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Which Heavy Drinking College Students Benefit from a Brief Motivational Intervention?

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Abstract

Heavy drinking among college students is common and is often harmful. A previously reported randomized trial revealed that a brief motivational intervention (BMI) reduced the alcohol consumption of heavy drinking college students (Carey, Carey, Maisto, & Henson, 2006). For this study, we conducted supplemental analyses of hypothesized predictors of change using the same sample ($N = 495$). Greater readiness-to-change, higher levels of self-regulation, and less engagement in social comparison all independently predicted reductions in drinking outcomes. Furthermore, self-regulation, social comparison, and future time perspective interacted with BMI and predicted drinks per week. As expected, greater self-regulation skills enhanced response to the BMI; the remaining interaction effects were unexpected. Overall, these findings suggest that BMIs produce relatively robust effects.

Keywords

brief intervention; college drinking; moderator; self-regulation; readiness-to-change

Ample evidence indicates that brief motivational interventions (BMIs) reduce risky alcohol use in college students (Walters & Neighbors, 2005). Although drinkers vary in their response to BMIs, despite this variability, moderators of intervention efficacy are seldom investigated (Dunn, Deroo, & Rivara, 2001). This lacunae merits attention because identifying students who are most likely to benefit can lead to better targeting of BMIs, and knowing those who show less benefit can inspire revision and improvement of interventions.

We reviewed the literature and identified six potential moderators of BMI efficacy. First, the evidence regarding the moderating role of *gender* has been mixed (Borsari & Carey, 2000; Murphy et al., 2004), indicating the need for continued research. Second, *readiness-to-change* may be related to outcomes. Fromme and Corbin (2004) reported that students reporting greater readiness-to-change drank less after an intervention compared to students in a control condition.

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Third, because reductions in perceived drinking norms mediate BMI outcomes (Borsari & Carey, 2000; Neighbors, Larimer, & Lewis, 2004), students who are more sensitive to normative information may find feedback most compelling. Therefore, we hypothesized that students who attend to *social comparison* information (Buunk, Gibbons, & Visser, 2002) may enhance their BMI outcomes. Fourth, researchers who use a BMI assume that recipients have the skills to change, once they develop the motivation to do so (Miller & Rollnick, 2002). Therefore, students who possess strong *self-regulation skills* should be better equipped to translate motivation into goal-directed action. Finally, generalized orientations to present and future are related to engaging in health risk behaviors, including alcohol use (Henson, Carey, Carey, & Maisto, 2006). We predicted that *present hedonistic time perspective* would be associated with less change and *future time perspective* might be associated with more change after a BMI.

To investigate the relationship of these moderators to response to a BMI, we used data from a recent intervention study with heavy drinking students (Carey, Carey et al., 2006). In that study, students who received a detailed assessment reduced their alcohol consumption relative to controls. Moreover, those who also received a basic BMI benefited even more than those who received just the detailed assessment; unexpectedly, the addition of a decisional balance module to the basic BMI did not improve outcomes. The risk reduction achieved by the basic BMI emerged at the one-month follow-up, and was maintained for 12 months.

In this study, we used supplemental analyses to identify predictors of observed intervention effects. Because the BMI had its greatest impact at one-month, dependent variables consist of baseline to one-month change for alcohol consumption and for related problems. We hypothesized that these baseline variables would be associated with greater BMI-related change: female gender, greater readiness-to-change, higher attention to social comparison, higher self-regulation, and lower present-hedonistic time perspective and higher future time perspective.

Method

Participants and Procedure

Participants were students enrolled in Introductory Psychology; during a screening session, they provided informed consent and completed a baseline survey. Students who reported (a) ≥ 1 episode of heavy drinking in an average week or ≥ 4 heavy drinking episodes in the last month; (b) age 18 to 25 years; and (c) freshman, sophomore, or junior standing were invited to meet individually with a Research Assistant (RA). The RA explained that students would be (a) randomly assigned to one of six conditions [i.e., a 2 (assessment: timeline-enhanced vs. standard) × 3 (intervention: control, basic BMI, BMI enhanced with decisional balance)], (b) asked to return for follow-up sessions, and (c) awarded course credit for participating. Interested students provided a second consent and contact information, and completed the timeline interview (if appropriate to their condition). Students assigned to an intervention condition met with a trained interventionist to receive their intervention. Follow-up assessments were conducted in private offices. Additional procedural details are available in Carey, Carey, et al. (2006).

