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Where you live matters: The roles of living arrangement and self-esteem on college students' hazardous drinking behaviors

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This study examined the influence of living arrangements and self-esteem on problematic alcohol use among 139 university students. Our findings replicate the well-established inverse association between self-esteem and problematic alcohol use. However, analyses disaggregated by living arrangement revealed that this association was inconsistent such that the inverse association between self-esteem and both binge drinking and alcohol-related problems was observed among participants living with parents, but not among students living on campus or off campus without parents. The moderating effect of living arrangement highlights the importance of considering living arrangements when examining risk factors for hazardous drinking among college students, as the pathways to problematic alcohol use may differ according to living situations.

Keywords: *College students, drinking behaviors, risk factors*

INTRODUCTION

Binge drinking among college students is associated with many risks including accidental injury, interpersonal violence, and low school achievement (Wechsler, Lee, Nelson, & Kuo, 2002). Evidence suggests that university students are at high risk for binge drinking, as young adulthood is the period of life when substance use disorders are at peak prevalence (Patock-Peckham & Morgan-Lopez, 2009). Indeed, it is estimated that the total annual cost of alcohol-associated emergency department visits alone is around \$ 500,000 per university (Mundt & Zakletsia, 2012). Due to these substantial negative consequences, problematic use of alcohol among college students has been widely

studied, and diverse attempts have been made to identify factors that contribute to alcohol use and alcohol-related problems among this population. Indeed, the identification of risk factors is essential for designing effective interventions to reduce and prevent high-risk drinking. To this end, this study examined the independent and combined influences of self-esteem and living arrangements on alcohol use and alcohol-related problems.

Numerous studies have identified predictive relationships between problematic alcohol use, individual differences such as self-esteem (Buri, Louiselle, Misukanis, & Mueller, 1988; Schuckit & Smith, 2006), and demographic variables such as living arrangements (Gfroerer, Greenblatt, & Wright, 1997; Newcomb & Bentler, 1987; Ward & Gryczynski, 2009). Moreover, direct relationships between personality factors and drinking behaviors (Buri et al., 1988; Schuckit & Smith, 2006), and living arrangements and drinking behaviors have been supported by previous research (Gfroerer et al., 1997; Hardford, Wechsler, & Muhen, 2002; Newcomb & Bentler, 1987; Ward & Gryczynski, 2009). However, to our knowledge, no previous research has examined the extent to which the predictive value of self-esteem for alcohol use varies according to different living arrangements.

Self-esteem refers to the global, subjective evaluations one makes about the quality of their behavioral traits (Glindemann, Geller, & Fortnery, 1999). High self-esteem is indicative of a sense of self-respect and self-worth; whereas low self-esteem indicates self-rejection and self-dissatisfaction (Rosenberg, 1965). Low self-esteem has been implicated as a risk factor for hazardous drinking behaviors among college students (Corbin, McNair, & Carter, 1996; Glindemann et al., 1999; Walitzer & Sher, 1996) and various explanations have been provided to explain this association. Specifically, individuals with low self-esteem have

been found to consume alcohol to regulate affect, gain social approval or avoid social rejection, and to maintain or enhance one's self-esteem (Neighbors, Larimer, Geisner, & Knee, 2004). It has also been proposed that people with low self-esteem may consume more alcohol to rationalize putatively poor performance (Seeman & Seeman, 1992) or to cope with anxiety and stress (Pullen, 1994).

