

Published in final edited form as:

Drug Alcohol Depend. 2014 October 1; 143: 198–205. doi:10.1016/j.drugalcdep.2014.07.024.

Interactions among drinking identity, gender and decisional balance in predicting alcohol use and problems among college students

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Abstract

Background—The aim of the present study was to test promising constructs (decisional balance and drinking identity) and their interaction with gender as predictors of risky college drinking. We expected that, consistent with previous work, drinking identity would be positively associated with alcohol consumption and problems. We further expected that drinking identity would be more strongly related to outcomes among individuals scoring low in decisional balance. Additionally, we expect the relationship between drinking identity and alcohol behavior to vary as a function of decisional balance.

Methods—Participants included 329 undergraduates ($M = 23.11$; $SD = 5.63$; 74.47% female) who met heavy drinking criteria (defined as women who consumed 4 or more drinks per occasion and men who consumed 5 or more drinks per occasion) and completed an online survey comprised of self-report measures.

Results—Decisional balance was negatively correlated with both drinking and problems, which partially supported expectations. As expected, drinking identity was positively correlated with drinking and problems. A two-way interaction emerged between drinking identity and decisional balance regarding problems, indicating that drinking identity was associated with more problems,

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Contributors

Dawn Foster designed the study, collected data, conducted literature searches, and drafted the manuscript. Chelsie Young and Nelson Yeung supported the analyses. Jennifer Bryan supported the introduction section. Mai-Ly Steers supported the discussion section. Alexander Prokhorov provided feedback to manuscript drafts. All authors supported overall manuscript development.

Conflict of Interest

The authors declare that they have no conflicts of interest.

especially among those lower in decisional balance. A three-way interaction between drinking identity, decisional balance, and gender emerged regarding problems such that drinking identity was associated with more problems for those lower in decisional balance and this effect was stronger among men.

Discussion—Findings lend support to the perspective that decisional balance, drinking identity, and gender are all influential factors that are associated with the experience of alcohol problems.

Keywords

drinking identity; gender; decisional balance; alcohol; drinking

1. INTRODUCTION

College students are more likely to drink heavily than their non-college peers (Johnston et al., 2012). On average, about 40% of college students report having engaged in heavy drinking during the last two weeks (Johnston et al., 2006). Heavy episodic drinking (binge drinking) occurs when a woman consumes four drinks in a row or when a man consumes five drinks on one occasion at least once in a 2-week period (Courtney and Polich, 2009). Heavy episodic drinking among college students is associated with a range of serious primary (e.g., psychological impairment, memory loss, risky sexual behavior, unplanned pregnancies, suicidal ideation, and addiction) and secondary consequences (e.g., academic impairment, sexual victimization, car accidents, violence, and death; Hingson and Zha, 2009; Gonzalez and Hewell, 2012; Ragsdale et al., 2012). Thus, the U.S. Surgeon General has declared reducing heavy drinking among college students a major health goal for the country (U.S. Department of Health and Human Services, 2012).

Although many college drinking interventions have been developed and evaluated, findings have indicated modest effects of these interventions, especially over the longer term (see Scott-Sheldon et al., 2014 for a meta-analytic review). Thus, it is important to continue to explore predictors of risky college drinking, focusing on their complex interactions with one another, to provide ideas for further tailoring of college drinking interventions. In this study, we evaluated the relative contributions of some innovative and promising predictors, decisional balance and drinking identity, and their interactions with gender to aid in the prediction of risky college drinking.

1.1 Decisional balance and college drinking

Researchers seeking to develop effective strategies to reduce alcohol misuse and associated problems among college students have considered the importance of increasing motivation for effectual decision-making. In this context, the decisional balance procedure is a motivational tool used to facilitate decision-making and asks individuals to list both their personal pros and cons of maintaining and changing their drinking behaviors. This allows the individual to reflect on their drinking behavior. Previous work suggests that decisional balance can be used to overcome denial and enhance alcohol problem recognition (McCready and Epstein, 1999; Nye et al., 1999), and that it has shown mixed outcomes as an

intervention to decrease college drinking and related problems (Carey et al., 2006; Collins et al., 2005; LaBrie et al., 2006).

In addition to exploring the utility of decisional balance as an intervention, researchers have validated decisional balance as an assessment of the extent to which a person's motivation is balanced toward behavior change (Collins et al., 2009; Cunningham et al., 1997; King and Diclemente, 1993; Migneault et al., 1999). Decisional balance theoretically overlaps with motivation to change, a construct that stems from the Transtheoretical Model (Prochaska et al., 1992). Studies have indicated that decisional balance has been associated with drinking outcomes (e.g., LaBrie et al., 2006; Share et al., 2004). Research has also shown that decisional balance has better predictive validity for drinking outcomes compared to alcohol expectancies (Noar et al., 2003) and readiness to change (Collins et al., 2009). Therefore, we expected that decisional balance would be negatively associated with drinking and positively associated with problems.