The screening survey also assessed the six hypothesized moderators and the five outcome variables. Thus, students provided information regarding *gender*, age, race/ethnicity, residence, Greek affiliation, and height and weight. In addition, they completed the following measures.

The Readiness-to-Change Questionnaire (RTCQ; Rollnick, Heather, Gold, & Hall, 1992) assessed stage-of-change among drinkers with three 4-item subscales: precontemplation,

contemplation, and action. Responses were coded on a 5-point Likert scale. A continuous score (α = .85) representing *readiness-to-change* was derived (Budd & Rollnick, 1996).

The Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999) measured the extent to which individuals engage in *social comparison*. Eleven items (e.g., "If I want to learn more about something, I try to find out what others think") are rated on 5-point Likert scales (α = .86). Temporal stability ranged from .71 (3 weeks) to .60 (1 year) in the original sample (Gibbons & Buunk, 1999).

The Short Self-Regulation Questionnaire (SSRQ; Carey, Neal, & Collins, 2004) was used to obtain a single score that represents generalized *self-regulation capacity*. Thirty-one items (e.g., "I am able to accomplish goals I set for myself") were rated on 5-point Likert scales, and summed to create a total score. The SSRQ exhibited good internal consistency (α = .91).

The Zimbardo Time Perspective Inventory (Zimbardo & Boyd, 1999) yielded scores reflecting *present-hedonistic time perspective* (15 items; e.g., "I do things impulsively") and *future time perspective* (13 items; e.g., "I believe that a person's day should be planned ahead each morning"); both scales were internally consistent (αs = .80 and .81, respectively).

The survey also assessed five variables that represented typical drinking (drinks per week, drinks per drinking day), risky drinking (peak blood alcohol concentration [BAC], frequency of heavy drinking), and drinking problems, all for the past month. Responses to the modified version of the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985) were used to calculate (a) *drinks per typical week* and (b) *mean drinks per drinking day*. Students estimated the maximum number of drinks consumed in a single day and the number of hours spent drinking on that day to estimate (c) *peak BAC*. Students also completed a set of questions to determine frequency of heavy drinking (Wechsler, Davenport, Dowdall, Moeykens, & Rimm, 1995). Responses were used to calculate a gender-specific estimate of (d) *heavy drinking frequency*. The 23-item (e) *Rutgers Alcohol Problems Index* (RAPI; White & Labouvie, 1989) has been validated for adolescents and young adults. Students used a 5-point scale to indicate how often they have experienced problems in the last 30 days. RAPI total scores were internally consistent (α = .82).

Analysis Plan

Details of the outcome analyses were presented in Carey et al. (2006). Supplemental analyses reported herein determined if the hypothesized moderators measured at baseline predicted change in the outcome variables at the one-month follow-up, across intervention conditions as well as differentially by condition. We characterized outcomes as baseline to one-month change scores, where a negative score indicates decreased drinking behavior (or problems). Moderator effects were examined for each of the five outcome variables in five parallel analyses. Analyzing the outcomes separately provides concurrent validation across indicators of typical drinking, risky drinking, and alcohol-related consequences. Continuous predictors were grand-mean centered.

Our experimental design was a 3 (control, basic BMI, enhanced BMI) by 2 (timeline, no timeline) factorial design with 6 hypothesized moderators. We chose a modified hierarchical backward stepwise procedure that evaluated the change in the *F* statistic across nested models to identify the most parsimonious model while minimizing the number of models tested. The baseline model for each outcome initially specified the 27 experimental and hypothesized moderator relationships for the 2 experimental effects and 6 hypothesized moderators: 8 main effects, the BMI-by-timeline interaction, 6 BMI-by-moderator interactions, 6 timeline-by-moderator interactions, and 6 BMI-by-timeline-by-moderator (3-way) interactions.

