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Examining a curvilinear model of readiness to change and alcohol consumption

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Abstract

Research examining the relationship between readiness to change and alcohol consumption among college students is inconsistent. The purpose of the present study was to extend these findings, using two different measures of readiness to change. We hypothesized a curvilinear effect would occur such that the relationship between readiness to change and alcohol use would be relatively low for students low and high on readiness to change, whereas the relationship would be relatively high for those with moderate levels of readiness to change. Data were collected from two studies: Study 1 consisted of 263 undergraduate students and Study 2 consisted of 245 undergraduates participating in either intercollegiate or recreational athletics at three US universities. In Study 1, we examined the association between both linear and quadratic scores on a readiness to change measure and alcohol use. In Study 2, we examined the relationship between scores on a stage of change measure that included subscales indicative of different levels of readiness to change and alcohol use. The pattern of relationships supported the existence of an effect where the highest levels of alcohol use occurred among those with scores representing moderate levels of readiness to change.

Keywords

Readiness to change; alcohol; college students

INTRODUCTION

Heavy alcohol use has been considered the primary public health concern among college students (Wechsler, Lee, Kuo, & Lee, 2000). Almost 80% of college students consume alcohol and approximately 20% meet diagnostic criteria for an alcohol use disorder (Dawson, Grant, Stinson, & Chou, 2004; O'Malley & Johnson, 2002). Rates of binge drinking (five or more drinks on an occasion for men, four or more drinks for women) among college students have been relatively stable over the past 15 years, with approximately 40% of the students reporting binge drinking at least once in the preceding two weeks (Johnston, O'Malley, Bachman, & Schulenberg, 2008; Wechsler et al., 2000). Furthermore, a number of studies have shown heavy drinking college students are more

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likely than other students to experience negative alcohol-related problems such as engaging in unsafe sex, experiencing academic impairment, operating a car while under the influence, engaging in an argument or fight, doing something that was later regretted, or experiencing legal problems (Vik, Culbertson, & Sellers, 2000; Wechsler et al., 2000). Each year, over 1800 students die from alcohol related injuries, almost 600,000 report injuries, and almost 700,000 physical assaults occur while under the influence of alcohol (Hingson, Zha, & Weitzman, 2009).

Given the problems associated with excessive alcohol consumption among college students, in an effort to reduce alcohol-related risks, it is important for researchers to identify factors associated with drinking in the college population. One such factor that has received attention in the overall alcohol treatment literature is readiness to change (Miller & Rollnick, 2002). In order to characterize readiness to change, Prochaska and DiClemente (1992) developed a model encompassing multiple stages of change: Precontemplation (i.e. the individual does not indicate any need for change), Contemplation (i.e. the individual has feelings of ambivalence towards change with a greater awareness of problems related to drinking), Preparation (i.e. the individual is ready for action but is not taking steps to change behavior), Action (i.e. the individual is actively taking steps to change behavior), and Maintenance (i.e. the individual is continuing in Action and is working to prevent a relapse). Readiness to change is characterized as a spiral model of change, in that change is not a linear process and people can freely move forward and backwards among the stages (Prochaska, DiClemente, & Norcross 1992). Particularly in motivational interviewing (MI)-based interventions, understanding an individual's readiness to change is considered an important component of treating excessive alcohol consumption (Miller & Rollnick, 2002; Prochaska et al., 1992; Rollnick, 1998).

Typically, researchers examine readiness to change in the context of clinical intervention studies. Theoretically, increasing readiness to change regarding one's alcohol use will result in subsequent reductions in drinking (i.e. mediate intervention effects), but a recent meta-analysis of MI-based interventions found treatments did not impact participants' readiness to change (Apodaca & Longabaugh, 2009). This finding is consistent with several studies specific to college students and other young adults showing readiness to change did not mediate MI-based intervention effects (Barnett et al., 2010; Borsari, Murphy, & Carey, 2009; Wood, Capone, Laforge, Erickson, & Brand, 2007). Research suggests readiness to change may moderate the effects of alcohol interventions, but the findings are somewhat contradictory. For example, one study found a motivational intervention to be most effective among individuals with an initially low readiness to change in regard to drinking behaviors (Barnett et al., 2010), whereas others found stronger effects among individuals high in readiness to change (Fromme & Corbin, 2004; Stein, Caviness, Anderson, Hebert, & Clarke, 2010). Taken together, these findings present a somewhat confusing picture regarding the relationship between readiness to change and alcohol use among college students.