1.2 Drinking identity

Although Transtheoretical Model-based drinking studies have not specifically explored drinking identity (e.g., Sun et al., 2007), research generally suggests that drinking identity is positively associated with alcohol consumption (e.g., Neighbors et al., 2010; Reed et al., 2007), which in turn is linked with alcohol-related problems (e.g., Lindgren et al., 2013). Drinking identity is conceptualized as how central or defining alcohol consumption is to one's self-identity (Conner et al., 1999). How integrated drinking is in one's self-identity may influence both drinking behavior and motivation for drinking. For instance, social media-related drinking identity (i.e., posting photos of one consuming alcohol) was related to higher alcohol consumption and problematic alcohol-related behaviors (Ridout et al., 2012).

1.3 Gender

Previous research has demonstrated time and again that gender is a central factor to consider in alcohol research (Choo et al., 2013; Korcha et al., 2014). With regard to increased drinking and associated problems, males have consistently been shown to be at greater risk than females (e.g., Caetano, 1994; Greenfield et al., 2000; Korcuska and Thomas 2003; Randolph et al., 2009). College students also report that they believe men drink more heavily, are more likely to drink and drive, are less concerned with campus alcohol use, and use fewer protective behavioral strategies than their female counterparts (Lewis and Neighbors, 2004; Lewis et al., 2009). In order to inform more effective interventions for targeted harm reduction, researchers have recognized the need for both increased concentration on college populations and more in-depth investigation of subgroup differences (e.g., gender; Cranford et al., 2009; O'Brien et al., 2004). As such, research examining gender differences with respect to known antecedents to drinking (drinking identity) and buffers against drinking (decisional balance) may have both practical utility and clinical significance in terms of informing drink-reduction programs.

1.4 Interactions among decisional balance, drinking identity, and gender with respect to alcohol outcomes

Although these variables have been studied separately, the interactions among these variables in their association with alcohol use and related problems have not yet been fully explored. Regarding the influence of gender on decisional balance, previous research among students sanctioned for violating the university's alcohol policy revealed that males reported more pros to continue drinking and that they were less ready to change their drinking habits relative to females (Carey and DeMartini, 2010). Further, males thought their friends were more approving of the alcohol sanction than females. Thus, males may have experienced social pressure to maintain their drinking because their friends were more understanding of them being sanctioned for alcohol use. However, it is unclear if this effect would remain if students' friends were unaware that they were participating in an alcohol reduction program as student's friends may be more aware of the amount of drinks the student is consuming and may be more likely to encourage increased drinking. O'Hea and colleagues (2003) examined gender differences in decisional balance without social pressure to engage in a given behavior and revealed that males reported greater positivity than females in both smoking cessation and engagement in exercise, while no gender differences were revealed with dietary fat reduction.

Further, drinking identity and gender differences therein have been revealed such that college males have reported stronger drinking identities than college females (Foster et al., 2013). Moreover, undergraduate males may view heavy drinking as part of being a man (Peralta, 2007). The majority of college age males perceive the ability to consume large amounts of alcohol without negative consequences (e.g., vomiting, fainting) as masculine, and view the experience of these consequences as feminine and weak (Peralta, 2007). Past research has demonstrated that the process for changing drinking behavior is different by gender such that men are more likely to change after an adverse event whereas women are more likely to change their drinking behavior when they are able to modify how they identify with the behavior (Bischof et al., 2000; Klingemann, 1991).

1.5 Current study aims and hypotheses

The aim of the present study was to test promising constructs (decisional balance and drinking identity) and their interaction with gender as predictors of risky college drinking. Consistent with past research, we expected that drinking identity would be positively associated with alcohol consumption and problems. Moreover, we examined the relationship between drinking identity and alcohol outcomes by considering decisional balance as a potential moderator. Specifically, we expected that drinking identity would be more strongly related to outcomes among individuals scoring low in decisional balance (that is, participants who receive a decisional balance score closer to 0, as calculated per details outlined by Collins et al. 2009). As drinking identity is positively related to alcohol behavior, we expect this relationship to vary as a function of decisional balance. To illustrate, it is possible that individuals whose self-identity is strongly intertwined with alcohol consumption (those high in drinking identity) may be at greater risk for problems if they also have low motivation to reduce their drinking (those low in decisional balance). It is possible that those who are high in drinking identity may also experience or identify with

drinking-related problems such as going to school drunk or neglecting to study for a test. Thus, these problems may be viewed as humorous or banal and not be acknowledged as reason to change alcohol consumption. Therefore, we expected that decisional balance would moderate the relationship between drinking identity and alcohol-related problems such that those higher in drinking identity would report more problems compared to those lower in drinking identity, and this relationship would be stronger among those lower in decisional balance.

