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Examination of a Dual-Process Model Predicting Riding with Drinking Drivers

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Abstract

Background—Nearly 1 in 5 of the fatalities in alcohol-related crashes are passengers. Few studies have utilized theory to examine modifiable psychosocial predictors of individuals' tendencies to be a passenger in a vehicle operated by a driver who has consumed alcohol. This study used a prospective design to test a dual-process model featuring reasoned and reactive psychological influences and psychosocial constructs as predictors of riding with drinking drivers (RWDD) in a sample of individuals aged 18 to 21.

Methods—College students ($N = 508$) completed web-based questionnaires assessing RWDD, psychosocial constructs (attitudes, expectancies, and norms), and reasoned and reactive influences (intentions and willingness) at baseline (the middle of the spring semester) and again 1 and 6 months later. Regression was used to analyze reasoned and reactive influences as proximal predictors of RWDD at the 6-month follow-up. Subsequent analyses examined the relationship between the psychosocial constructs as distal predictors of RWDD and the mediation effects of reasoned and reactive influences.

Results—Both reasoned and reactive influences predicted RWDD, while only the reactive influence had a significant unique effect. Reactive influences significantly mediated the effects of peer norms, attitudes, and drinking influences on RWDD. Nearly all effects were constant across gender except parental norms (significant for females).

Conclusions—Findings highlight that the important precursors of RWDD were reactive influences, attitudes, and peer and parent norms. These findings suggest several intervention methods, specifically normative feedback interventions, parent-based interventions, and brief motivational interviewing, may be particularly beneficial in reducing RWDD.

Keywords

Dual-Processing Model; Decision-Making; Riding with Drinking Drivers; Emerging Adults

Alcohol-related fatalities remain a major public health concern in the United States (Fell et al., 2009; Voas and Fell, 2011). Statistics reveal 1 person dies approximately every hour in

an alcohol-related vehicle accident, with individuals ages 18 to 24 having the highest fatality rates (National Highway Traffic Safety Administration, 2012). Further, nearly 1 in 5 of alcohol-related fatalities are passengers. Epidemiological research has shown that estimates as high as 63% of young adults have endorsed riding with drinking drivers (RWDD) (McCarthy and Pedersen, 2009). While research has documented RWDD base rates and demographic characteristics (Calafat et al., 2009; Cartwright and Asbridge, 2011; Poulin et al., 2007), these variables are not easily changeable in short-term campaigns. Identification of modifiable variables is needed for the further development of intervention programs aimed at reducing RWDD. Unfortunately, there has been limited work examining theoretical-based psychosocial predictors that influence decisions to RWDD. RWDD tends to be included as a secondary or combined outcome of research examining drunk driving (Li et al., 2014; Yu and Shackel, 1998). Given the prevalence of this high-risk behavior, the high fatality rates, and the potential for improving prevention efforts, research examining RWDD as a unique behavior is warranted. Thus, the goal of this study was to systematically examine the theoretical determinants of this understudied high-risk behavior.

Proximal Predictors of RWDD

Research has demonstrated the benefits of utilizing theoretical models that consider behavior as jointly influenced by both reasoned and reactive processes (e.g., Gibbons et al., 1998; Guilamo-Ramos et al., 2008). Research examining dual-processes has primarily drawn from 2 theoretical approaches, namely the theory of reasoned action (TRA; Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) and the prototype willingness model (PWM; Gerrard et al., 2008). The TRA states behavior is a function of reasoned processes, and at the forefront is the construct behavioral *intention*. According to the TRA, behavioral intention is the proximal predictor of performing a behavior, through which all other predictors are mediated (for review, see Fishbein and Ajzen, 2010). Like the TRA, the PWM contends reasoned processes are mediated through intentions, but it also introduces behavioral *willingness*, operationalized as an openness to engage in the behavior, as a reactive proximal predictor of behavior (Gerrard et al., 2008). For example, Gibbons and colleagues (1998) found that both intentions and willingness predicted unique variance in smoking. Thus, for this study's first aim, elements of both these theories were used to examine both the reasoned (intentions) and the reactive (willingness) processes influencing RWDD. While it was expected that intentions and willingness shared some common variance (e.g., someone intending to RWDD was also willing), we hypothesized each construct would also have a unique influence on RWDD. For example, some individuals may not intend to RWDD, but are willing to if they find themselves in a situation that arises. Based on research showing willingness tends to be more strongly associated with risky behaviors (Gibbons et al., 1998), we hypothesize willingness will have a stronger positive relationship with RWDD relative to intentions.