Readiness to change may nonetheless be relevant to understand alcohol consumption among college students. Indeed, studies with college students have found increases in readiness to change across time were associated with reduced alcohol consumption (Murphy, Dennhardt, Skidmore, Martens, & McDevitt-Murphy, 2010; Wood et al., 2007). Examining readiness to change outside the context of clinical intervention studies may also prove useful. Knowing the level of a student's readiness to change could provide researchers and clinicians with information about the student's current and/or future drinking practices and negative alcohol-related outcomes, which differs from understanding how he or she might respond to a motivational intervention. In addition, examining the association between readiness to change and alcohol-related outcomes might also advance theory on the construct by

illustrating how different types or levels of readiness to change are associated with differing amounts of alcohol use or related problems.

A handful of studies have examined the relationship between readiness to change and alcohol use among college students outside the context of how readiness to change mediates or moderates intervention effects. Two studies found, as would be expected from readiness to change theory, higher levels of readiness to change were associated with less future drinking (Carey, Henson, Carey, & Maisto, 2007; Kaysen, Lee, LaBrie, & Tollison, 2009). Other studies, though, found either a positive association between readiness to change and alcohol use/problems (Harris, Walters, & Leahy, 2008) or higher alcohol consumption associated with lower motivation to change drinking (Barnett, Goldstein, Murphy, Colby, & Monti, 2006). Perhaps the most comprehensive study on the topic found cross-lagged effects between readiness to change and alcohol use over the course of a 24-month period: higher readiness to change was associated with higher levels of subsequent drinking, while higher levels of drinking were associated with higher levels of subsequent readiness to change (Collins, Logan, & Neighbors, 2010). Although such findings contradict readiness to change theory, the authors hypothesized the results could be attributed to a “hangover effect,” in that students had greater awareness of their alcohol consumption and therefore increased readiness to change. Additionally, the authors noted contextual and psychosocial factors (i.e. financial cost, sensation-seeking, coping, perceived norms) may moderate the finding that higher levels of readiness to change were associated with future drinking.

It is possible a non-linear relationship between readiness to change and alcohol use among college students better explains the association and provides a possible explanation for these contradictory findings. Specifically, a quadratic relationship may exist, where high levels of drinking occur among students who report moderate motivation to change and low levels of drinking occur among those either very high or very low in motivation to change. Some individuals low in motivation to change may simply not be drinking in an at-risk manner; in addition, many of those high in motivation to change may report low drinking levels due to actively attempting to curb their behavior. In contrast, moderate levels of readiness to change might reflect individuals who recognize their drinking is perhaps excessive and causing them some problems, but not actively taking steps to curb their behavior. This is consistent with the notion that those who consume more alcohol, and consequently experience more alcohol-related problems, have increased recognition of their problems and begin to think about changing their behavior (Williams et al., 2006).

Two prior studies suggested this pattern of a non-linear relationship might in fact exist (Shealy, Murphy, Borsari, & Correia, 2007; Vik et al., 2000). In both studies, students classified either in the precontemplation stage or in the action stage reported less alcohol use than those classified in the contemplation stage. However, in one study the differences between action and contemplation were not statistically significant due to a very small sample size (Shealy et al., 2007).

The purpose of the present two studies was to extend these findings by using two different measures of readiness to change. Examining two assessment instruments allowed us to determine if our hypothesized effects were consistent across different ways of assessing the construct, and therefore increased the generalizability of our findings. In Study 1 we measured readiness to change on a single continuum, and hypothesized a curvilinear effect would occur such that the relationship between readiness to change and alcohol use would be higher for those with medium levels of the construct versus those with low and high levels. In Study 2 we measured readiness to change in terms of scores on three distinct theoretical stages, namely precontemplation, contemplation, and action that represent elevating levels of readiness to change. We hypothesized that scores on the contemplation

subscale would have a stronger positive relationship with alcohol use than those on the precontemplation and action subscales, and that individuals categorized as being in the contemplation stage would report more alcohol use than those categorized as being in the precontemplation or action stages.

METHODS

Study 1

Participants—Participants were 263 undergraduate students from an urban, Southern University (73% women) who reported using alcohol in the past 30 days. Almost two-thirds (60.8%) were White, 32.7% African American, 3.4% Hispanic, 2.7% Asian/Asian American, 2.3% biracial, and 1.5 % “other.” The mean age of participants was 20.63 years ($SD = 4.62$). Almost half (47.3%) were freshman, 26.3% sophomore, 16% junior and 10.3% senior.