Taken together, we expect that: 1) decisional balance will be negatively associated with drinking and positively associated with problems; 2) drinking identity will be positively associated with alcohol consumption and problems; 3) decisional balance will moderate the relationship between drinking identity and problems; and 4) the moderating influence of decisional balance on the relationship between drinking identity and problems will differentially emerge for males and females. More specifically, we hypothesize that drinking identity will be most strongly related to problems among males low in decisional balance (not ready to change), and less strongly related to problems among males high in decisional balance. In other words, we expect that decisional balance will buffer against alcohol problems among males, regardless of their drinking identity level, however this buffering effect will be less evident among females.

2. METHOD

2.1 Participants and procedure

The current research included 329 heavy drinking (defined as women who reported consuming 4 or more drinks per occasion and men who reported consuming 5 or more drinks per occasion) undergraduate students (74.47% female) from a large public university in the south (total student body $N = 39,820$ in 2011) who completed study materials as part of a larger intervention. Data were evaluated at the baseline assessment of the larger trial. Participants were recruited via announcements in classrooms (psychology, education, health, and human development and family studies) and flyers posted around campus. Participants completed surveys online via DatStat and received course extra credit as compensation for their involvement. Participants' mean age was 23.11 years ($SD = 5.63$). Participants self-reported the following races: 55.73% Caucasian, 11.46% Black/African American, 12.69% Asian, 0.93% Native Hawaiian/Pacific Islander, 7.12% Multi-Ethnic, 0.31% Native American/American Indian, and 11.76% Other. Additionally, 31.17% of participants reported as Hispanic/Latino.

Measures

2.2 Demographics—Participants reported demographic information including gender, age, racial background, and ethnicity.

2.3 Alcohol use—Alcohol consumption was measured using the Quantity/Frequency Scale (Baer, 1993; Marlatt et al., 1995), which is a five-item measure that assesses the number of alcoholic beverages and the number of hours spent drinking on a peak drinking event within the past month. The Quantity/Frequency Scale further assesses the number of

days out of the month that the individual consumed alcohol (0 = I do not drink at all, 1 = about once per month, 2 = two to three times a month, 3 = once or twice per week, 4 = three to four times per week, 5 = almost every day, or 6 = I drink once daily or more). Alcohol consumption was also evaluated using the *Daily Drinking Questionnaire* (Collins et al., 1985; Kivlahan et al., 1990), which measures the number of standard drinks consumed on each day of the week (Monday-Sunday) within the last three months. Scores represent the average number of drinks consumed over the course of each week during the previous month. Relative to other drinking indices, weekly drinking is a reliable index of problems among undergraduates (Borsari et al., 2001).

2.4 Alcohol-related problems—The *Rutgers Alcohol Problem Index* (White and Labouvie, 1989) is a 25-item measure that assesses alcohol-related negative consequences in the last month ($[\alpha] = .93$). Responses range from never (0) to 10 times or more (4). Items were rated based on how many times each problem occurred while drinking (e.g., “Went to work or school high or drunk,” “Felt physically or psychologically dependent on alcohol”). Total summed scores ranged from 0 to 97 (White and Labouvie, 1989).

2.5 Decisional balance—The Decisional Balance Sheet is a free recall task that evaluates the accessibility of alcohol expectancies. Participants were asked to record as many benefits (pros) and disadvantages (cons) of “continuing to drink as you are now” and “drinking less than you do now” on numbered lines. Each participant received a decisional balance score calculated from the ratio of pros and cons in compliance with Collins et al. (2009). Decisional balance proportion scores between 0.0 and 0.5 indicate that the individual is leaning toward maintaining current levels of drinking. Scores ranging between 0.5 and 1.0 indicate that the individual is leaning toward reducing alcohol consumption. Decisional balance scores at 0.5 signify an even balance between benefits and disadvantages of changing or maintaining current drinking behaviors.

2.6 Drinking identity—Drinking identity was assessed using a five-item scale adapted from the Smoker Self-Concept Scale (Shadel and Mermelstein, 1996). The drinking identity scale assesses the degree to which participants believe drinking is integrated into their own self-concepts. Sample items include “Others view drinking as part of my personality”, and “Drinking is part of who I am”. Respondents report the extent to which they agree with items ranging from 1 = *Strongly disagree* to 7 = *Strongly agree*. Scores are then averaged for a mean drinking identify score ($[\alpha] = .94$).

2.7 Readiness to change—The Readiness to Change Questionnaire (Rollnick et al., 1992) is a 12-item index of level of agreement with statements about how individuals feel about their current drinking. Respondents used a 5-point Likert scale ranging from 1 (*Strongly disagree*) to 7 (*Strongly agree*) to rate items including “I should cut down on my drinking” and “My drinking is a problem.” Items measure ambivalence, recognition of an alcohol problem, and active attempts to change drinking. This measure consists of three validated sub-scales: pre-contemplation, contemplation, and action. For the present study, an overall readiness to change score was utilized.