The literature on alcohol use among college populations typically categorizes living arrangements into three groups: *on campus*, *with parents*, and *off campus without parents* (O'Hare, 1990; Presley, Meilman, & Cashin, 1996; Wechsler, Lee, Gledhill-Hoyt, & Nelson, 2001; Wechsler et al., 2002). Studies examining differences in alcohol consumption across various living arrangements generally report a consistent pattern of results, such that college students living with parents generally report the lowest levels of drinking (Gfroerer et al., 1997), whereas students living on campus report the highest levels of drinking (Presley et al., 1996; O'Hare, 1990; Wechsler et al., 2001). Furthermore, students living on campus tend to experience more negative consequences of alcohol use, including police contact and interpersonal difficulties (Ward & Gryczynski, 2009). A study examining alcohol consumption patterns of college students highlights the association between living arrangement and alcohol use; students living on campus decrease alcohol use when returning home for vacation to a level that is comparable with students living off campus, and resume higher levels of alcohol use upon returning to residence on campus (Basten & Kavanagh, 1996). However, it is notable that particularly heavy drinking may also occur during holidays when off-campus students may return home (Del Boca, Darkes, Greenbaum, & Goldman, 2004; Goldman, Greenbaum, Darkes, Brandon, & Del Boca, 2011).

Several studies provide insight into the factors that may underlie the association between alcohol use and living arrangements. A longitudinal study of substance use from grades 11 and 12 to 3–4 years after completion of high school reported that living arrangements were a significant contributor to increased alcohol use over the course of the study such that living on campus was associated with more alcohol use. The authors suggest that this may be due to changes in role socialization; new social environments such as moving away from parents to peer roommates can exert pressure to conform to new values, resulting in increased substance use (Newcomb & Bentler, 1987). Another explanation involves covariance between living arrangement and differences in parental control and availability of substances (Gfroerer et al., 1997; Wechsler et al., 2002); students living at home, are subject to greater parental control over activities and access to alcohol, whereas on campus, direct parental control is limited and the influence of peers tends to be relatively more pronounced on drinking behaviors (Valliant & Scanlan, 1996). Furthermore,

alcohol tends to be more accessible to those on campuses compared to those who live with parents (Wechsler et al., 2002).

Self-esteem and living arrangement have both been found to be important predictors of alcohol use in college populations; however, to our knowledge, no previous research has examined the combined influence of the factors on alcohol use. More generally, the relatively few studies that have examined the combined influence of living arrangement and personality factors report mixed findings. A study examining the influence of personality, living arrangement, and alcohol consumption among first-year university students reported higher levels of self-esteem among students living off campus and higher levels of depression among students living with parents. Moreover, students living off campus consumed more alcohol and were at greater risk for alcohol addiction followed by students living in residence and students living with parents (Valliant & Scanlan, 1996). On the other hand, a study examining the impact of living arrangements on factors such as self-esteem among college students found no relationship at all; however, the author noted that the effects of living arrangement are complex and warrant further examination (Baird, 1969).

In light of the robust literature identifying the association between both self-esteem and living arrangements on hazardous college drinking, the concurrent examination of both factors has the potential to further elucidate this important issue. Indeed, given the proposal that self-esteem influences drinking behavior by increasing susceptibility to peer influence (Zimmerman, Copeland, Shope, & Dielman, 1996), it is reasonable to propose that the effects of self-esteem may be at least partially reliant on living arrangement. Specifically, self-esteem may be more strongly associated with hazardous alcohol use among students living on campus who experience greater peer influence (Borsari & Carey, 2009). Alternatively, the effects of self-esteem may be accentuated among those who live at home, as the higher levels of negative affect associated with students who live at home (Bozick, 2007) may potentiate the influence of lower self-esteem. However, little research has examined whether the predictive value of self-esteem differs across different living arrangements, and therefore the relative merit of these competing hypotheses remains undetermined.

This study examines the consistency of the association between self-esteem and hazardous drinking across different living arrangements. Our primary interest lies in the comparison of those who live with parents versus those who live on campus, as it is these groups that have been the subject of most previous research addressing living arrangements and alcohol use. However, in order to more comprehensively examine the range of living arrangements we conducted exploratory analyses including students who lived off-campus but not with parents. The elucidation

of the influence of living arrangements on the association between hazardous drinking and self-esteem has the potential to inform the interpretation of previous findings regarding the association between self-esteem and alcohol use among college students. By examining the generalizability of effects across living arrangements our findings might also inform the development of targeted interventions aimed at distinct subgroups of college students based on living arrangement.