Measures

Readiness to change: The Contemplation Ladder (Becker, Maio, & Longabaugh, 1996; Biener & Abrams, 1991) was adapted from smoking cessation research and modified to assess motivation to change alcohol use. The single-item measure depicts 10 rungs of a ladder with anchor points labeled “no thought of changing” (ranking of 0), “think I need to consider changing someday” (ranking of 2), “think I should change but not quite ready” (ranking of 5), “starting to think about how to change my drinking pattern” (ranking of 8), and “taking action to change (i.e. cutting down)” (ranking of 10). Participants were asked to indicate their current stage of change. Studies have supported the convergent and concurrent validity of the measure (Amodei & Lamb, 2004; Slavet et al., 2006). It has been shown to be comparable to longer measures, such as the University of Rhode Island Change Assessment (URICA; McConaughy, DiClemente, Prochaska, & Velicer, 1989), in assessing motivation to change (Amodei & Lamb, 2004).

Alcohol use: The Daily Drinking Questionnaire (DDQ) (Collins, Parks, & Marlatt, 1985) assesses drinking using a calendar-based method and is a commonly used assessment in alcohol studies (e.g. Carey, Carey, Maisto, & Henson, 2006; Kivlahan, Marlatt, Fromme, Coppel, & Williams, 1990; Martens, Ferrier, & Cimini, 2007). Participants were provided definitions for a standard drink: a 12 oz beer (i.e. most bottled or canned beer), a 5 oz glass of wine (i.e. a regular-sized glass of wine), or a 1.25 oz (one shot) drink of hard alcohol. Participants reported estimated number of drinks they typically consumed on each day of the week during the past 30 days. For the present study, we calculated drinks per week estimate from the DDQ. We also assessed peak number of drinks on a single occasion in the past 30 days by asking participants to report the maximum number of drinks they had consumed on a single occasion.

Demographic measures: Participants reported demographic information such as gender, age, race/ethnicity and year in school.

Procedure—Participants were recruited from the psychology subject pool at the university where the study was initiated, and they received course credit for study participation (see Smith et al., 2010 for additional details). After signing up for the study, participants were directed to an online portal where they completed the study measures. Course credit was assigned after the participant exited the final survey, but choosing not to respond to items on the questionnaires had no bearing on receiving credit.

Data analysis—We used hierarchical multiple regression to examine the association between both linear and quadratic scores on the readiness to change ladder and alcohol use, after controlling for gender effects due to the well-documented relationship between gender and alcohol consumption (e.g. O'Malley & Johnston, 2002; Wechsler et al., 2000). Gender was entered on step one of the regression analyses, followed by readiness to change scores on step two, and the squared readiness to change scores on step three (which allows one to assess for a quadratic effect: Pedhazur, 1997). In order to address both overall and high-risk alcohol use, we conducted separate analyses on average number of drinks per week and peak number of drinks on one occasion in the past 30 days.

Results

Descriptive statistics: Average number of drinks per week in the sample was 8.24 ($SD = 9.31$), and average number of drinks on the peak drinking occasion in the past 30 days was 6.19 ($SD = 4.95$).

Regression analysis: Results of the regression analyses are presented in Table I. For both drinks per week ($\Delta R^2 = 0.07$, $p < 0.001$) and peak drinking ($\Delta R^2 = 0.10$, $p < 0.001$) there was a statistically significant quadratic effect, suggesting there was a curvilinear relationship between readiness to change and alcohol consumption. To illustrate the nature of this relationship, scatterplots, including a best fitting regression line, are presented in Figures 1 and 2. The lowest levels of alcohol use occurred among individuals with very low and very high readiness to change scores, whereas alcohol use was higher among those with moderate scores. To illustrate, mean number of drinks per week among those with low scores (0–2, $n = 177$) was 6.37; mean number of drinks per week among those with high scores (8–10, $n = 30$) was 8.17; and mean number of drinks per week among those with moderate scores (3–7, $n = 56$) was 14.19.

Discussion—The pattern of relationships between the individual readiness to change scores and alcohol use supports the existence of a curvilinear effect. Results suggest those at the high end of readiness to change, who may be taking active steps to change their behavior, drink less than those in the middle of the continuum. This finding is consistent with readiness to change theory, as those who report scores in the middle of the continuum recognize to some degree that their drinking may be excessive, but are ambivalent about making changes in their behavior. In contrast, those with higher readiness to change scores are likely to be taking active steps to curb their drinking, resulting in lower levels of alcohol use. Our findings also showed that those with low readiness to change scores were not heavy drinkers, and therefore generally uninterested in changing their behaviors.