The modified hierarchical backward stepwise procedure was conducted in four stages: the three-way interactions, timeline-by-moderator interactions, BMI-by-moderator interactions, and the main effects. Any effects involved in an interaction retained by the backward stepwise procedure were not subject to removal throughout subsequent stages. Finally, the BMI main effect, timeline main effect, and their interaction were not removed, to reflect the experimental design and to distinguish confirmatory results from the exploratory analyses.

Results

A total of 509 eligible and consenting students were randomized into conditions by gender. Nearly all (n = 495, or 97%) provided one-month data. Baseline data are reported in Table 1. Intervention conditions did not differ on any demographic or drinking variable. Overall, two-thirds of the sample was female, and approximately one-half were freshmen. Students consumed 20 drinks per week, with an average of seven heavy drinking days in the last month. The conditions did not differ on any of the moderators measured at baseline.

Table 2 contains correlations, variances, and covariances among the baseline outcome and moderator variables. Correlations among hypothesized moderators ranged from .00 to |.54|. The strongest relationship emerges between SSRQ and future time perspective, suggesting some overlap in these constructs. Notably, the low negative correlation between SSRQ and RTCQ (r = −.13) indicated that self-regulation is inversely associated with perceptions of the need to change.

Significant bivariate relationships were found between hypothesized moderators and baseline consumption and consequences. At baseline, *gender* was related to all consumption variables with males drinking more (and more frequently) but achieving significantly lower peak BACs than women. *Readiness-to-change* correlated significantly with all outcomes measured at baseline except drinks per drinking day. Thus, heavier drinking students reported higher readiness-to-change scores at baseline. Students with better *self regulation* skills tended to report fewer heavy drinking episodes and fewer alcohol-related problems. *Social comparison tendencies* (INCOM) were related only to baseline RAPI score; students who engaged in social comparison tended to report more consequences at baseline. *Future time perspective* was negatively related to drinks per week and RAPI score; in contrast, *present-hedonistic time perspective* was positively related to all drinking variables except drinks per day.

Table 3 summarizes the results of the moderation analyses. At least marginal main effects for BMI type were found for all five change scores. Standardized βs and 95% confidence intervals (CIs) in Table 4 reveal that students in both BMIs consumed fewer drinks per week at follow-up than student controls (M = −5.5, −4.9, and −2.5 drinks, respectively). Similarly, students who received either BMI reported greater reductions in heavy drinking episodes than did controls (Ms = −2.4, −2.0, and −1.0, respectively). In contrast, the basic BMI group reduced peak BAC more (M = −.06) than either the enhanced BMI or the control group (Ms = −.03, and −.02, respectively). Finally, only the basic group reduced RAPI scores (M = −1.8 versus −1.1 for enhanced and .02 for control). These analyses corroborate the findings reported previously using hierarchical linear modeling (Carey, Carey et al., 2006). Neither the timeline main effect nor the BMI-by-timeline interaction predicted one-month scores. Neither three-way interaction nor the timeline-by-moderator interactions were retained by the backward stepwise procedure.

None of the *gender* or *hedonistic time perspective* main or interaction effects contributed to the prediction of any of the outcomes after controlling for the other moderators. Therefore, the effects for these proposed moderators were dropped from the exploratory models.

Readiness-to-change exhibited a main effect for drinks per week, heavy drinking frequency, peak BAC, and alcohol-related problems. The marginally significant ($p = .09$) effect of readiness-to-change on drinks per drinking day was consistent with the pattern for the other outcomes. Across conditions, higher readiness-to-change predicted greater reductions from baseline to one-month. No interactions between readiness-to-change and intervention conditions were retained by the backward stepwise procedure.

Self-regulation was predictive of changes in drinks per drinking day as well as in peak BAC. These main effects indicate that individuals high in self-regulation reported larger decreases in drinks per drinking day, and were more likely to reduce their monthly peak BAC, regardless of intervention condition. The SSRQ effect for heavy drinking frequency was in the same direction ($p = .07$). A significant BMI-by-SSRQ interaction for drinks per week revealed that this negative relationship was significant only for the basic BMI condition, in contrast to the main effects on drinks per drinking day and peak BAC (see confidence intervals in Table 4).

