-time			1.87	(0.82,1.73)			1.10	(0.88,1.38)
Working full-time			1.24	(0.64,1.98)			1.27	(0.92,1.74)
Age (rate of change at age 21)	1.06	(0.95,1.19)	1.08	(0.97,1.21)	**1.18**	**(1.09,1.28)**	**1.17**	**(1.08,1.27)**
Age squared (acceleration in rate of change)	**0.94**	**(0.89,0.99)**	0.95	(0.90,1.00)	**0.92**	**(0.89,0.94)**	**0.92**	**(0.89,0.95)**
Random effects	**var.**	**p=**	**var.**	**p=**	**var.**	**p=**	**var.**	**p=**
Intercept	4.86	<.001	4.30	<.001	1.85	<.001	1.64	<.001
Age	0.96	.004	0.91	0.003	0.55	<.001	0.52	<.001

	HED frequency				Typical drinks per week			
	Unconditional		Conditional		Unconditional		Conditional	
Fixed effects	**AOR**	**(95% CI)**	**AOR**	**(95% CI)**	**ACR**	**(95% CI)**	**ACR**	**(95% CI)**
Age squared	0.11	.007	0.12	0.005	0.04	<.001	0.04	<.001
Level 1 residual	---	---	---	----	2.02		2.03	

Fixed effects estimates significant at p<.05 in bold. HED=heavy episodic drinking, *AOR*=adjusted odds ratio, *ACR*=count ratio, *var*=variance component.

TABLE 3.

Growth models of alcohol use for *single-dating* group (n=59)

	HED frequency		Typical drinks per week	
Fixed effects	**AOR**	**(95% CI)**	**ACR**	**(95% CI)**
Intercept (level at age 21)	**0.09**	**(0.04,0.20)**	**3.40**	**(2.44,4.74)**
Female	0.67	(0.19,2.41)	**0.50**	**(0.26,0.97)**
Proportion of months casual dating	1.68	(0.20,14.23)	1.06	(0.33,3.40)
Casual dating month	1.31	(0.79,2.16)	**1.25**	**(1.07,1.45)**
Age (rate of change at age 21)	0.88	(0.67,1.15)	0.89	(0.73,1.08)
Age squared (acceleration in rate of change)	0.97	(0.86,1.10)	1.00	(0.94,1.07)
Random effects	**var.**	**p=**	**var.**	**p=**
Intercept	4.75	<.001	1.26	<.001
Casual dating month	0.54	.306	0.08	.083
Level 1 residual			2.09	

Fixed effects estimates significant at p<.05 in bold. HED=heavy episodic drinking, *AOR*=adjusted odds ratio, *ACR*=adjusted count ratio, *var.*=variance component

TABLE 4.

Growth models of alcohol use for *ended-relationship* group (n=86)

	HED frequency		Typical drinks per week	
Fixed effects	**AOR**	**(95% CI)**	**ACR**	**(95% CI)**
Intercept (level at age 21)	**0.07**	**(0.03,0.13)**	**3.02**	**(2.19,4.16)**
Female	0.91	(0.31,2.70)	0.80	(0.45,1.39)
Proportion of months not in relationship	1.20	(0.36,3.96)	1.31	(0.70,2.46)
Month out of relationship	**3.56**	**(1.89,6.72)**	**1.34**	**(1.04,1.73)**
Month in which relationship ended	1.07	(0.70,1.65)	0.86	(0.71,1.05)
Age (rate of change at age 21)	0.99	(0.73,1.36)	1.17	(0.93,1.47)
Age squared (acceleration in rate of change)	0.98	(0.83,1.15)	0.95	(0.88,1.03)
Random effects	**var.**	**p=**	**var.**	**p=**
Intercept	3.83	<.001	1.57	<.001
Month out of relationship	1.26	.103	0.44	.000
Month in which relationship ended	0.13	>.500	0.21	.008
Level 1 residual			2.49	

Fixed effects estimates significant at p<.05 in bold. HED=heavy episodic drinking, *AOR*=adjusted odds ratio, *ACR*=adjusted count ratio, *var.*=variance component

TABLE 5.

Growth models of alcohol use for *started-relationship* group (n=83)

	HED frequency		Typical drinks per week	
Fixed effects	**AOR**	**(95% CI)**	**ACR**	**(95% CI)**
Intercept (level at age 21)	**0.06**	**(0.03,0.14)**	**2.67**	**(1.71,4.15)**
Female	0.55	(0.20,1.54)	0.62	(0.33,1.18)
Proportion of months not in relationship	1.05	(0.23,4.75)	0.69	(0.28,1.75)
Month out of relationship	0.85	(0.48,1.51)	1.02	(0.78,1.34)
Month in which relationship started	1.25	(0.77,2.05)	0.96	(0.83,1.11)
Age (rate of change at age 21)	1.25	(0.90,1.74)	1.15	(0.92,1.42)
Age squared (acceleration in rate of change)	0.90	(0.76,1.05)	0.92	(0.84,1.02)
Random effects	**var.**	**p=**	**var.**	**p=**
Intercept	4.07	<.001	1.67	<.001
Month out of relationship	1.80	.043	0.46	.002
Month in which relationship started	0.40	>.500	0.01	>.500
Level 1 residual			2.53	

Fixed effects estimates significant at p<.05 in bold. HED=heavy episodic drinking, *AOR*=adjusted odds ratio, *ACR*= adjusted count ratio, *var.*=variance component

TABLE 6.

Growth models of alcohol use for *ended-and-started-relationship* group (n=112)

	HED frequency		Typical drinks per week	
Fixed effects	**AOR**	**(95% CI)**	**ACR**	**(95% CI)**
Intercept (level at age 21)	**0.09**	**(0.05,0.16)**	**3.98**	**(3.15,5.04)**
Female	1.25	(0.46,3.39)	0.69	(0.45,1.08)
Proportion of months not in relationship	1.14	(0.36,3.64)	0.94	(0.52,1.70)
Month out of a relationship	1.15	(0.79,1.66)	1.12	(0.96,1.30)
Month in which relationship ended	1.24	(0.90,1.71)	**1.17**	**(1.04,1.32)**
Month in which relationship started	**1.59**	**(1.14,2.23)**	**1.14**	**(1.01,1.28)**
Age (rate of change at age 21)	1.12	(0.87,1.43)	1.07	(0.93,1.24)
Age squared (acceleration in rate of change)	0.97	(0.87,1.09)	1.07	(0.92,1.01)
Random effects	**var.**	**p=**	**var.**	**p=**
Intercept	4.16	<.001	1.12	<.001
Month out of relationship	0.65	>.500	0.21	<.001
Month in which relationship ended	0.16	>.500	0.05	.388
Month in which relationship started	0.10	>.500	0.05	.100
Level 1 residual			2.26	

Fixed effects estimates significant at p<.05 in bold. HED=heavy episodic drinking, *AOR*=adjusted odds ratio, *ACR*= adjusted count ratio, *var.*=variance component