Distal Predictors of RWDD

The second aim of the study was to identify distal predictors of RWDD whose influence may be mediated by the reasoned and reactive constructs. The decision-making theories described above aided in identifying 3 classes of distal predictors: *expectancies, attitudes,*

and *normative beliefs*. These 3 classes have strong empirical tradition in predicting behavior (e.g., Guilamo-Ramos et al., 2008; Jaccard et al., 2002) and have been shown to be modifiable by intervention programs (e.g., Borsari and Carey, 2001; Cleveland et al., 2013; Larimer et al., 2001; Turrisi et al., 2010, 2013).

Expectancies

Expectancies are the perceived positive and/or negative believed outcomes of performing a behavior. Drinking expectancies have been identified as important predictors of alcohol use (Fromme and Dunn, 1992; Nicolai et al., 2010), drunk driving (Turrisi and Jaccard, 1992), and RWDD (DiBlasio, 1986; Grube and Voas, 1996). However, we identified only 1 cross-sectional study that examined the association between RWDD-specific expectancies and RWDD behavior (DiBlasio, 1988). Findings suggested RWDD expectancies (e.g., acceptance, positive feelings) were positively related to RWDD. Based on the literature showing consistent associations between expectancies and intentions (e.g., Ajzen and Fishbein, 1980; Maddux et al., 1986), it is anticipated that they will have stronger associations with the reasoned construct (intention) than the reaction construct (willingness).

Attitudes

Attitudes are the positive and negative feelings about performing a behavior (Fishbein and Ajzen, 2010). Positive attitudes toward alcohol use have consistently shown an association with increased drinking and drunk driving (Grube and Voas, 1996; Turrisi, 1999). Additionally, cross-sectional studies with younger teens have found correlations between feelings of approval of RWDD and RWDD behaviors (DiBlasio, 1986, 1988). Because attitudes are affect-based constructs, it is anticipated that they will have stronger associations with the reaction construct (willingness) than the reasoned construct (intention).

Normative Beliefs

Two types of normative beliefs have been examined with respect to drinking outcomes: injunctive and descriptive norms. Injunctive norms refer to the perceived approval of a behavior by referents close to the individual (Ajzen and Fishbein, 1980). Descriptive norms refer to the perceived frequency of the referent group engaging in behavior (Borsari and Carey, 2001; Lewis and Neighbors, 2006; Mallett et al., 2009). Both types of norms have been shown to consistently predict a wide range of drinking outcomes (e.g., weekly drinking, heavy episodic drinking; see Borsari and Carey, 2001). A review of the literature revealed cross-sectional evidence that injunctive and descriptive norms were both positively associated with RWDD (DiBlasio, 1988; Thombs et al., 1997). However, these studies have not examined whether the associations are a result of reactive or reasoned influences. As norms are social-based constructs, it is anticipated that they will have stronger associations with the reaction construct (willingness) than with the reasoned construct (intention).

Current Study

The goal of this study was to systematically examine RWDD in emerging adults using dual-process theory and a longitudinal framework. To achieve this goal, the first aim examined both reasoned influence, measured by intentions, and reactive influence, measured by

willingness, with each having its own unique influence on RWDD. The second aim sought to examine distal predictors of RWDD informed by behavioral decision-making theories and past empirical research. Finally, the research examined potential gender differences in the relationships between the constructs and in the prediction of RWDD. Past research examining the decision-making theoretic constructs has not provided substantial evidence to warrant strong hypotheses with regard to gender. Thus, this aspect of this study is exploratory. By extending the research to include a comprehensive theoretical examination of precursors to RWDD, this study will help inform prevention efforts focused toward decreasing the number of passenger injuries attributed to drinking drivers.

Materials and Methods

Recruitment and Participants

College students in their first, second, or third year at a large, public, northeastern university were invited to participate in a 3-wave longitudinal study of health-risk behaviors. A total of 900 students randomly selected from the university registrar's database were sent a letter and subsequent email explaining the study, including a URL and personal identification number (PIN) to access the survey. Participants were asked to complete web-based surveys at baseline (T1; March 2012), 1-month postbaseline (T2; April 2012), and 6-month postbaseline (T3; September 2012). Participants were paid \$30 for completing the baseline survey and \$15 for each follow-up. All study procedures were reviewed and approved by the university's institutional review board.