Main effects of *social comparison* (i.e., INCOM scores) were observed for drinks per week and drinks per drinking day, indicating that people who make more social comparisons tended to exhibit smaller drinking reductions, averaged across all conditions. However, the main effect is qualified by a significant BMI-by-INCOM interaction for drinks per week; this pattern did not hold for students in the BMI intervention. As illustrated by the CIs in Table 4, INCOM scores were not related to changes in drinks per week in the basic BMI condition, suggesting that participation in a basic BMI nullified the adverse effects of engaging in more social comparison.

Future time perspective moderated the BMI effect on drinks per week and RAPI scores. In the control condition (i.e., in the absence of any BMI), participants high in future time perspective reduced more than those low in future time perspective. A similar but nonsignificant negative trend was seen for the enhanced BMI group. In contrast, a significant positive relationship was observed between future time perspective and drinks per week in the basic BMI condition: that is, students with low scores on future time perspective reduced their drinks per week more than students with higher scores in the basic BMI condition. For alcohol problems, future time perspective predicted RAPI scores only in the enhanced BMI condition (see Table 4).

Discussion

We sought to test whether six person variables would moderate the effect of a BMI. Overall, few of the hypothesized moderators were found to be influential. These results suggest that BMIs are relatively robust despite many individual differences inherent in students who receive these interventions. For example, we found no evidence that gender or present-hedonistic time perspective was related to outcome. The absence of gender moderation corroborates previous studies (Borsari & Carey, 2000, 2005; Marlatt et al., 1998) and confirms that the BMIs are equally efficacious for men and women.

Several person variables did influence drinking patterns and problems at follow-up, more often as main effects than as moderators. Readiness-to-change was a nonspecific predictor of drinking outcomes. Students with greater readiness-to-change at baseline were more likely to reduce their alcohol consumption and problems regardless of whether they participated in an intervention, a finding partially consistent with those of Fromme and Corbin (2004). In our heavy drinking sample, readiness-to-change was positively correlated with most baseline drinking variables. Because heavier drinkers with more problems are the most likely to express greater readiness-to-change, they drink less over time, even in the absence of an intervention.

Self-regulation predicted changes in drinks per day and peak BACs, but did not moderate the BMI effect on those outcomes. Rather, students with self-regulation skills reduced the number

of drinks consumed and achieved lower peak BACs at the follow-up, regardless of whether they received an intervention. For one outcome (drinks per week), self-regulation did potentiate the efficacy of the basic BMI. That is, strong self-regulators who participated in a basic BMI reduced drinks per week more than poor self-regulators. It is not clear why self-regulation would have a main effect on some consumption variables and demonstrate this pattern only in one BMI group for drinks per week. Perhaps good self-regulators made adjustments in response to participating in a study and completing assessments. Participation in a basic BMI focused attention on drinks per week repeatedly in the context of personalized feedback; perhaps this repetition prompted self-regulators to attend to their consumption patterns. In the enhanced BMI condition, the intrapersonally-oriented decisional balance activities that followed personalized feedback may have diluted attention to drinks per week.

Contrary to expectations, the measure of social comparison predicted alcohol consumption even in the absence of an intervention. In the control and enhanced BMI conditions, students who use social cues to guide behavior maintained or even increased consumption, whereas students less attuned to social comparison were more likely to reduce drinking. This pattern might be expected if social comparison caused participants to be more aware of exaggerated drinking norms and to increase their drinking as a consequence, consistent with theory (Perkins, 2003) and empirical findings (Carey, Borsari, Carey, & Maisto, 2006). In contrast, participation in a basic BMI essentially neutralized the risk enhancement associated with social comparison. Baseline level of social comparison was irrelevant for basic BMI participants, as all tended to reduce their drinking over time.

