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A New Decisional Balance Measure of Motivation to Change Among At-Risk College Drinkers

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Abstract

In this study, an open-ended decisional balance worksheet was used to elicit self-generated pros and cons of current drinking and reducing drinking, which were then quantified to create a decisional balance proportion (DBP) reflecting movement towards change (i.e., counts of pros of reducing drinking and cons of current drinking to all decisional balance fields). This study's goal was to examine the convergent, discriminant and predictive validity of the DBP as a measure of motivation to change. Participants were college students ($N=143$) who reported having engaged in weekly heavy, episodic drinking and who had participated in a larger randomized clinical trial of brief motivational interventions (Carey et al., 2006). Findings indicated partial support for convergent and discriminant validity of the DBP. Compared to Likert scale measures of decisional balance and readiness to change, DBP scores reflecting greater movement towards change best predicted reductions in heavy drinking quantity and frequency and experience of alcohol-related consequences -- although some of these effects decayed by the 12-month follow-up. Findings suggest that the DBP is a valid measure of motivation to change among at-risk college drinkers.

Keywords

decisional balance; motivation to change; college drinking; alcohol use; measure development

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Decision-making often involves consideration of a set of possible options and an evaluation of the consequences of each option. These consequences may range from desirable to undesirable effects, also referred to as pros and cons (Janis & Mann, 1977). A decisional balance has thus been operationalized as a representation of the pros and cons of a certain behavior and its potential alternatives.

The explicit consideration of the decisional balance – either as a written or counselor-facilitated exercise – was originally proposed to reduce decision-making errors by making people more cognizant of the decision-making process and the factors contributing to their decisions (Janis, 1968). In this context, decisional balance was designed as a therapeutic exercise to facilitate

the complete and realistic assessment of the net value of a potential behavior. As this technique has evolved over time, clinicians have started to employ guided decisional balance exercises as a means of enhancing motivation (Dimeff, Baer, Kivlahan, & Marlatt, 1999; Miller, 1999). Specifically, clients articulate and examine ambivalence about their current behavior to determine whether the weight of the evidence is accumulating towards the need for behavior change (Miller, 1999). A limited number of studies have used a guided, open-ended decisional balance as an intervention tool, but the results of guided interventions have been mixed with regard to alcohol use outcomes (Carey, Carey, Maisto, & Henson, 2006; S. E. Collins & Carey, 2005; LaBrie, Pedersen, Earlywine, & Olsen, 2006).

Alternatively, the data generated in a decisional balance could reflect resolve to enter into a course of action (Janis & Mann, 1977), thus serving as a proxy for motivation to change. This idea was echoed in the work of DiClemente and colleagues (e.g., DiClemente et al., 1991), who have since recognized decisional balance as a marker for the initiation of different stages of change (Pollak, Carbonari, DiClemente, Niemann, & Mullen, 1998). In fact, the stages of change have been operationalized algorithmically as a function of change in the decisional balance (Hall & Rossi, 2008; Prochaska, 1994). Thus, the historical development of the decisional balance construct shows its potential to both enhance and reflect people's motivational states. In this study, we focus on the role of decisional balance as an assessment tool rather than as an intervention procedure.

The existence of a relationship between decisional balance and motivation to change is evident; however, the nature of this relationship has been described differently in different theoretical contexts. Further, *how* decisional balance is measured has included the consideration of the pros and cons of a behavior and/or the pros and cons of an alternative behavior. *What* exactly decisional balance measures, however, has been less clearly defined. For example, some researchers have asserted that it represents the decision-making process itself (Fischhoff & Quadrel, 1991; Janis & Mann, 1977), others have posited that it represents one dimension of motivation to change (Miller, 1999), and yet others have suggested it is a covariate or perhaps mechanism involved in transitioning through various stages of behavior change (Prochaska et al., 1994). Considering the ambiguity in the relationship between motivation and decisional balance, more research is needed to establish the validity and clinical utility of decisional balance as a measure of motivation to change.