Study 2

Participants—Participants were 245 college students from one of three colleges who (a) reported using alcohol in the past month and (b) participated in varsity or club/intramural athletics. These universities were chosen for data collection in the parent trial (Martens, Kilmer, Beck, & Zamboanga, 2010) due to investigator affiliation. The majority (73.4%) were female and white (86.9%), with other ethnicities as follows: 1.6% African American, 2.9% Hispanic, 3.7% Asian/Pacific Islander, and 4.9% “other.” The mean age of participants was 20.24 years ($SD = 1.86$). Year in school was relatively equal: 28.4% were freshman, 24.7% sophomore, 19.3% junior, and 27.6% senior.

Measures

Readiness to change: The Readiness to Change Questionnaire (RTCQ) (Rollnick, Heather, Gold, & Hall, 1992) is a 12-item measure designed to assess three stages of change in

regards to drinking: Precontemplation (e.g. “I don’t think I drink too much”), Contemplation (e.g. “Sometimes I think I should cut down on my drinking”), and Action (e.g. “I have just recently cut down on my drinking”). Each subscale contains four items. Responses are scored on a 5-point scale ranging from *strongly disagree* to *strongly agree*. Internal consistency estimates for Precontemplation have ranged from 0.43 to 0.69, estimates for Contemplation have ranged from 0.62 to 0.92, and estimates for Action have ranged from 0.64 to 0.80 (Borsari et al., 2009; Harris et al., 2008; Shealy et al., 2007). In the present study, internal consistency estimates were as follows: Precontemplation = 0.63, Contemplation = 0.74, Action = 0.84. Participants were categorized as falling into a specific stage based on their highest value among the three. In the case of a tie score the participant was classified into the state indicating greater readiness to change (Rollnick et al., 1992).

Alcohol use measures: Alcohol use was assessed in an identical manner as Study 1.

Demographic Measures: Participants were asked to complete similar demographics information as in Study 1 (i.e. gender, age, race/ethnicity).

Procedure—Full data collection procedures have been described elsewhere (Martens et al., 2010) and will only be summarized here. Potential participants in this study were undergraduate students participating in varsity, club, or intramural athletics at their respective universities. Email addresses were obtained for eligible students, who were sent invitations to participate in this study. The students who followed the link in the email invitations were transferred to a webpage containing the online consent form and study questionnaires. Participants received a \$20 gift card for completing the full battery of questionnaires.

Data analysis—We again used hierarchical multiple regression to examine the association between readiness to change and alcohol use, with separate analyses conducted on drinks per week and peak drinking in the past 30 days. Gender was entered as a covariate on step one, followed by the three readiness to change subscales (Precontemplation, Contemplation, and Action) on step two. A pattern of findings consistent with a linear readiness to change effect would be represented by an increase in the negative association between the readiness to change subscale and alcohol use as one progressed along the readiness to change continuum (i.e. Action scores would be associated with less drinking than Contemplation scores, which would in turn be associated with less drinking than Precontemplation scores). A pattern of findings consistent with a quadratic effect would be represented by stronger negative relationships with alcohol use among both Precontemplation and Action scores and a weaker negative or even positive association between Contemplation scores and alcohol use, because it would indicate that alcohol use did not vary in a uniform manner along the readiness to change continuum. However, it is important to note that such an inference is not identical to formal testing for a quadratic effect (see Section “Study 1”). Additionally, we used ANCOVA to examine the association between alcohol use and readiness to change stage classification, using gender as a covariate. Participants were assigned to a stage based on their highest individual subscale score, and analyses were conducted using both raw and standardized RTCQ subscale scores (Rollnick et al., 1992).

Results

Descriptive statistics: Average number of drinks per week in the sample was 9.64 ($SD = 10.08$), and average number of drinks on the peak drinking occasion in the past 30 days was 7.14 ($SD = 5.27$).

Relationship between RTCQ stage scores and alcohol use: Results of the regression analyses are presented in Table II. The three RTCQ subscales resulted in a statistically significant increase in variance accounted for on both drinks per week, $\Delta F(3,230) = 21.59$, $p < 0.001$, $\Delta R^2 = 0.17$ and peak drinking, $\Delta F(3,230) = 25.57$, $p < 0.001$, $\Delta R^2 = 0.20$. For both alcohol use measures, the semi-partial effects of Precontemplation and Action were negative ($\beta = -0.15$ to -0.28 , $p < 0.03$), whereas the semi-partial effects of Contemplation were positive ($\beta = 0.27$ – 0.34 , $p < 0.01$). Thus, findings suggest that after controlling for the effects of scores on the other readiness to change subscales, higher scores at the ends of the readiness to change continuum were associated with less alcohol use, while higher scores in the middle of the continuum were associated with more alcohol use.