2.8 Data analysis plan—The aim of the present study was to better understand relationships among decisional balance, drinking identity, gender, and alcohol-related problems. Thus, we conducted moderation analyses to determine whether there were gender differences in decisional balance and drinking identity with respect to alcohol outcomes. To test our hypothesis that the relationship between drinking identity and alcohol outcomes would be moderated by decisional balance, and that this effect would differ based on gender, multiple hierarchical regressions were conducted. At Step 1, we included drinking identity, decisional balance, and gender as independent variables. At Step 2, we added two-way product terms between drinking identity and decisional balance, gender and drinking identity, and gender and decisional balance to evaluate two-way interaction effects. At Step 3, we included the three-way interaction term between drinking identity, decisional balance, and gender.

All continuous independent variables were centered prior to analyses (Aiken and West, 1991). Drinks per week were used as a covariate for all analyses where alcohol-related problems was the outcome, which allows us to determine whether effects on problems are above and beyond alcohol consumption. In the present study, for statistically significant interactions, simple slopes analyses were conducted to examine whether the slopes of the regression lines differed from zero at high and low levels of the moderator or across different groups if the moderator is categorical (e.g., males and females). In each simple slopes analysis, two regression equations were constructed. One equation represented the relationship between the independent variable and dependent variable at a lower level of moderator (-1 SD); and another one represented the relationship between the independent variable and dependent variable at a higher level of moderator ($+1$ SD). Similarly, when gender was the moderator, two separate regression equations were constructed to represent the relationship between the independent variable and the dependent variable among males and females.

3. RESULTS

3.1 Descriptives

Means, standard deviations, and correlations for the key variables are presented in Table 1. Drinking identity was significantly and positively correlated with drinking and problems, indicating that higher levels of drinking identity were related to more drinking and alcohol-related problems. Thus, our findings with respect to drinking identity are consistent with previous literature and support our expectations. Decisional balance was significantly and negatively correlated with alcohol-related problems as well as alcohol consumption variables (peak drinks and drinks per week). Furthermore, all drinking and alcohol-related problems indices were positively related. Readiness to change was marginally positively associated with decisional balance, and was significantly positively associated with alcohol problems and all consumption variables. Finally, drinking identity and decisional balance were unrelated.

3.2 Primary analyses

Regression analyses were conducted to evaluate relationships among drinking identity, decisional balance, gender, and alcohol-related problems. For the model wherein alcohol problems were examined as dependent variables, we found a positive association between drinking identity and problems ($\beta = 0.29, p < .0001$). This is in line with expectations. However, contrary to expectations, we found a negative association between decisional balance and problems ($\beta = -0.11, p = .03$). The covariate in the model was related to alcohol-related problems as expected, with drinking as measured by drinks per week being significantly associated with alcohol-related problems ($\beta = 0.28, p < .0001$). Thus, stronger identification with alcohol and heavier drinking were associated with experiencing more alcohol-related problems; whereas decisional balance was linked with fewer problems. At Step 2, significant two-way interactions emerged between drinking identity and decisional balance ($\beta = -0.19, p < .0001$), and between gender and decisional balance ($\beta = -0.13, p = .02$), with respect to alcohol-related problems. Problems were higher at higher levels of drinking identity, particularly among individuals lower in decisional balance. Similarly, men tended to report greater alcohol-related problems, especially if they were lower in decisional balance. The two-way interaction between gender and drinking identity regarding alcohol problems was not significant. At Step 3, the three-way interaction between drinking identity, decisional balance, and gender with respect to alcohol problems was also significant ($\beta = -0.17, p = .009$). The positive association between drinking identity and alcohol-related problems was stronger among men lower in decisional balance. A similar pattern was found for women.

Analyses were replicated for alcohol consumption variables (weekly drinking and peak drinks). For the model wherein weekly drinking was examined as the dependent variable, significant associations emerged as expected for decisional balance ($\beta = -0.14, p = .01$), drinking identity ($\beta = 0.32, p < .0001$), and gender ($\beta = 0.11, p = .04$). A significant two-way interaction emerged between drinking identity and gender with respect to drinks per week ($\beta = 0.18, p = .01$). For the model wherein peak drinks was examined as the dependent variable, findings were consistent with expectations in that gender exhibited significant main effects on peak drinking ($\beta = 0.34, p < .0001$). Decisional balance was marginally associated with peak drinks ($\beta = -0.10, p = .06$). A marginal two-way interaction emerged between decisional balance drinking identity with respect to peak drinks ($\beta = -0.10, p < .06$). However, as expected, no three-way interactions emerged as significant with respect to alcohol consumption variables.