METHOD

Participants

Participants were 139 university students recruited over three consecutive semesters. Recruitment for the study was done through SONA systems and participants received credit for their involvement in the study. Of the 139 participants, 37% were male and ages ranged from 17 to 35 years ($M = 19.78$, $SD = 2.27$). Eighty-four percent of participants were Caucasian, with the remaining participants self-classified as Asian (8%), Indigenous or Aboriginal (2%), African American (2%), and other (4%). There were 28% living with parent, 37% living off campus, and 35% living on campus.

Measures

Self-esteem

The Rosenberg Self-Esteem Scale is a 10-item self-report questionnaire using a 4-point Likert scale (0 = strongly agree; 3 = strongly disagree) with higher scores indicating higher levels of self-esteem (Rosenberg, 1965). Previous studies have reported α reliabilities ranging from 0.72 to 0.88 (Gray-Little, Williams, & Hancock, 1997). Reliability analyses were run in this study to ensure similar values and the results revealed a Cronbach's α of 0.89.

Alcohol-related problems

The Rutgers Alcohol Problem Index (RAPI) (White & Labouvie, 1989) is a 23-item measure designed to assess problems associated with alcohol use. Items include descriptions of problems that may be associated with alcohol use (i.e. unable to do your homework or study for a test or tried to cut down or quit drinking) and participants were asked to rate the past year frequency of each problem on a 4-point scale (0 = never; 3 = more than five times).

Drinking

A Timeline Followback calendar (Sobell & Sobell, 1992) was used to obtain retrospective reports of daily alcohol consumption within the last year. Participants were asked how often in the last 12 months had they consumed alcohol and how much alcohol they consumed on each occasion. Each day was considered a separate variable; days were coded as dichotomous variables in terms of whether or not any drinking occurred and whether or not binge drinking occurred.

A drink is defined as a 12 oz can or bottle of beer, 5 oz glass of wine, or a drink with one 1.5 oz shot of liquor or spirits. A drinking day was considered any day that the participant consumed one or more alcoholic beverage and binge drinking was defined as four or more drinks for females and five or more drinks for males in a 2-h period. The number of drinking days and binge drinking days were then added up and an average was computed for each living arrangement group. This approach represents a valid and reliable alternative to quantity frequency measures (Collins, Kashdan, Koutsky, Morsheimer, & Vetter, 2008) and has been recommended by the National Institute on Alcohol Abuse and Alcoholism (NIAAA, n.d.).

Procedure

Participants completed an online survey consisting of the demographics form, the Rosenberg Self-esteem scale, and the RAPI. Following the completion of the online survey, participants were then invited to complete the in-person interview. The second portion of the study consisted of a semi-structured interview in which participants completed a Timeline Followback calendar. The interview took ~45 min to complete, during which time participants were asked about their alcohol consumption during the past 12 months. Memory recall aids were used (i.e. discrete events and anchor points) to help participants recall their alcohol consumption. Of the 171 students who completed the first portion of the study, 81% also completed the second portion. Of the 139 students who completed both portions of the study, 73% provided information regarding their living arrangement resulting in a total of 101 participants.

Analytical approach

Analysis of variance was used to examine differences between living arrangements with regard to total binge drinking days, total drinking days, RAPI scores, and self-esteem scores. Multiple linear regressions were used to examine the consistency of the association between self-esteem and drinking behaviors across the different living arrangements.

RESULTS

Descriptive statistics for age, alcohol use and self-esteem are presented in Table I. Values three standard deviations above or below the mean were classified as outliers. We identified four outliers on binge drinking, five on total drinking days, and four on RAPI scores. The outliers were transformed to scores one unit higher than three standard deviations above the mean (Field, 2005). Parallel analyses with and without transformation of outliers yielded equivalent patterns of results; therefore, we present analyses using transformed variables. The range of scores on alcohol use and self-esteem were consistent with reports of

Table I. Descriptive statistics for different living arrangements.