Relationship between RTCQ stage classification and alcohol use: Results of the analyses comparing alcohol use among the three readiness to change classification stages are presented in Table III. When participants were classified via raw scores, there was a significant effect for both drinks per week, $F(2,238) = 10.68$, $p < 0.001$, $\eta^2 = 0.08$, and peak number of drinks, $F(2,238) = 11.61$, $p < 0.001$, $\eta^2 = 0.09$. Those classified as being in contemplation reported more alcohol use than those classified as being in precontemplation or action, although when classified via raw scores the cell size for contemplation was small ($n = 9$). A similar pattern of findings emerged for classifications based on standard scores, though, and cell sizes were more equivalent. There was again significant effects for both drinks per week, $F(2,238) = 14.03$, $p < 0.001$, $\eta^2 = 0.11$, and peak number of drinks, $F(2,238) = 18.67$, $p < 0.001$, $\eta^2 = 0.14$, with those in contemplation reporting more alcohol use than those in the other stages.

Discussion—As found in Study 1, results from Study 2 show high and low levels of readiness to change (i.e. higher scores on the Precontemplation and Action subscales, or being classified into either the precontemplation or action stage) to be associated with less alcohol use than a more moderate level of readiness to change. These findings suggest that individuals with ambivalence about changing consume the highest amount of alcohol. It should be noted this sample was composed of those participating in varsity or club/intramural athletics. Prior studies have shown male and female athletes consume more alcohol and experience more general alcohol-related problems than those not participating in athletics (Leichliter, Meilman, Presley, & Chasin, 1998; Nelson & Wechsler, 2001; Wechsler et al., 2000), but our findings suggest a similar pattern or relationships between readiness to change and alcohol consumption between an athlete-specific and general college student population (as seen in Section “Study 1”).

OVERALL DISCUSSION

The present findings sought to clarify inconsistencies in the literature regarding the relationship between readiness to change and alcohol consumption. While readiness to change has been previously characterized in a linear fashion, contradictory findings have emerged. For example, findings have shown increased drinking to be associated with increased readiness to change (Harris et al., 2008) while others have found it to be associated with lower readiness to change (Barnett et al., 2006). Consistent with our hypothesis, we found that students with moderate motivation to change engaged in high levels of drinking, whereas students with low or high motivation to change consumed less alcohol. By expanding on prior research that suggested a quadratic relationship (Shealy et al., 2007; Vik et al., 2000), we found evidence for such a relationship using larger sample sizes and two different measures of readiness to change. Results of Study 1 illustrated a curvilinear relationship between a continuous measure of readiness to change and alcohol consumption among a general college population. Likewise, results from Study 2 indicated high scores on the contemplation subscale, which represents the middle of the readiness to

change continuum, were associated with higher levels of alcohol consumption. In contrast, high scores on the precontemplation and action subscales, which represent the low and high ends of the readiness to change continuum, were associated with lower alcohol consumption. Further, students classified as being in the contemplation stage reported significantly more alcohol use than those classified as being in precontemplation or action.

The most direct clinical implication from the study is college students who report being ambivalent about changing their behavior (e.g. scoring at the midpoint of a continuous measure or reporting high scores on a measure of contemplation) are at-risk for excessive alcohol consumption relative to other students. Thus, clinicians working with college students who endorse ambivalent attitudes about changing their drinking behaviors should fully assess their consumption patterns and provide appropriate interventions as needed. Students ambivalent about changing their drinking behaviors may be prime candidates for brief motivational interventions, like the BASICS program (Dimeff, Baer, Kivlahan, & Marlatt, 1999; Marlatt et al., 1998), designed to resolve ambiguity about one's drinking behavior. Findings from the study suggest clinicians should not assume students endorsing low readiness to change drinking behaviors are engaging in at-risk drinking practices and/or are in some type of denial regarding their behaviors. Our results suggest such students are likely to be drinking at low levels, which likely do not require formal intervention. However, those students who are low in readiness to change and engaging in heavy alcohol use should of course be provided appropriate services. Additionally, gender emerged as a significant predictor of alcohol use in both studies, with men consuming significantly more alcohol than females. This finding has been well documented in the alcohol literature (O'Malley & Johnston, 2002).