Decisional Balance Measures

Reflecting the ambiguity surrounding the decisional balance construct, several decisional balance measures for drinking have been designed over the past two decades. The Alcohol Decisional Balance Scale (ADBS) assesses the pros and cons of *maintaining* one's current alcohol use using a 42-item Likert-scale questionnaire (King & DiClemente, 1993). The Alcohol and Drug Consequences Questionnaire (ADCQ) is a 28-item, six-point Likert scale questionnaire designed to assess the pros and cons of *changing* alcohol or drug behavior (Cunningham, Gavin, Sobell, Sobell, & Breslin, 1997). Finally, the "decisional balance for immoderate drinking" was developed for college students (Migneault, Velicer, Prochaska, & Stevenson, 1999). This measure consists of 25, five-point Likert scale questions assessing the importance of selected pros and cons of "immoderate" drinking. Different sets of these original 25 items may be summed to form either 2, 20-item scales (pros versus cons of immoderate drinking) or 3, 18-item scales (pros, potential cons and actual cons).

Despite initially promising psychometric evaluations of these questionnaires, conceptual weaknesses can be identified. First, all of these measures have focused exclusively on the pros and cons of current drinking *or* the pros and cons of reducing or changing drinking, which precludes the evaluation of the decisional balance as a whole. An incomplete decisional balance has been viewed as problematic in decision-making theory because of the potential for

overlooked consequences to create new ambivalence after a decision has been reached (Janis & Mann, 1977). Similarly, an incomplete measure of decisional balance may fail to take into account all aspects of a person's current motivation to change. One empirical study found that consideration of both the target behavior and an alternative behavior nearly doubled the number of pros and cons spontaneously produced across multiple risky behaviors (Beyth-Marom, Austin, Fischhoff, Palmgren, & Jacobs-Quadrel, 1992). Particularly among adolescents in that study, negative social consequences were reported more often in assessing the cons of *not* drinking. Thus, a focus on only one-half of the decision-making process (i.e., either the pros and cons of current *or* alternative behavior) might lead to an incomplete and potentially less predictive measure of decisional balance.

Another problem with decisional balance measures to date is that the pros and cons are generated by researchers instead of by participants themselves. This approach may be inadequate in capturing motivation to change authentically and accurately. First, if researchers approach the topic from an academic perspective, they may identify different pros and cons of current drinking versus drinking behavior change than participants (Fischhoff & Quadrel, 1991). Also, the language used by researchers to describe the pros and cons can, in and of itself, influence participants' interpretation of the item and thus the participants' answers (Beyth-Marom et al., 1992; Fischhoff & Quadrel, 1991). On a related point, in providing participants with the "correct" pros and cons of drinking, researchers may be artificially constructing the decision-making process to which participants passively respond. This approach may have the unwanted side effect of making respondents aware of pros and cons they may not have otherwise considered and which may not represent their own unique decision-making process. In contrast, use of an open-ended response format allows participants to express their actual motivational state rather than respond to researchers' perspectives and values (Fischhoff & Quadrel, 1991).

In light of these concerns, it is plausible that an open-ended, participant-generated decisional balance could provide a more accurate measure of motivation to change and better predict drinking outcomes among college drinkers. In an exploratory analysis, Collins and Carey (2005) presented some evidence that, when used as an assessment of motivation, the pattern of responses generated during a decisional balance exercise predicted drinking outcomes with modest success. Specifically, among participants receiving an in-person decisional balance exercise, a greater proportion of pros to cons of changing one's drinking predicted short-term drinking outcomes.

Current Study

The current study was designed to extend these preliminary findings and examine an expanded, open-ended, four-field decisional balance worksheet as a measure of motivation to change drinking among at-risk college drinkers. The decisional balance worksheet prompted respondents to report the pros and cons of their current drinking versus reduced drinking. Next, the number of pros and cons reported in each field was converted into a proportion representing the decisional balance towards change or the decisional balance proportion (DBP).

The goal of this study was to test the validity of the DBP as a new measure of motivation to change drinking. We hypothesized that the DBP would evince convergent validity by positively correlating with an alternate, Likert scale measure of readiness to change, and positively correlating with the cons and negatively correlating with the pros of drinking as measured by continuous decisional balance scales. Further, we hypothesized that the DBP would evince discriminant validity by showing nonsignificant correlations with measures assessing dissimilar constructs (i.e., social desirability and demographic variables). Finally, we hypothesized that DBP change scores would evince predictive validity. Initial increases in the decisional balance reflecting movement towards drinking behavior change would predict

greater decreases in heavy drinking indices over the follow-up period compared to a DBP reflecting no movement or movement away from change.