	Off campus (<i>N</i> = 37) M (SD)	With parents (<i>N</i> = 28) M (SD)	On campus (<i>N</i> = 36) M (SD)	<i>F</i> test
Age	20.70 (2.91)	19.61 (2.22)	18.97 (0.74)	5.98*
Self-esteem	21.78 (5.00)	22.21 (4.95)	22.39 (4.67)	0.15
RAPI	10.97 (8.20)	8.14 (6.14)	9.31 (6.68)	1.30
Binge days	31.11 (31.77)	21.43 (20.29)	29.61 (26.24)	1.14
Drinking day	62.95 (36.60)	41.93 (28.45)	58.53 (33.75)	3.47*

Note: Outliers transformed to scores one unit higher than three standard deviations above the mean.

*Signifies 2-way differences at $p < 0.05$.

previous studies of college students (Carlson, Johnson, & Jacobs, 2010; Collins et al., 2008; Kuo et al., 2003)

Univariate analysis of variance was used to compare demographics and drinking behaviors across living arrangements (Table I). Participants did not differ in levels of self-esteem across the different living arrangements. A significant difference in mean age was found between students living off campus ($M = 20.31$, $SD = 0.27$) and participants living on campus ($M = 18.97$, $SD = 0.27$), $F(2, 98) = 5.98$, $p < 0.01$. There was no significant difference in mean age between students living on campus and living with parents ($M = 19.61$, $SD = 0.41$), $F(2, 98) = 2.60$, $p = 0.11$; or between students living off campus and students living with parents, $F(2, 98) = 1.75$, $p = 0.10$. The ANOVA identified differences according to living arrangements with regard to total drinking days $F(2, 98) = 3.47$, $p < 0.05$ such that participants living off campus ($M = 62.95$, $SD = 36.60$) reported more total drinking days than students living on campus ($M = 58.53$, $SD = 32.19$), ($t = 42.31$, $df = 100$), and students living with parents ($M = 41.93$, $SD = 28.45$), ($t = 25.35$, $df = 100$). Students living on campus also reported more total drinking days than did students living with parents ($t = 17.00$, $df = 100$). No differences were found for binge drinking days, $F(2, 98) = 1.14$, $p = 0.33$, RAPI scores, $F(2, 98) = 1.30$, $p = 0.28$, or self-esteem, $F(2, 98) = 0.15$, $p = 0.86$.

Linear regressions were conducted to determine the predictive value of self-esteem on drinking behaviors across the entire sample. The results indicated no difference in binge drinking days, $B = -0.02$, $t(99) = -0.23$, $p = 0.83$, and an inverse relationship between self-esteem and scores on the RAPI, $B = -0.18$, $t(99) = -2.07$, $p < 0.05$. Linear regressions were then conducted to determine whether the predictive value of self-esteem on drinking behaviors was consistent across the different living arrangements. According to Baron and Kenney (1986), to determine whether there is a moderating effect, one must first compute an interaction term (living \times self-esteem). In the regression, this interaction term must be significant while controlling for the predictor and moderating variable. The interactions were not significant, which indicated that the relationship between self-esteem and drinking behavior was equivalent for participants living