Interactions related to problems were graphed using parameter estimates from the regression equation as described in Cohen, Cohen, West, & Aiken (2003). Values in the figures represent the number of alcohol-related problems that would be expected for an individual who scored one standard deviation above (high) and below (low) the mean of drinking identity and one standard deviation above (high) and below (low) the mean of decisional balance. Figure 1 reveals that drinking identity was associated with higher alcohol problems, and this relationship was stronger among individuals lower in decisional balance compared to individuals higher in decisional balance. Taking gender and drinks per week into account, results from simple slopes analysis also indicated that the positive association between

drinking identity and alcohol-related problems was significant at a lower level (-1 SD) of decisional balance ($\beta = 0.51, p < .001$), but not at a higher level ($+1$ SD) of decisional balance ($\beta = 0.05, p = .455$). Thus, higher levels of decisional balance may buffer against the positive association between drinking identity and alcohol-related problems. Figure 2 shows the interaction between gender and decisional balance such that the negative association between decisional balance and alcohol-related problems was stronger among males than females. Controlling for drinking identity and drinks per week, simple slopes analysis revealed that the negative association between decisional balance and alcohol-related problems was significant for males ($\beta = -0.37, p < .001$), but not for females ($\beta = -0.01, p = .854$). Thus, findings suggest that the protective role of decisional balance in alcohol-related problems may only be apparent among males. Figures 3 and 4 summarize the three-way interaction between drinking identity, decisional balance, and gender. Figure 3 shows the pattern for males and Figure 4 for females. For males, controlling for drinks per week, results from simple slopes analysis indicated that the positive association between drinking identity and alcohol-related problems was significant at a lower level of decisional balance ($\beta = 0.68, p < .001$), but not at a higher level of decisional balance ($\beta = -0.03, p = .842$). However, for females, results from simple slopes analysis indicated that the positive association between drinking identity and alcohol-related problems was significant both at a lower level of decisional balance ($\beta = 0.45, p < .001$) and a higher level of decisional balance ($\beta = 0.23, p = .045$) after controlling for drinks per week. These results suggest that a higher level of decisional balance may be closely linked to the positive association between drinking identity and alcohol-related problems among males but not females. Thus, our expectations regarding an interaction between drinking identity and decisional balance with respect to drinking variables were partially supported; interactions emerged with respect to problems, but not consumption.

4. DISCUSSION

The present research evaluated the influence of decisional balance as a moderator of the relationship between drinking identity and alcohol-related problems, and also examined how this association might differ as a function of gender. Based on previous research that indicates that motivation to reduce alcohol use is linked to decreased alcohol consumption and also increased alcohol-related problems (McCrary and Epstein, 1999; Nye et al., 1999; Rollnick et al., 1992), we expected that decisional balance, conceptualized as motivation to change behavior, would be negatively correlated with drinking and positively associated with problems. This hypothesis was partially supported. As expected, decisional balance was significantly and negatively correlated with drinking (peak drinks and drinks per week). This result makes intuitive sense as individuals who are reflecting on the pros and cons of drinking would most likely drink less.

However, contrary to expectations, we found a negative association between decisional balance and alcohol-related problems. One possibility for this finding is that individuals who are higher in decisional balance may have already reduced their drinking as a precautionary measure, and, therefore, experience fewer alcohol-related problems. Alternatively, it is also plausible that heavier drinkers may not be ready or lack the motivation (as represented by lower decisional balance) to change their heavy drinking habits despite experiencing greater

alcohol-related problems. Along these lines, it is also plausible that heavier drinkers may be experiencing more psychological reactance in response to the decisional balance, and therefore may be listing more pros and fewer cons to drinking (lower decisional balance) so as to avoid directly confronting their alcohol-related problems.

We further found that, consistent with expectations, drinking identity was positively associated with drinking and problems. This result is in line with previous research which evidenced that drinking identity is associated with increased drinking (e.g., Neighbors et al., 2010; Reed et al., 2007) and perhaps, as a consequence, higher alcohol-related problems (e.g., Lindgren et al., 2012). Also consistent with predictions, results revealed a significant two-way interaction between drinking identity and decisional balance regarding alcohol-related problems, such that drinking identity was associated with increased alcohol-related problems, particularly among those lower in decisional balance. In addition, tests of the simple slopes revealed that the positive association between drinking identity and alcohol-related problems was significantly different from zero at lower levels of decisional balance but not at higher levels of decisional balance.

According to Social Identity (Hogg et al., 2003; Terry and Hogg, 1996) and Self-Categorization Theory (Turner et al., 1987), an individual's identity is often shaped by group norms of important groups to which they belong. That is, individuals who are higher in drinking identity may associate with groups who tend to drink more heavily. Further, those who are lower in decisional balance may be less motivated to change their drinking behavior. This lack of motivation may stem from the fact that drinking is often viewed as an integral way for students to bond with in-group members in college. Therefore, individuals who are lower in decisional balance but higher in drinking identity may be less motivated to change their drinking behaviors in order to fit in with group norms, and consequently, experience more alcohol-related problems.