There were limitations to this study. The cross-sectional nature of the data does not provide clear evidence regarding the directionality or causality of the relationships. Further, all data were self-report, although research generally supports the reliability and validity of self-report measures of alcohol use (e.g. Babor, Steinberg, Anton, & Del Boca, 2000; Borsari & Muellerleile, 2009). Finally, even though the studies were conducted independently at different universities, the generalizability of the findings is somewhat limited given the non-random nature of the samples.

Despite these limitations, we believe this study makes an interesting contribution to the college drinking literature. A similar pattern of relationships emerged between readiness to change and alcohol use between different samples using different measures of the construct. We encourage future researchers to expand upon the findings from the present study. For example, it would be useful to determine if there are characteristics besides alcohol use itself that distinguish low- versus high-risk drinkers who are low in readiness to change (e.g. alcohol problems, personality or genetic risk factors). It would also be useful, given the curvilinear relationship between readiness to change and alcohol use, if readiness to change measures could be incorporated as useful screening tools. In sum, we encourage researchers to continue to explore the relationship between readiness to change and alcohol-related use in novel and innovative ways.

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Figure 1.
Study 1 – Relationship between readiness to change scores and number of drinks consumed in a typical week during the past 30 days.

Figure 2.
Study 1 – Relationship between readiness to change scores and maximum number of drinks consumed in past 30 days in one sitting.

Table I

Study 1 – Regression results for Contemplation Ladder in predicting drinks per week and peak drinking.

Predictor	<i>B</i>	β	<i>t</i>	<i>d</i>
Drinks per week				
Step 1	3.88	0.19	3.05*	0.38
Gender				
Step 2	0.55	0.18	3.06*	0.38
Readiness to change scale				
Step 3	-0.28	-0.90	-4.56**	-0.56
Readiness to change quadratic				
Peak drinking				
Step 1	3.17	0.29	4.81**	0.59
Gender				
Step 2	0.21	0.13	2.18*	0.27
Readiness to change scale				
Step 3	-0.18	-1.05	-5.56**	-0.69
Readiness to change quadratic				

Notes: Cohen's *d* was calculated with the following formula: $d = 2 t / df$ (Rosenthal & Rosnow, 1991). By conventional criteria (e.g. Cohen, 1988) small, medium, and large effects are generally considered to be 0.2, 0.5, and 0.8, respectively.

* $p < 0.05$.

** $p < 0.001$.

Table II

Study 2 – Regression results for RTCQ subscales in predicting drinks per week and peak drinking.

Predictor	<i>B</i>	β	<i>t</i>	<i>d</i>
Drinks per week				
Step 1	−10.52	−0.46	−7.80**	−1.02
Gender				
Step 2				
Precontemplation	−1.01	−0.27	−4.22**	−0.56
Contemplation	0.90	0.28	3.59**	0.47
Action	−0.41	−0.16	−2.33*	−0.31
Peak drinking				
Step 1	−5.51	−0.45	−7.78**	−1.03
Gender				
Step 2				
Precontemplation	−0.51	−0.27	−4.17**	−0.55
Contemplation	0.59	0.36	4.60**	0.61
Action	−0.32	−0.24	−3.56**	−0.47

Notes: Refer to the footnote of Table I.

Table III

Study 2 – Adjusted means for raw and standardized RTCQ subscales.

Stage	Raw subscales			Standardized subscales		
	<i>n</i>	<i>M</i> (<i>SD</i>)	95% CI	<i>n</i>	<i>M</i> (<i>SD</i>)	95% CI
Drinks per week						
1	176	8.31 (0.66)	[7.00, 9.60]	109	6.69 (0.83)	[5.07, 8.32]
2	9	20.11 (2.91)	[14.38, 25.84]	72	13.61 (1.02)	[11.61, 15.61]
3	57	12.12 (1.16)	[9.94, 14.41]	61	10.23 (1.10)	[8.06, 12.39]
Peak drinking						
1	176	6.59 ^a (0.34)	[5.91, 7.27]	109	5.47 (0.42)	[4.63, 6.31]
2	9	13.90 (1.52)	[10.91, 16.89]	72	9.60 (0.52)	[8.57, 10.63]
3	57	7.75 ^a (0.61)	[6.56, 8.95]	61	7.21 (0.57)	[6.01, 8.33]

Notes:

^aDifferences among mean values were not statistically significant ($p > 0.05$). All other differences among mean values were statistically significant ($p < 0.05$).