Method

Participants

Participants consisted of 143 undergraduate volunteers who had participated in a randomized clinical trial of two types of brief motivational interventions (see Carey et al., 2006). Inclusion criteria for this trial were a) reporting ≥ 1 heavy drinking episode in an average week or ≥ 4 heavy drinking episodes in the last month; b) being 18-25 years of age; c) being a freshman, sophomore or junior in college; and d) consenting to participate. Only students who had participated in the first year of the larger study were included in the current secondary analyses because the format of the original measure was changed after the first year. The new format allowed for electronic data scanning, but as a consequence, limited the number of potential entries. Because the number of entries in each field of the decisional balance is the primary focus of the current study, the dataset includes only the participants who had the opportunity to respond to the unrestricted format.

The subsample of 143 students in the current study was predominately female (68%, $n = 97$), and the average age was 19.20 years ($SD = .87$). The sample consisted of 65% freshmen, 27% sophomores, and 7% juniors. The majority self-identified as White (87%), whereas 2% self-identified as Black/African American, 5% as Asian/Pacific Islander, 3% as Hispanic/Latino/a, and 4% as “Other” or Multiracial. Membership in a fraternity or sorority was reported by 24% of the sample, and most participants reported living on-campus (89%) or in a fraternity or sorority house (2%), as opposed to off-campus (8%).

Measures

A set of demographic questions assessed participants' age, gender, year in college, ethnicity, on- or off-campus residence, and membership in an on-campus Greek organization. Social desirability was measured using a 13-item short form of the Marlowe Crowne Social Desirability Scale (Reynolds, 1982). The alpha in the current sample was adequate ($\alpha = .63$).

The Decisional Balance Worksheet was modeled after a scale used to assess the accessibility of alcohol expectancies (see Stacy, Leigh, & Weingardt, 1994). Because it is a free recall task, it was administered prior to other Likert scale measures of decisional balance. Participants recorded each “advantage” and “disadvantage” of “continuing to drink as you are now” and “drinking less than you do now” on pre-numbered lines on the open-ended decisional balance worksheet. The counts of the pros and cons were obtained by summing the pre-numbered lines filled in by participants and formed the main explanatory variable for this study, the decisional balance proportion (DBP), which may be written:

$$\frac{Pros_{red} + Cons_{cur}}{Pros_{red} + Cons_{cur} + Pros_{cur} + Cons_{red}}$$

where subscripts *red* = reducing drinking and *cur* = current drinking. DBP scores at 0.5 represent an even balance between pros and cons of reducing drinking and current drinking. Scores between 0.5-1.0 indicate a balance tipped towards reducing drinking, and DBP scores between 0.0-0.5 indicate a balance tipped towards maintenance of current drinking. In the current study, baseline DBP was used in the convergent and discriminant validity tests, whereas change in the DBP from baseline to 1-month follow-up was used in predictive validity tests.

The 12-item Readiness to Change Questionnaire (RTCQ; Rollnick, Heather, Gold, & Hall, 1992) was scored as a continuous measure of readiness to change (Budd & Rollnick, 1996). The RTCQ was used in convergent and predictive validity analyses in the current study. The alpha reached an adequate level of item consistency ($\alpha = .80$).

The Decisional Balance for Immoderate Drinking (DBID; Migneault et al., 1999) is a 25-item Likert scale measure developed for college students. Different sets of these original 25 items may be summed to form either two scales (10-item pros versus 10-item cons of immoderate drinking) or three scales (10-item pros, 3-item potential cons, and 5-item actual cons). The 18-item, three-factor solution was used in tests of convergent and predictive validity in the current study. In the overall sample, reliability was calculated for pros ($\alpha = .81$), potential cons ($\alpha = .71$), and actual cons ($\alpha = .52$).

All drinking assessments used the previous 30 days as a uniform time frame and defined a drink as a 10–12 oz can or bottle of 4%–5% beer, a 4 oz glass of 12% table wine, a 12 oz bottle or can of wine cooler, or a 1.25 oz shot of 80 proof liquor either straight or in a mixed drink. A modified version of the Daily Drinking Questionnaire (R. L. Collins, Parks, & Marlatt, 1985) allowed for calculation of drinking frequency and quantity per heaviest drinking week. Using this measure, participants also estimated the frequency of heavy episodic drinking (HED), defined as five or more drinks for men and four or more drinks for women on one occasion (Wechsler et al., 2002). This measure yielded three of the alcohol outcome variables.