The role of social comparison tendencies was unexpected; we had hypothesized that social comparison would become relevant only when mobilized by the normative comparisons provided in the BMIs. We had not anticipated the social comparison effect on future drinking in the absence of an intervention. These results suggest that strong tendencies to engage in social comparison may increase the vulnerability of young adults to environments with elevated peer drinking norms. These findings suggest that prevention programs might incorporate discussions of the effects of using social comparison information on drinking decisions.

In the multivariate model, future time perspective did not evince a main effect on alcohol consumption or problems but it did interact with condition in unexpected ways. Individuals high in future time perspective are also conscientious, forward-looking, and able to delay gratification (Zimbardo & Boyd, 1999). Thus, it was not surprising to see that a negative relationship between future time perspective and drinks per week in the control condition. However, the relationship between future time perspective and drinking in the basic BMI condition was surprising: students lower in future time perspective changed more than their future-oriented counterparts after participating in a basic BMI. Perhaps this BMI encouraged students who would not normally think about the consequences of their drinking to do so. If this is an active ingredient of the basic BMI, then those students with less of a future time perspective had more to gain from the BMI. Additional research is needed to clarify the relevance of future time perspective for drinking.

Our results should be interpreted in a manner mindful of this study's limitations. First, use of a sample drawn from one university restricts generalizability. Second, we relied on self-report, a method that is vulnerable to self-presentation bias. Third, our exploratory multivariate approach may have limited sensitivity for detecting individual moderator effects. Nonetheless, these results provide reassurance regarding the use of BMIs with a variety of students. For example, tailoring to gender, beyond the personalization inherent in a BMI does not appear to be necessary. Moreover, BMIs can promote drinking reductions regardless of the student's initial readiness-to-change. This research identified one risk factor (tendency to engage in social comparison) and two protective factors (self-regulation abilities, future time perspective)

for college student drinking. Future research should explore the role of these factors on student responsiveness to BMIs.

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Table 1

Baseline demographics, drinking variables, and moderators for six study groups for participants who provided both Time 1 and Time 2 data (n = 495)

Variable	Timeline Conditions			No Timeline Conditions		
	Assessment only	Basic BMI	Enhanced BMI	Assessment only	Basic BMI	Enhanced BMI
Sample size	87	83	81	79	84	81
Gender: % Female[a]	67%	64%	64%	66%	64%	64%
Ethnicity: % White	86%	91%	92%	87%	90%	88%
Year: % Freshmen	54%	51%	58%	53%	51%	63%
Residence: % living on campus	86%	87%	88%	78%	88%	91%
Greek status: % Greek	20%	18%	17%	26%	26%	21%
Age (years)	19.3 (0.7)	19.3 (0.8)	19.2 (0.7)	19.2 (0.8)	19.3 (0.9)	19.0 (0.8)
Drinks per week	18.3 (8.9)	19.4 (12.4)	18.8 (13.2)	19.2 (11.2)	20.8 (16.0)	19.2 (13.0)
Drinks per drinking day	5.5 (2.3)	5.5 (2.2)	5.7 (2.5)	5.8 (2.6)	5.7 (3.4)	5.8 (3.3)
Heavy drinking days	6.9 (3.7)	7.4 (5.0)	6.7 (3.7)	7.7 (4.1)	7.6 (5.2)	7.0 (4.2)
Peak BAC	0.22 (0.09)	0.22 (0.09)	0.21 (0.09)	0.21 (0.09)	0.21 (0.09)	0.21 (0.09)
RAPI	7.7 (5.9)	7.9 (7.9)	6.6 (6.2)	8.3 (5.7)	6.6 (6.0)	7.3 (5.5)
RTC	20.1 (7.2)	19.0 (7.5)	19.0 (8.2)	19.0 (7.0)	18.0 (6.9)	19.4 (6.3)
INCOM	36.8 (8.1)	37.0 (7.8)	37.4 (8.6)	37.2 (7.2)	36.2 (8.7)	37.0 (8.0)
SSRQ	114.4 (12.8)	113.2 (12.7)	112.7 (13.2)	110.8 (14.1)	114.7 (16.0)	110.2 (13.9)
Future TP	3.6 (0.5)	3.6 (0.5)	3.5 (0.5)	3.6 (0.6)	3.5 (0.5)	3.5 (0.5)
Present-hedonistic TP	3.6 (0.4)	3.5 (0.4)	3.6 (0.5)	3.6 (0.4)	3.6 (0.5)	3.6 (0.4)