Furthermore, results revealed a significant two-way interaction between decisional balance and gender with respect to problems, such that higher decisional balance was associated with less alcohol-related problems, and this relationship was stronger among males. Moreover, tests of the simple slopes revealed that the negative association between decisional balance and alcohol-related problems was significantly different from zero for men but not for women. Thus, it appears that higher levels of decisional balance were more strongly associated with lower alcohol-related problems for men relative to women. As aforementioned, the literature has shown that men in college are more at-risk for drinking and related problems than women (e.g., Caetano, 1994; Greenfield et al., 2000; Korcuska and Thomas 2003; Randolph et al., 2009). However, decisional balance appears to be linked with reductions in alcohol-related problems, particularly for men.

Consistent with expectations, a three-way interaction for drinking identity, decisional balance, and gender with respect to alcohol-related problems emerged. That is, the positive association between drinking identity and alcohol-related problems was stronger for men lower in decisional balance. This is consistent with other research that has demonstrated that men tend to identify more strongly with drinking than women (Foster et al., 2013). Further, the mean of the current sample for males on drinking identity ($M = 1.21$) was nearly double

of that for females ($M = .67$). These findings highlight the fact that men who are higher in drinking identity and also lower in decisional balance might be at-risk for developing more severe alcohol-related problems relative to men or women lower in drinking identity or decisional balance. Moreover, a similar yet less pronounced pattern was evidenced for women who were higher in drinking identity and lower in decisional balance. Therefore, researchers should consider promoting strategies to increase motivation to change and decrease self-identification with drinking for these at-risk groups of men and women.

4.1 Limitations and future directions

The strengths of the present research should be considered in light of some limitations. One limitation was that there was a relatively low representation of males in the present study. Additionally, the data were cross-sectional. Thus, any causal inferences are attenuated. Future studies might consider examining the trajectories of drinking identity, decisional balance, and problem alcohol use over time to better understand these associations. Future research might also explore whether engaging in decisional balance immediately prior to attending social drinking situations might mitigate drinking and alcohol-related problems, particularly for individuals high in drinking identity. This might better elucidate the efficacy of decisional balance in the context of alcohol interventions.

4.2 Conclusion

In the present study, we conducted a cross-sectional evaluation of the main effects and interactions of decisional balance, drinking identity and gender in predicting alcohol outcomes among college students. Specifically, students who were male, had stronger drinking identities, and a decisional balance that tipped away from behavior change, reported higher levels of drinking and alcohol-related problems compared to their college peers. The overall implication of the present research is that all of these factors and their interactions are important predictors that should be considered in future assessments with college drinkers. Perhaps certain at-risk groups could be targeted for more comprehensive intervention. Further, decisional balance, drinking identity, and their intersection with gender could be combined into interventions that are tailored to these different groups' needs. Future studies are needed to explore these potential new ways to decrease alcohol-related harm among college drinkers.

Acknowledgments

Role of Funding Sources

Preparation of this manuscript was supported in part by National Institute on Drug Abuse grant K12-DA-000167 (Dr. Foster).

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Highlights

- We evaluated decisional balance as a moderator of drinking
- Drinking identity and decisional balance interacted with respect to problems
- Three-way interaction emerged when gender was included in the model

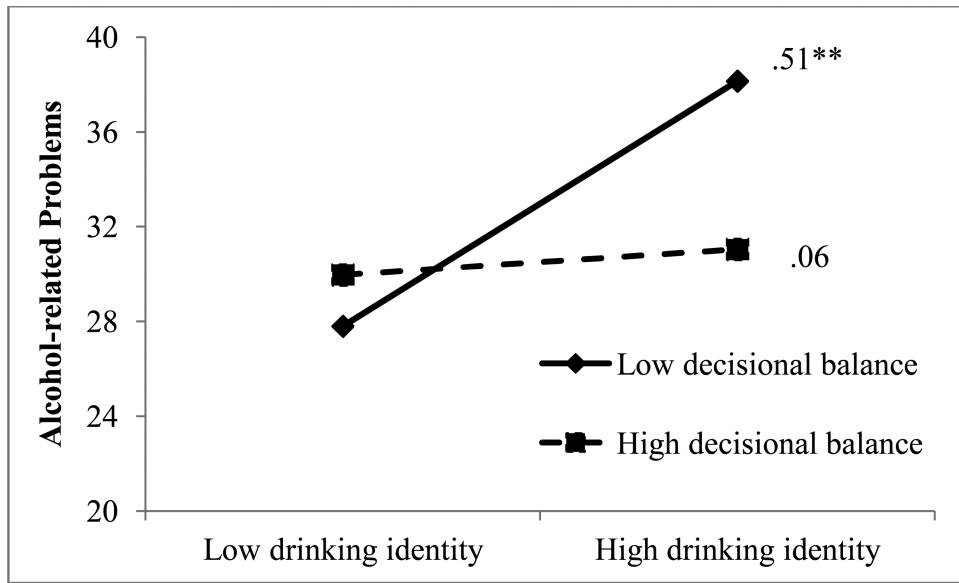


Figure 1. High drinking identity was associated with more alcohol-related problems, and this relationship was stronger among individuals lower in decisional balance.