Approximately, 56% ($n = 508$) of invited students completed the baseline survey, which is consistent with other web-based approaches (Crawford et al., 2005; Larimer et al., 2007). The study had high retention rates of 88% ($n = 447$) and 81% ($n = 412$) at T2 and T3, respectively. At baseline, participants were on average 19.57 ($SD = 2.91$) years old, 50.1% female, 6.9% Hispanic, 78.9% Caucasian, 11 % Asian, 4.5% Black or African American, and 5.6% multiracial or other. School status was split relatively equally among the 3 years (37.2% freshmen, 34.6% sophomores, and 28.1% juniors). Although these proportions are representative of the larger university population and remained relatively stable over time, a higher proportion of males (25%) compared to females (11%) were lost to attrition. Students who left the study reported higher means of weekly drinking at baseline ($t = 4.08, p < 0.001$), which could also reflect the higher percentage loss of males. However, no differences were found due to attrition on baseline measures of RWDD, expectancies, attitudes, or norms.

Measures

To examine the hypothesized mediation framework, all demographics and distal predictors were measured at T1, proximal predictors (intentions and willingness) were assessed at T2, and RWDD was assessed at T3. Measures for each construct are described in detail below.

Riding with a Drinking Driver—To assess RWDD, students were asked to respond to 5 questions. The first 3 questions asked “How many times have you been a passenger in a vehicle when the driver had ... (i) 1 to 2 drinks in 2 hours; (ii) 3 to 4 drinks in 2 hours; and

(iii) 5 or more drinks in 2 hours?" The last 2 questions asked students to indicate how many times they had been a passenger in a vehicle when: (i) "you were unsure of the number of drinks the driver had?" and (ii) "you thought the driver probably should not have been driving because he/she had been drinking?" Response choices ranged from "0 times" (0) to "5 or more times" (5). All 5 questions were prompted with the statement, "Think about your experiences since April (the last time you took this survey)..." so that RWDD was assessed over the past 5 months. Items were summed to form a composite score of RWDD ($\alpha = 0.83$).

Proximal Predictors of RWDD

Willingness and Intentions to Ride with a Drinking Driver—To assess willingness, students were asked to indicate how much they agreed with the following statement: "Over the next 3 months, if a *parent* of mine has been drinking and offers to drive me home, I am *willing* to be a passenger in their car." This was also assessed for when the driver was a close friend, and when the driver was an acquaintance, specified as, "someone I don't know very well (e.g., a friend of a friend)." Response choices ranged from "strongly disagree" (−2) to "strongly agree" (+2). These items were averaged to form an overall score of willingness ($\alpha = 0.74$). Similarly, intentions to RWDD were assessed by student agreement level with the following statement: "Over the next 3 months, if a *parent* of mine has been drinking and offers to drive me home, I *intend* to be a passenger in their car." Again, this was assessed for when the driver was a close friend and an acquaintance; these 3 items were averaged for an overall score of intentions ($\alpha = 0.77$).

Distal Predictors of RWDD

Positive Expectancies—Based on previous work by Dhimi and colleagues (2011), 5 questions were used to assess positive outcome expectancies related to RWDD. Students were asked to indicate the extent to which they agreed that each item could be an outcome of RWDD. Items included (i) saving money by not having to take a taxi, (ii) getting to your destination quickly, (iii) not having to wait for public transportation, (iv) helping or supporting a friend, and (v) not having to walk or take alternative transportation. Response choices ranged from "strongly disagree" (−2) to "strongly agree" (+2). A mean score of the 5 items was used for an overall score of positive expectancies ($\alpha = 0.91$).

Negative Attitudes—Prior to this study, a sample of college students from a large research methods class ($n = 85$) was asked to list all of the feelings they associated with getting into a car with someone who had been drinking. Students received extra credit for participating, and the top 10 reported emotions were used to develop a measure of attitudes toward RWDD. The 10 most commonly listed feelings were negative in nature; examples included "Scared," "Unsafe," and "Worried." Within this study, participants were asked to report how much they agreed (strongly disagree −2, to strongly agree +2) with having each feeling when thinking "about being a passenger in a car when the driver has been drinking." The 10 items were summed for a composite score of negative attitudes ($\alpha = 0.97$).

Descriptive Norms—Perceived parental frequency of RWDD was assessed by adjusting the 5 questions that measured students' self-reported RWDD at baseline. For example, "In

the past year, how many times do you think *one of your parents* has been a passenger in a vehicle when the driver had *1 to 2 drinks* in 2 hours?" Students responded to the items using a 10-point scale ranging from "0 times" to "More than 9 times." Items were summed to form a composite score of parental descriptive norms ($\alpha = 0.89$). Peer descriptive norms were assessed by summing 5 similar items, but used "one of your close friends" as the referent ($\alpha = 0.94$).