The *Rutgers Alcohol Problem Index* (RAPI; White & Labouvie, 1989) consists of 23 items assessing alcohol-related problems and was specifically developed for use with adolescents and young adults. Participants used a Likert scale to indicate how many times in the past 30 days they experienced each problem listed (i.e., 0 = 0 times, 1 = 1–2 times, 2 = 3–5 times, 3 = 6–10 times, 4 = more than 10 times), and a summary score represented severity of problems. Adequate internal consistency was obtained in the overall sample ($\alpha = .82$).

Procedure

Participants attending group baseline sessions provided informed consent and completed the measures mentioned above; all received course credit for their participation. Those who reported engaging in HED at least four times in the past month, were invited via telephone to participate in a randomized clinical trial which included various brief intervention and assessment conditions (for details, see Carey et al., 2006). Following the intervention period, participants were invited to attend 1-, 6- and 12-month in-person, follow-up assessments for which they filled out the same questionnaires and received course credit, \$20 and \$25, respectively.

Results

Preliminary Data Analysis

The distributions of the explanatory and outcome variables were examined for univariate outliers and deviation from the expected distributions. All drinking outcome measures were positively skewed count variables that approximated the negative binomial distribution. There were no extreme univariate outliers (see Table 1 for all means and standard deviations).

Convergent Validity

In order to determine the convergent validity of the DBP, bivariate Spearman correlations were conducted between the baseline DBP and baseline summary scores for the RTCQ, DBID-pros, DBID-potential cons, and DBID-actual cons. Although the correlations with the DBP were all

in the expected directions, only the correlations between the DBP and RTCQ and DBID-actual cons were statistically significant (see Table 2 for correlations).

Discriminant Validity

Bivariate Spearman correlations and Mann-Whitney U tests were conducted to test the hypothesized lack of association between the baseline DBP and gender $U(N=143) = -.26, p = .80$, race/ethnicity $U(N = 143) = -1.32, p = .19$, housing situation $U(N = 142) = .78, p = .44$, social desirability ($\rho = -.09, p = .28$), age ($\rho = -.12, p = .14$), and Greek membership, $U(N=143) = -1.03, p = .30$. As all tests were nonsignificant, discriminant validity of this measure was supported.

Predictive Validity of Change in Decisional Balance

Analysis plan—Population-averaged generalized estimating equation (PA-GEE; Zeger & Liang, 1986) models were conducted using STATA 10 (StataCorp, 2007) and tested the change in DBP from baseline to 1-month follow-up as a predictor of heavy drinking outcomes over the 12-month follow-up period. For those unfamiliar with PA-GEE models, they may be conceptualized as marginal regression models that can be applied to data conforming to different types of distributions (e.g., normal, Poisson, negative binomial, binomial) and can take into account nonindependence resulting from data clustering (e.g., longitudinal data collected on one participant).

The outcome variables were based on a time frame of the previous 30 days and included drinking quantity and frequency during heaviest drinking week, HED frequency, and RAPI score. Because the distributions of the drinking outcome variables were positively skewed, and the variables were typically overdispersed count/integer responses (e.g., number of drinks consumed during the heaviest drinking week), negative binomial distributions were specified (cf. Neal & Simons, 2007). To enhance interpretability of the regression coefficients, the log link was used for these models. For all variables, repeated measures on one case served as the clustering variable. Because the drinking outcome variables were longitudinal, unevenly spaced and variably correlated, an unspecified correlation structure was used (Hardin & Hilbe, 2003). The unspecified correlation structure allowed for the overall correlation between the substance use data at each time point to be taken into account in the overall model estimation.

Three separate models for each of the drinking outcome variables were used to test the relative predictive abilities of DBP, RTCQ and DBID change scores. The DBP models included five predictors: a linear time variable that compared drinking outcomes at baseline, 1-, 6-, and 12-month follow-ups (coded as 0, 1, 6 and 12, respectively); a quadratic time variable, which took into account the fact that alcohol use over time often follows a curvilinear versus a straight linear path; the DBP change score, which reflected movement in the balance towards or away from change (1-month follow-up minus baseline DBP); and both linear and quadratic time $\times$ DBP interactions. Similar, but nonnested models involving change on the RTCQ scale and on the three DBID scales were also run and were subsequently compared on goodness of fit using the quasiliikelihood under the independence model information criterion (QICu; Hardin & Hilbe, 2003). Similar to the Akaike's Information Criterion (AIC) tests, statistically superior models have the lowest QICu scores (Hardin & Hilbe, 2003).