RAPI Scores By Self-esteem and Living Arrangement

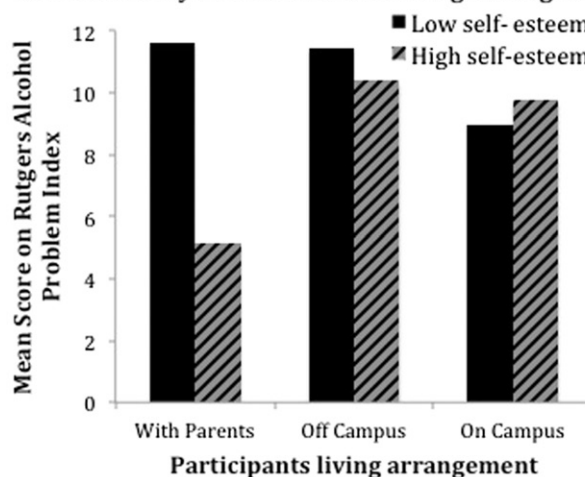


Figure 1. RAPI scores by self-esteem and living arrangement.

off campus and participants living on campus or with parents. When living on campus and living with parents were compared, an interaction occurred for binge drinking days $B = 1.43$, $t(60) = 2.23$, $p < 0.05$ and RAPI scores $B = 1.32$, $t(60) = 2.03$, $p < 0.05$, indicating that the influence of self-esteem on drinking behaviors is moderated by living arrangement. In order to facilitate graphical representation of results (Figure 1) we conducted discrete group analysis based on median splits on the self-esteem scale. The median score was 22, the mean of the low group was 18.43 ($SD = 3.04$) and the mean of the high group was 26.36 ($SD = 2.36$). Post hoc analyses (Table II) were conducted using the continuous variable of self-esteem to determine the nature of the interaction. The results indicated that self-esteem predicted binge drinking and scores on the RAPI among participants living with their parents, but not among students living on campus. There were no significant differences found between participants living off campus and those living on campus or with parents.

DISCUSSION

Our findings suggest that self-esteem differentially influences alcohol use and related problems across

Table II. Post hoc linear regression of self-esteem predicting drinking behaviors.

	<i>B</i> (SE)	β	Significance	<i>R</i> ²
RAPI Score				
Living with parents	-0.55 (0.22)	-0.45	0.02	0.20
Living on campus	0.12 (0.24)	0.09	0.62	0.01
Living off campus	-0.34 (0.27)	0.04	-0.20	0.04
Binge drinking				
Living with parents	-1.76 (0.73)	-0.43	0.02	0.18
Living on campus	0.98 (0.95)	0.17	0.31	0.03
Living off campus	0.24 (1.11)	0.04	0.83	0.01

living arrangements. Although aggregate examination revealed the predicted inverse association between self-esteem and problematic alcohol use, further examination separated by living arrangements indicated that this association was inconsistent. Specifically, comparing participants living on campus with participants living with parents, lower levels of self-esteem were associated with binge drinking and alcohol-related problems only among participants living with their parents.

The finding of a moderating effect of living arrangement on the association between self-esteem and drinking behaviors is novel; to our knowledge, no previous research has examined the influence of living arrangement on the predictive value of self-esteem among college student populations. In general, these findings highlight the importance of considering living arrangements when examining risk factors for hazardous drinking among college students, as the pathways to problematic alcohol use may differ according to living situations. Previous findings regarding the relationship between living arrangement and alcohol use in college students may be useful in elucidating these different pathways. For example, a study of the relationships among living arrangement, identity development, life difficulties, and coping among college students found that students living with their parents were more likely to be in the process of developing an adult identity, and to report higher levels of depression and anxiety and lower levels of self-control (Jordyn & Byrd, 2003). In contrast, students living away from parents used more direct, problem-focused coping methods than students living with parents. With regard to the present study, these findings point to potential associations between living with parents and the use of alcohol to cope with higher levels of negative emotions such as anxiety or depression that have been associated with lower self-esteem (Brockner, 1983; Pyszczynski & Greenberg, 1987). In contrast, students living on campus may be more likely use alcohol for other reasons such as socialization. Future research examining differences in drinking motives across different living arrangements may help to further tease apart this complex relationship.