Injunctive Norms—Two items assessed injunctive norms at baseline. Using a 5-point scale ranging from "strongly disapprove" (−2) to "strongly approve" (+2), students were asked, "How would *one of your close friends* react if you were a passenger in a car and *the driver had been drinking alcohol*?" The same item was administered to assess parental injunctive norms by replacing "close friends" with "parents" in the stem.

Data Analyses

Preliminary analyses examined means and standard deviations for all variables. Multiple *t*-tests were performed to examine mean differences between males and females on all variables. Additionally, variables were mean-centered prior to the main aims analyses.

This study's first aim was to examine RWDD, using a dual-process theory approach by assessing reactive (willingness) and reasoned (intentions) processes as predictors of RWDD (i.e., proximal predictors) and to explore the potential gender differences. To do so, 2 nested path models with 2-group solutions (males and females) were examined using Mplus (v6.2; Muthén & Muthén, Los Angeles, CA). Both models regressed RWDD onto intentions and willingness and allowed a correlation between intentions and willingness, as the zero-order correlations between the 2 variables were high ($r = 0.84$). The first model constrained all paths to be equal across males and females, and the second model allowed all paths to be freely estimated. As the 2 models were nested, the goodness of fit could be compared with a significant difference in fit indicating gender differences in the model. Missing responses were minimal (<5% on any variable) and addressed using full information maximum likelihood, the default missing data method applied by Mplus. To account for non normally distributed variables, model fit was evaluated with the Satorra–Bentler scaled chi-square statistic (SB χ^2) and using maximum likelihood estimation with robust standard errors. Nested models were compared using a difference test scaling correction (cd), calculated from the ratio of normal theory to SB χ^2 test statistics (Satorra and Bentler, 2001). A significant reduction in chi-square, relative to change in degrees of freedom (df), indicated that the freely estimated model would provide a better fit to the data than the constrained model. Only significant proximal predictors were analyzed for Aim 2.

Aim 2 of this study was to assess distal predictors of RWDD. Results from the Aim 1 analyses indicated that intention was not a significant unique predictor of RWDD; thus, it was removed from the analyses of Aim 2. To assess Aim 2, two nested path models with 2-group solutions (males and females) were examined. Both models regressed RWDD onto willingness and willingness onto the hypothesized distal predictors (expectancies, attitudes, and parental and peer norms). Thus, for this model, there were 6 exogenous variables (distal predictors: attitudes, expectancies, normative beliefs), with all 15 covariances estimated

between them and 2 endogenous variables (willingness and RWDD). Again, the first model constrained the paths to be equal, and the second model allowed the paths to be freely estimated among males and females. The fit of the models were compared.

To determine mediation, we utilized the joint-significance test as identified by MacKinnon and colleagues (2002). The joint-significance test signifies mediation when both the α path (between distal predictors [e.g., norms, expectancies, attitudes] and the proximal predictor [willingness]) and the β path (between the proximal predictor [willingness] and criterion [RWDD]) are significant. The effect size of the mediated path is identified as the product of both path coefficients ($\alpha\beta$). Bootstrapped confidence intervals were used to further address non-normality within the model. Path coefficients and mediated effects were considered significant if the 95% bootstrapped confidence interval range did not include zero. The goodness of fit for the models was also assessed using comparative fit index (CFI), and root mean square error of approximation (RMSEA) fit indices and modification indices were examined.

Results

Preliminary Analyses

Zero-order correlations are presented in Table 1. Means and standard deviations (overall and by gender) can be found in Table 2. Results revealed significantly higher mean levels of intentions, willingness, peer injunctive norms, and positive expectancies for males relative to females. Females had significantly higher scores on negative attitudes toward RWDD. There were no gender differences observed for RWDD, parental injunctive and descriptive norms, or peer descriptive norms.