Quantity: heaviest drinking week—The DBP model (QICu = 5124.78) for quantity during the heaviest drinking week was significant, Wald $\chi^2(5, N = 143) = 14.16, p = .01$, and statistically superior to both the RTCQ (QICu = 14458.37) and DBID (QICu = 17711.27) models. After controlling for time and baseline DBP, there were significant linear time $\times$ DBP ($IRR = .78, SE = .07, p = .006$) and quadratic time $\times$ DBP interactions ($IRR = 1.02, SE = .007, p = .007$). As shown in Figure 1, all participants seemed to decrease their heavy drinking

quantity between baseline and 1-month follow-up, possibly as a result of assessment reactivity. However, increases in DBP scores over the initial one-month period predicted subsequent decreases in drinking quantity at the 6-month follow-up-- an effect which decayed by the 12-month follow-up. Decreasing DBP scores tended to predict an increase in drinking quantity, which was followed by a reduction at the 12-month follow-up. On the other hand, relatively stable DBPs were associated with little change in drinking quantity.

Frequency: heaviest drinking week—The DBP model ($QICu = 343.23$) for frequency during the heaviest drinking week was statistically superior to both the RTCQ ($QICu = 1100.58$) and DBID ($QICu = 1280.73$) models, and was significant, Wald $\chi^2(5, N = 143) = 15.36, p = .009$. After controlling for time and baseline DBP, there were significant linear time $\times$ DPB ($IRR = .84, SE = .05, p = .003$) and quadratic time $\times$ DPB interactions ($IRR = 1.01, SE = .005, p = .005$). After all groups initially decreased on heavy-drinking frequency, increasing DBP over the initial one-month period predicted greater decreases in drinking frequency during the heaviest drinking week—until the 12-month follow-up when this decreasing effect decayed (see Figure 2). Decreasing DBP scores tended to predict increases in drinking frequency up to the 6-month time point followed by a reduction at the 12-month follow-up. On the other hand, relatively stable DBPs were associated with little change in drinking frequency.

HED—The best model according to the $QICu$ was the DPB model ($QICu = 1481.03$) compared to the RTCQ ($QICu = 4069.71$) and DBID ($QICu = 4891.80$) models; however, none of the omnibus model tests for HED outcomes were significant (all $ps > .18$).

RAPI—Compared to the RTCQ ($QICu = 5375.68$) and DBID ($QICu = 6493.62$) models, the DBP ($QICu = 1975.94$) model provided the best fit for self-reported alcohol-related problems, Wald $\chi^2(5, N = 143) = 13.12, p = .02$. After controlling for time and baseline DBP, there was a significant linear time $\times$ DPB interaction ($IRR = .85, SE = .07, p = .046$). As shown in Figure 3, all participants reported initial decreases in RAPI. Increases in DBP over the initial one-month period, however, predicted a stable linear decrease in alcohol-related problems over the follow-up period. On the other hand, decreasing DBP scores tended to predict increases on alcohol-related problems up to the 6-month time point followed by a downward trend at the 12-month follow-up. On the other hand, relatively stable DBPs are associated with relatively stable experience of alcohol-related problems.

Discussion

This study provided an examination of a decisional balance proportion (DBP) as a measure of motivation to change among at-risk college drinkers. The DBP was generated from responses to an open-ended decisional balance worksheet assessing pros and cons of current drinking versus reducing drinking; it was constructed to reflect the extent to which the decisional balance was tipped towards change.

Convergent validity of the DBP was partially supported in this study. As predicted, initial DBP positively and significantly correlated with readiness to change as measured by the RTCQ. This finding provided convergent validity for the DBP as a measure of motivation to change. Further, the weighted importance of current negative outcomes (DBID-actual cons) in participants' decisions to drink, was significantly, albeit weakly, associated with DBP scores. The somewhat weak effect may indicate that the DBID and the DBP measure overlapping yet distinct constructs, or it may reflect the relatively low reliability of the DBID-actual cons scale. The latter point is a psychometric issue that may have limited the power to optimally assess convergent validity with this scale.