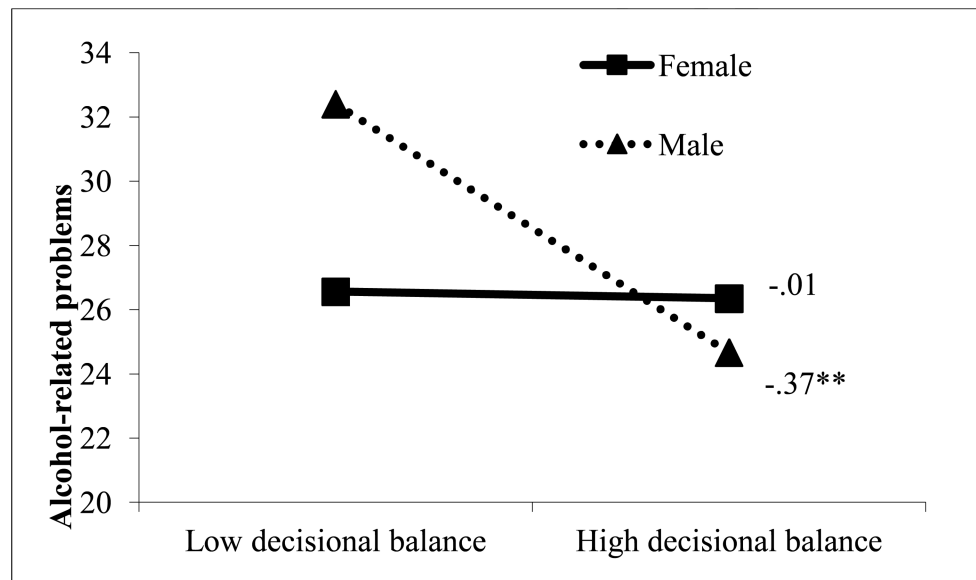


Figure 2. High decisional balance was associated with less alcohol-related problems, and this relationship was stronger among males.

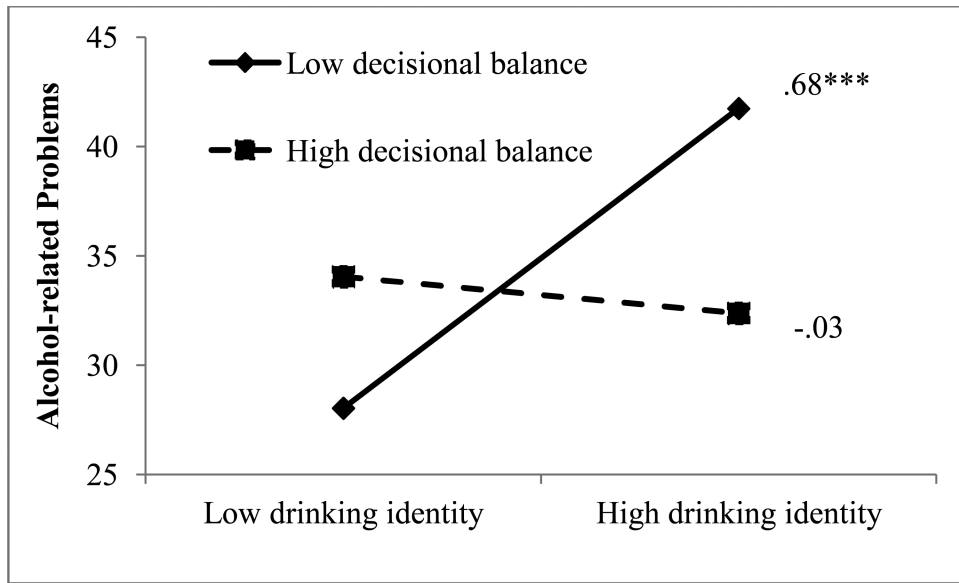


Figure 3. High drinking identity was associated with more alcohol-related problems, and this relationship was stronger among males with low decisional balance compared to males with higher decisional balance.