Aim 1: Examining Intentions and Willingness as Proximal Predictors of RWDD

Examination of the 2 nested models assessing the reactive (willingness) and reasoned (intentions) processes as proximal predictors of RWDD revealed the fit did not significantly differ between the constrained and the freely estimated models (SB $\chi^2 = 5.189$, $cd = 1.289$, $df = 3$, $p > 0.05$). This indicated there were no differences between males and females in the path coefficients. Thus, the constrained model, being the more parsimonious of the two, was identified as the best model. The fit of the bootstrapped model was judged as acceptable, SB $\chi^2 = 6.683$, $df = 3$, $p = 0.08$; RMSEA = 0.073; CFI = 0.884, with the proximal predictors accounting for 8.9% of the variance of RWDD in males and 7.7% of the variance in females. Results indicated that willingness was the only significant unique predictor of RWDD ($\beta = 0.422$, $SE = 0.184$, $p < 0.05$). Therefore, intentions were removed from the subsequent models and only willingness was examined as a proximal predictor of RWDD.

Aim 2: Testing the Theoretical Framework

The second aim examined distal predictors of RWDD and the mediation effects of willingness. Examination of the 2 nested models revealed that there was not a significant difference in fit (SB $\chi^2 = 7.407$, $cd = 1.182$, $df = 7$, $p > 0.05$), indicating that there were no gender differences. Therefore, the constrained model was chosen as the best due to parsimony. Path coefficients, mediated effects, and 95% bootstrapped confidence intervals

can be found in Table 3. Examination of the distal predictors (α paths) revealed that, as expected, higher reports of positive expectancies, parental descriptive norms, and peer injunctive norms were associated with increased willingness, and negative attitudes were associated with decreased willingness. Collectively, the examined paths accounted for 11.2% of the variance in willingness for males and 14.3% of the variance for females. Consistent with the findings from Aim 1, willingness significantly predicted RWDD (β path), with students who reported more willingness to RWDD engaging in more RWDD. Willingness accounted for 10.4% of the variance of RWDD for males and 7.1% of the variance of RWDD in females. According to the joint-significance test, willingness (the proximal predictor of RWDD) significantly mediated the effects of the distal predictors (positive expectancies, negative attitudes, parental descriptive norms, and peer injunctive norms) on the criterion (RWDD).

However, the proposed model was deemed to have relatively poor fit both without, SB $\chi^2 = 68.554$, $df = 19$, $p < 0.001$; RMSEA = 0.102; CFI = 0.557, and with bootstrapping, SB $\chi^2 = 91.072$, $df = 19$, $p < 0.001$; RMSEA = 0.123; CFI = 0.541. An examination of the modification indices suggested 2 alterations in the model for females only: direct effect of RWDD onto both parental and peer descriptive norms. While these paths are contrary to our theoretical model, we allowed these to be estimated to explore the changes in path coefficients and model fit. This new model had good model fit, SB $\chi^2 = 26.328$, $df = 17$, $p = 0.07$; RMSEA = 0.047; CFI = 0.912, was a significantly better fit than the hypothesized model (SB $\chi^2 = 25.379$, $cd = 2.33$, $df = 2$, $p < 0.001$), and no additional modification indices were indicated. This updated model (see Fig. 1), estimated with bootstrapping, was also judged to have good fit, SB $\chi^2 = 31.888$, $df = 17$, $p < 0.05$; RMSEA = 0.059; CFI = 0.905. In this model, the distal predictors still accounted for 11.2% of the variance in willingness for males and 14.3% of the variance for females. However, the distal and proximal predictors accounted for only 6.5% of the variance of RWDD in males, whereas the predictors accounted for 30.8% of variance of RWDD in females. Willingness remained a significant predictor of RWDD. Additionally, positive expectancies, negative attitudes, parental descriptive norms, and peer injunctive norms remained significant predictors of willingness, with path coefficients and mediation effects relatively unchanged. Examination of the modified direct paths for females revealed parental descriptive norms significantly predicted RWDD ($\beta = 0.120$, $SE = 0.045$, $p < 0.01$) and a trending regression effect of peer descriptive norms on RWDD ($\beta = 0.060$, $SE = 0.035$, $p = 0.08$).

Discussion

The current study sought to prospectively and systematically examine theory-driven predictors of RWDD. The first aim was to examine reactive (willingness) and reasoned (intentions) processes as proximal predictors of RWDD and explore the potential gender differences. The results support the notion that RWDD is influenced by reactive processes, instead of both the reactive and reasoned processes. Additionally, our findings indicate that males and females do not significantly differ on how reactive and reasoned processes predict RWDD. Given the negative social stigma associated with impaired driving, it is not surprising that students do not seem to actively plan to RWDD, but rather are open to reactive influences if the situation arises. Additionally, intentions to RWDD may only be

one aspect of the reasoned path. Specifically, students may intend to use alternatives of RWDD (i.e., walking, calling a cab, etc.) if the person who drove ended up drinking, yet they may still RWDD if the alternatives do not seem attractive and/or viable. Therefore, intentions to RWDD and intentions to use RWDD alternatives should be examined in future work.