The DBP was not significantly correlated with the pros scale of the DBID, which taps into the importance of positive aspects of “immoderate” drinking (e.g., “I feel happier when I drink”). However, this nonsignificant correlation is understandable: the DBP was constructed to reflect the tilt of the decisional balance towards change -- not the status quo. In fact, the DBP represents the weight of the cons of current drinking plus the pros of changing relative to all fields in the balance. Because this proportion does not explicitly highlight the pros of current drinking, they may be “passively” outweighed.

The fact that the DBP was not correlated with the DBID-potential cons scale reflects the mixed findings regarding convergent validity of the DBP. However, this lack of association may also be interpreted in the context of the cognitive and memory literature, which asserts that individual drinking experience influences the accessibility of certain thoughts about alcohol use. Specifically, frequently encountered outcomes, such as those represented by the DBID-actual cons scale (e.g., “Drinking makes me feel out of control”), may be more accessible than hypothetical, potential outcomes, such as those measured by the DBID-potential cons scale (e.g., “Drinking could kill me”) (Stacy et al., 1994). On the other hand, the DBP, which reflects an open-ended assessment of the decisional balance, may be even more accurate in assessing the most personally salient pros and cons of a behavior and may be more reflective of an individual's current motivational state than the DBID scales.

Evidence for the discriminant validity of the DBP was obtained. Our findings confirmed that the DBP did not significantly correlate with demographic measures (i.e., gender, race/ethnicity, year in college, greek membership, age) or social desirability. Perusal of the recent literature reveals no studies involving college students that have demonstrated associations between motivation and basic demographic variables or social desirability. Thus, consistent with empirical precedent and theory, the DBP appears to be an independent construct that may be used with a range of college students.

Findings in this study revealed that changes in the DBP predicted heavy drinking outcomes among at-risk college drinkers. In fact, the DBP models fit the data better than did models including RTCQ and DBID change scores as predictors of alcohol use over time. Further, the DBP models were the only ones that yielded consistently significant predictors of drinking outcomes. Across three of the four drinking outcome variables, movement towards change (i.e., an increase in proportion of pros of reduced drinking and cons of current drinking to total item count from baseline to 1-month follow-up) predicted reductions in drinking over the initial follow-up period.

However, this finding was tempered by a curvilinear effect on two of the four drinking outcome variables, drinking quantity and frequency, which complicated the initial linear findings. After participants with increasing motivation to change initially decreased their heavy drinking quantity and frequency (and vice versa), there was an apparent decay in this effect at the 12-month follow-up. This regression to the mean, however, does not necessarily indicate that the DBP does not predict drinking as hypothesized. It is highly possible that the relatively short-term changes in the DBP that occurred initially from baseline to one-month posttest may be most helpful in predicting more proximal changes in drinking. Thus, the more distal drinking measured one year after the initial motivation ratings may not be as reliably predicted by the DBP. This explanation fits with the literature on motivation which suggests that motivation to change drinking is a fluid state rather than a stable trait (Miller, 1999). It also corresponds to the developmental literature that documents temporal variation in college student drinking patterns over weeks and years (Del Boca, Darkes, Greenbaum, & Goldman, 2004; Schulenberg, O'Malley, Bachman, Wadsworth, & Johnston, 1996). Further studies are needed to establish the temporal robustness of changes in motivation as measured by the DBP. Perhaps models

assessing the time-varying and parallel change in DBP and drinking would help best ascertain this measure's ability to predict drinking.

Conceptually, the DBP corresponds to decisional balance and motivation to change theory better than the other measures (i.e., RTCQ and DBID) tested as predictors in this study. Unlike previous studies involving decisional balance measures (e.g., Cunningham et al., 1997; King & DiClemente, 1993; Migneault et al., 1999; Velicer, DiClemente, Prochaska, & Brandenburg, 1985), the DBP integrates all four fields of the decisional balance: the pros and cons of both current drinking *and* drinking reduction. Because both theory and empirical findings have indicated that the consideration of the pros and cons of both current behavior as well as behavior change are key to accurate assessment of a person's current motivation to change (Beyth-Marom et al., 1992; Janis & Mann, 1977), the use of the decisional balance worksheet may represent a step forward in decisional balance measurement. Further, the fact that the input for the DBP is participant- instead of researcher-generated may make this measure a more accurate and personally relevant representation of one's motivation to change than the RTCQ and DBID (Fischhoff & Quadrel, 1991). Finally, the open-ended format of the decisional balance worksheet lends itself to potential qualitative as well as quantitative representations of motivation to change.