Another potential explanation for our results involves the nature of parental relationships. Living with parents may be a protective factor against associating with heavy-drinking peers and engaging in risky drinking behaviors (Hardford, Wechsler, & Muhen, 2002; White et al., 2006; White, Fleming, Kim, & Catalano, 2008), it may also strain parent-child relationships and thereby increase risk for problematic alcohol use. For example, a study examining residential settings and parent-adolescent relationships during college years found that students who lived at home reported more conflict and avoidance in their relationships with their parents than did students living apart from parents. Moreover, students living away from their parents reported more support, whereas students living at home reported more rejection of their parents as role models (Flanagan, Schulenberg, & Fuligni, 1993). If students living with their parents are experiencing conflict in their relationship with their parents, it may limit the capacity for students to utilize parents in their coping methods and thereby increase use of other methods of coping such as alcohol consumption.

A final possible explanation for the results could be that for participants with high self-esteem, living with parents may serve as a protective factor against alcohol use and related problems. Research generally supports the link between parent relationships and self-esteem, such that a positive relationship and secure attachments is associated with high levels of self-esteem (Armsdern & Greenberg, 1987; Coopersmith, 1967; Greenberg, Siegal, & Lietch, 1984). It may be possible that among the participants living with their parents, those with high self-esteem also have secure, positive attachment with their parents, thereby protecting them against alcohol use and related problems. In contrast, participants on campus may also have a secure attachment to their parents, but peer influences and campus environment may have a stronger impact on their decisions as they do not have the direct influence of their parents in the campus setting. Future research on the direct and indirect impact of parent relationships will help to provide further understanding of the possible protective influence living with parents may have against alcohol use and related problems.

There are some limitations to this study. The relatively small sample size and the reliance on a single university sample warrant some caution in generalizing our results. Although the sample size was sufficient for the analyses conducted, a replication of the study with larger sample sizes across different university samples would be useful in better understanding the influence of living arrangements on the relationship between self-esteem and risky drinking behaviors. Furthermore, a larger sample could be useful in examining other possible avenues such as gender differences in the impact of living arrangement on risk factors for drinking behaviors. A larger sample

might also have facilitated the examination of the extent to which mediating factors in the association between self-esteem and alcohol use, such as affect regulation and peer approval seeking (Neighbors et al., 2004), also vary according to living situation. A further limitation involves the potential influence of age due to small age differences across living arrangement; however, because age was not related to self-esteem or alcohol use, it does not seem likely to present a substantial confound to our interpretation of results. Nonetheless, the findings of this study highlight a gap in the present literature and provide a good starting point for future research.

Another limitation is the retrospective design of the study. The Timeline Followback method requires participants to provide retrospective estimates of their daily drinking over the past year; which runs the risk of participants either under reporting or over reporting their drinking levels. Furthermore, as we collected drinking behaviors over a period of 12 months, it is possible that students changed living arrangements during this time, particularly during the summer months. However, this method is recommended by the NIAAA and has been shown to have good psychometric properties (Sobell & Sobell, 1992). The limitations of our study are balanced by several strengths. Our improved methodology allowed for a more accurate measure of drinking behaviors. As mentioned previously, most studies employ quantity frequency measures (Collins et al., 2008) that do not allow situational factors to be taken into account. The Timeline Followback method allows for collection of data over a longer period of time and therefore provides a more accurate and complete picture of drinking behaviors.

The findings from this study have clinical and theoretical implications. In general, our findings highlight the importance of examining living arrangements when examining the influence of individual differences on hazardous drinking among college students. The pathways to problematic alcohol consumption may differ according to living arrangements; as such the effectiveness of preventative interventions may also differ and living arrangements may represent an important factor for designing more individualized interventions. Indeed, the knowledge that living arrangement may influence risk factors for alcohol use can be helpful in prevention or awareness campaigns regarding risky drinking behaviors. The results of the study also suggest that future studies should consider the potential moderating effects of living arrangement on other risk factors for hazardous alcohol use.

Declaration of interest: The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the article.

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