Note. Values indicate the means (and standard deviations) unless otherwise noted. Time 1 = baseline; Time 2 = 1 month; BMI = brief motivational intervention; BAC = blood alcohol concentration; RAPI = Rutgers Alcohol Problems Index; RTCQ = Readiness-to-Change Questionnaire; INCOM = Iowa-Netherlands Comparison Orientation Measure; SSRQ = Short Self-Regulation Questionnaire; TP = Time Perspective.

[a]Women were coded "1."

Table 2

The variances, covariances, and correlations among the 5 dependent variables measured at baseline and 6 covariates (N = 509).

	DPW	DDD	HDD	Peak BAC	RAPI	RTCQ	INCOM	Future TP	Hedonistic TP	SSRQ	Gender[a]
DPW	**158.53**	*25.89*	*30.68*	*0.41*	*21.78*	*0.76*	*−0.59*	*−0.72*	*0.67*	*−0.45*	*−1.73*
DDD	0.76**	**7.38**	*3.54*	*0.08*	*2.32*	*0.10*	*−0.15*	*−0.08*	*0.04*	*0.01*	*−0.39*
HDD	0.56**	0.30**	**19.11**	*0.14*	*9.71*	*0.25*	*0.08*	*−0.27*	*0 34*	*−0.25*	*−0.31*
Peak BAC	0.36**	0.33**	0.36**	**0.01**	*0.18*	*0.01*	*−0.01*	*0.00*	*0.01*	*0.00*	*0.00*
RAPI	0.28**	0.14**	0.35**	0.33**	**39.24**	*1.24*	*0.69*	*−0.43*	*0.58*	*−0.78*	*0.03*
RTCQ	0.11*	0.06	0.10*	0.19**	0.35**	**0.32**	*0.00*	*0.01*	*0.01*	*−0.03*	*0.00*
INCOM	−0.06	−0.08	0.02	−0.06	0.15**	0.00	**0.54**	*0.02*	*0.01*	*−0.06*	*0.03*
Future TP	−0.11*	−0.06	−0.11	−0.07	−0.13**	0.02	0.05	**0.29**	*−0.08*	*0.13*	*0.04*
Hedonistic TP	0.12**	0.04	0.18**	0.14**	0.22**	0.05	0.04	−0.36**	**0.19**	*−0.04*	*0.00*
SSRQ	−0.08	0.01	−0.13**	−0.06	−0.28**	−0.13**	−0.19**	0.54**	−0.23**	**0.20**	*−0.02*
Gender[a]	−0.29**	−0.30**	−0.15**	0.09*	0.01	−0.01	0.10*	0.15**	0.01	−0.07	**0.23**

Note. Variances are shown in boldface type, covariances in italics, and correlations in regular type. DPW = drinks per week; DDD = drinks per drinking day; HDD = heavy drinking days; BAC = blood alcohol concentration; RAPI = Rutgers Alcohol Problems Index; RTCQ = Readiness-to-Change Questionnaire; INCOM = Iowa-Netherlands Comparison Orientation Measure; SSRQ = Short Self-Regulation Questionnaire; TP = Time Perspective.

[a]Women were coded '1'.

** $p < .01$,

* $p < .05$.

Table 3

F Values for the Final General Linear Models Across the Five Outcome Variables.