Limitations

This study comprised a nonrandom sample of at-risk college drinkers who had participated in a larger intervention trial. Considering the potential confounding effects of the nonrandom selection and exposure to brief interventions, it is necessary to replicate these results on a larger, randomly selected, nontreatment sample. Further, the relatively homogenous racial and ethnic composition of the current sample raises questions as to the external validity of the current findings. This sample consisted of predominantly White, non-Hispanic students; thus, further study of the DBP and its ability to predict drinking outcomes in more diverse samples is necessary to ensure its generalizability to other populations. We also recognize that the DBP focuses on numbers of items generated rather than their content. Although potential information may be gained by considering item content as well, the DBP has the advantage of rapid and reliable scoring. Despite these limitations, the current results provide additional support for and expansion on a quantification of a drinking decisional balance originally introduced by Collins and Carey (2005).

Conclusions

This study provided evidence for the convergent, discriminant and predictive validity of a new decisional balance measure of motivation to change drinking behavior among at-risk college drinkers. This study adds to the literature because previous conceptualizations of the decisional balance measure were researcher- instead of participant-generated and were limited in their scope (i.e., assessed either pros and cons of drinking *or* of changing behavior but not both). Further, this measure appears to predict longitudinal drinking better than established, Likert-scale measures of readiness to change and decisional balance. Larger-scale studies should be conducted to provide additional support for the psychometric integrity, clinical utility and generalizability of this decisional balance measure.

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Figure 1.

Graph of mean quantity per heaviest drinking week by time point and level of change in DBP. The DBP change scores represent change in the DBP between baseline and the one-month follow-up. For clarity of presentation, groups were formed to represent different levels of change in the DBP. The stable DBP group in the figure is centered on the mean DBP change score ($M = -.004$, $SD = .20$) in this sample and includes difference scores ranging from $-.20$ to $.20$. These scores correspond to one SD below and one SD above the mean, respectively. The decreasing DBP group represents participants whose DBP change scores were at least one SD below the mean ($DBP < -.20$), and the increasing DBP group represents participants whose DBP change scores were at least one SD above the mean ($DBP > .20$).

Figure 2.
Graph of mean frequency per heaviest drinking week by time point and level of change in DBP.

Figure 3.
Graph of mean alcohol-related problems (RAPI score) by time point and level of change in DBP.

Table 1
Descriptive Statistics for Explanatory and Response Variables (N=143)

Variables	Baseline <i>M</i> (<i>SD</i>)	1-mo F-U <i>M</i> (<i>SD</i>)	6-mo F-U <i>M</i> (<i>SD</i>)	12-mo F-U <i>M</i> (<i>SD</i>)
Quantity: heaviest drinking wk	23.61 (13.96)	20.56 (18.34)	23.48 (18.12)	21.69 (16.86)
Frequency: heaviest drinking wk	3.35 (1.29)	3.08 (1.59)	3.43 (1.59)	3.35 (1.76)
HED frequency	6.69 (4.17)	5.33 (4.48)	6.82 (5.01)	5.92 (4.83)
RAPI score	7.55 (6.29)	6.00 (5.51)	7.26 (6.47)	5.97 (6.29)
DBP	.52 (.18)	.52 (.16)		

Note. HED= heavy episodic drinking. RAPI = Rutgers Alcohol Problem Index. DBP = decisional balance proportion.

Table 2
Bivariate Correlations Between the DBP, RTCQ and DBID Scales

Measure	1	2	3	4
1. DBP	--			
2. RTCQ total	.29 ^a	--		
3. DBID-Pros	-.15	.004	--	
4. DBID-potential cons	.08	.14	.20 ^a	--
5. DBID-actual cons	.17 ^a	.18	.27 ^a	.40 ^a

^aNotes. correlation significant at the $\alpha < .05$. DBP = Decisional balance proportion; RTCQ = Readiness-to-change Questionnaire. DBID = Decisional balance for immoderate drinking.