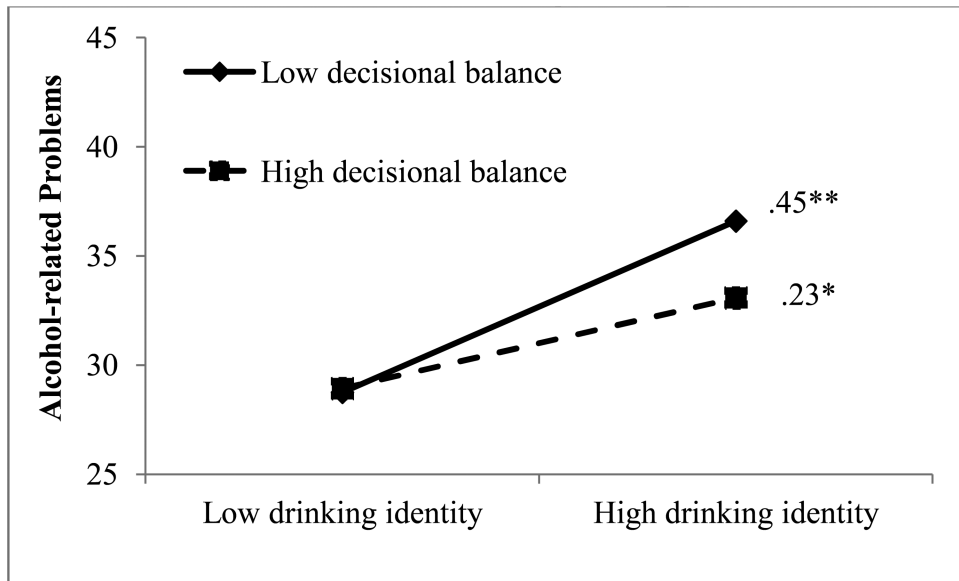


Figure 4. High drinking identity was associated with higher alcohol-related problems, and this relationship was stronger among females with low decisional balance compared to females with higher decisional balance.

Table 1

Means, Standard Deviations, Ranges, and Correlations among Variables.

	1.	2.	3.	4.	5.	6.	7.
1. Drinking identity	--						
2. Decisional balance	-0.05	--					
3. Readiness to Change	0.27 ^{***}	0.10 [†]	--				
4. Alcohol-related problems	0.40 ^{***}	-0.17 ^{**}	0.29 ^{***}	--			
5. Peak drinks	0.13 [*]	-0.11 [*]	0.17 ^{**}	0.28 ^{***}	--		
6. Drinking frequency	0.27 ^{***}	-0.03	0.16 ^{**}	0.21 ^{***}	0.13 [*]	--	
7. Drinks per week	0.34 ^{***}	-0.16 ^{**}	0.17 ^{**}	0.46 ^{***}	0.38 ^{***}	0.51 ^{***}	--
Mean	0.81	0.68	0.42	32.17	7.18	5.25	8.94
SD	1.19	0.17	1.21	9.99	3.63	2.00	7.71
Minimum	0.00	0.00	-2.33	25.00	4.00	0.00	0.00
Maximum	5.00	1.00	3.33	97.00	25.00	11.00	63.00

Note. SD = Standard Deviation

 $p < .001$ **
 $p < .01$ *
 $p < .05$ †
 $p < .10$.

Table 2

Hierarchical regression analysis predicting alcohol outcomes from drinking identity, decisional balance, and gender

Criterion		Predictor	b	t	β	p	R ²	
Alcohol-related Problems	Step 1	Drinks per Week	0.39	5.10	0.28***	<.0001	0.2801	
		Peak Drinks	0.22	1.51	0.08	0.13		
		Decisional Balance	-6.30	-2.22	-0.11*	0.03		
		Drinking Identity	2.49	5.68	0.29***	<.0001		
		Gender	1.48	1.25	0.06	0.21		
	Step 2	Decisional Balance * Drinking Identity	-9.83	-4.00	-0.19***	<.0001	0.3370	
		Decisional Balance * Gender	-14.24	-2.25	-0.13*	0.02		
		Drinking Identity * Gender	1.26	1.49	0.09	0.14		
	Step 3	Decisional Balance * Drinking Identity * Gender	-12.92	-2.64	-0.17**	0.009	0.3492	
	Drinks per Week	Step 1	Decisional Balance	-5.90	-2.67	-0.14*	0.01	0.1391
Drinking Identity			1.97	6.04	0.32***	<.0001		
Gender			1.78	2.02	0.11*	0.04		
Step 2		Decisional Balance * Drinking Identity	-1.17	-0.59	-0.03	0.56	0.1516	
		Decisional Balance * Gender	-0.36	-0.07	-0.004	0.94		
		Drinking Identity * Gender	1.87	2.75	0.18*	0.01		
Step 3		Decisional Balance * Drinking Identity * Gender	-4.00	-1.00	-0.07	0.32	0.1516	
Peak Drinks		Step 1	Decisional Balance	-2.12	-1.89	-0.10 [†]	0.06	0.1305
			Drinking Identity	0.22	1.34	0.07	0.18	
	Gender		2.87	6.43	0.34***	<.0001		
	Step 2	Decisional Balance * Drinking Identity	-1.90	-1.88	-0.10 [†]	0.06	0.1334	
		Decisional Balance * Gender	3.31	1.27	0.08	0.21		
		Drinking Identity * Gender	0.10	0.28	0.02	0.78		
	Step 3	Decisional Balance * Drinking Identity * Gender	-3.90	-1.93	-0.14 [†]	0.05	0.1407	

Note. *N* = 329.