Effect (df)	Drinks per Week (*N* = 479)	Drinks/Drinking Day (*N* = 487)	Heavy Drinking Days (*N* = 484)	Peak BAC (*N* = 477)	RAPI (*N* = 488)
BMI Intervention (2)	6.84**	2.45	4.47**	4.30**	3.48*
TL followback (1)	0.78	0.02	0.14	0.10	0.56
BMI x TLFB (2)	0.01	0.04	0.25	0.46	0.12
Gender	-- --	-- --	-- --	-- --	-- --
RTCQ (1)	5.41*	-- --	11.42**	9.53**	15.63**
SSRQ (1)	0.36	5.64*	-- --	8.95**	-- --
INCOM (1)	11.85**	4.01*	-- --	-- --	-- --
Future TP (1)	0.46	-- --	-- --	-- --	1.77
Hedonistic TP (1)	-- --	-- --	-- --	-- --	-- --
BMI x Gender (2)	-- --	-- --	-- --	-- --	-- --
BMI x RTCQ (2)	-- --	-- --	-- --	-- --	-- --
BMI x SSRQ (2)	6.63**	-- --	-- --	-- --	-- --
BMI x INCOM (2)	10.08**	-- --	-- --	-- --	-- --
BMI x Future TP(2)	7.85**	-- --	-- --	-- --	3.32*
BMI x Hedonistic TP(2)	-- --	-- --	-- --	-- --	-- --

Note. Dashes represent effects that were dropped from the respective final models for each of the outcome variables. All three-way and Timeline x Moderator interactions were omitted because they were not significant for any model. BAC = blood alcohol concentration; RAPI = Rutgers Alcohol Problems Index; RTCQ = Readiness-to-Change Questionnaire; INCOM = Iowa-Netherlands Comparison Orientation Measure; SSRQ = Short Self-Regulation Questionnaire; TP = Time Perspective.

* $p < .05$

** $p < .01$

Table 4

Standardized βs and 95% Confidence Intervals for All Effects Remaining in the Final Model

Predictor / BMI Condition	DPW lower	DPW mid	DPW upper	DDD lower	DDD mid	DDD upper	HDD lower	HDD mid	HDD upper	pBAC lower	pBAC mid	pBAC upper	RAPI lower	RAPI mid	RAPI upper
control	−0.411	−0.246	−0.083	−0.377	−0.207	−0.037	−0.384	−0.214	−0.044	−0.361	−0.191	−0.021	*−0.164*	*0.004*	*0.172*
BMI	−0.706	−0.539	−0.371	−0.547	−0.373	−0.199	−0.690	−0.518	−0.345	−0.684	−0.511	−0.339	−0.456	−0.283	−0.109
BMIe	−0.653	−0.483	−0.313	−0.517	−0.341	−0.165	−0.612	−0.436	−0.260	−0.448	−0.270	−0.093	*−0.344*	*−0.170*	*0.004*
RTCQ	−0.188	−0.102	−0.016				−0.240	−0.152	−0.064	−0.228	−0.139	−0.051	−0.261	−0.175	−0.088
SSRQ				−0.198	−0.108	−0.019				−0.224	−0.135	−0.046			
control	*−0.081*	*0.104*	*0.290*												
BMI	−0.490	−0.308	−0.125												
BMIe	*−0.076*	*0.106*	*0.288*												
INCOM				0.002	0.091	0.180									
control	0.145	0.308	0.471												
BMI	*−0.271*	*−0.125*	*0.022*												
BMIe	0.133	0.281	0.430												
FTP															
control	−0.407	−0.234	−0.062										*−0.269*	*−0.122*	*0.024*
BMI	0.071	0.258	0.445										*−0.050*	*0.103*	*0.257*
BMIe	*−0.311*	*−0.132*	*0.047*										−0.311	−0.158	−0.005

Note. Italics indicate individual βs not significantly different from zero because confidence intervals (CI) contain zero. Comparisons among the three BMI conditions can be made as follows: if the midpoint of one condition falls outside of the 95% CI for another, the conditions are significantly different at $p < .05$. DPW = drinks per week; DDD = drinks per drinking day; HDD = heavy drinking days; pBAC = peak blood alcohol concentration; RAPI = Rutgers Alcohol Problems Inventory; BMI = brief motivational intervention; BMIe = brief motivational intervention, enhanced with decisional balance; RTCQ = Readiness-to-Change Questionnaire; INCOM = Iowa-Netherlands Comparison Orientation Measure; SSRQ = Short Self-Regulation Questionnaire; FTP = future time perspective.