The study's second aim examined expectancies, attitudes, and peer and parental normative beliefs as distal predictors of RWDD, mediated through willingness (the significant proximal predictor). Positive expectancies (i.e., believed positive outcomes of RWDD, such as saving money by not having to take a taxi) significantly predicted greater willingness to RWDD. Additionally, 2 RWDD normative beliefs, specifically perceived parental frequency of RWDD and perceived peer approval of RWDD, were associated with increased willingness to RWDD. Negative attitudes toward RWDD predicted decreased willingness to RWDD. Significant mediation effects were found for these paths, although the strongest effect was observed for peer approval. Contrary to our hypotheses, parental approval and peer descriptive norms did not influence willingness to RWDD. Further, after examining the modification indices, 2 additional paths emerged for females. Parental descriptive norms had a significant direct effect and peer descriptive norms had a trending direct effect on RWDD, such that the more students perceived their parents and close friends to RWDD, the more they endorsed the same behavior. These paths were not included in our initial theoretical model; however, they are consistent with previous findings that demonstrate strong and direct effects of perceived norms on engaging in risk behavior (Bailey et al., 2007; Borsari and Carey, 2003; Rhodes et al., 2014). Further, the addition of direct paths might suggest additional unmeasured mediators. For example, individuals who perceive their parents and peers to RWDD more frequently may be riding along with them, suggesting the need to assess the context in which RWDD occurs (i.e., who is the driver). Future work should examine context as an additional mediator. Last, individuals who are unwilling to RWDD may naturally remove themselves from contexts where RWDD might be approved of or necessary to get home. Further research efforts should examine how parental and peer descriptive norms, as well as other psychosocial factors, impact intentions to avoid RWDD or use RWDD alternatives.

The results indicating only females had direct effects between RWDD and descriptive norms are consistent with previous work that suggests descriptive norms are more important for female young adults (e.g., Scaglione et al., 2013). However, prior work within this age group has focused primarily on peer norms. This study is the first to identify the impact of parental descriptive norms on RWDD, especially for women.

Implications for Prevention

Taken together, the findings suggest several possible entry points for intervention. First, the effects of perceived peer approval on willingness, and peer descriptive norms on RWDD, suggest normative feedback interventions may help address RWDD within the college population. Normative feedback has been used in a variety of formats (online, in person) with success in reducing drinking (Borsari and Carey, 2000) and could be adapted for RWDD. Second, the influence of parental norms, especially among college women, might

be addressed using parent-based intervention (PBI). PBIs have been effective at decreasing risky drinking and delaying escalation to risky drinking (Turrisi et al., 2001, 2013). PBI helps parents communicate more effectively about alcohol while emphasizing the importance of modeling responsible drinking behavior. This could be expanded to emphasize the importance of not modeling RWDD. Finally, brief motivational interviewing (BMI; e.g., Brief Alcohol Screening and Intervention for College Students; Dimeff et al., 1999) has been effective at reducing college drinking and alcohol-related problems (Larimer and Cronce, 2007). BMI encourages students to be actively involved in developing methods for changing behaviors viewed as problematic (Borsari and Carey, 2000; Dimeff et al., 1999). BMIs could target willingness to RWDD by helping students recognize the negative attitudes associated with RWDD or potential alternatives to RWDD.

Limitations and Future Directions

Although the current study has strengths, it is not without some limitations. First, the correlations between the distal predictors and intentions were similar, which may further indicate that there is a singular reactive process that impacts RWDD. However, it is plausible that multiple processes may still be operating, suggesting the need to examine RWDD from different perspectives. For example, if both the decision to RWDD and the decision not to RWDD are examined, then it is plausible that the reactive influence will be predictive of the risk behavior (RWDD) and the reasoned influence will be predictive of the protective behavior (avoiding RWDD). This explanation would be consistent with previous studies suggesting willingness can be a stronger predictor for risky behaviors (Gibbons et al., 1991; Mallett et al., 2011; Wills et al., 2000), whereas intentions may be a better predictor of health promotion behaviors (e.g., Webb and Sheeran, 2006). Future research might benefit from examining multiple behaviors surrounding RWDD that include health promotion (e.g., taking a cab, walking, etc.) and risky options (e.g., riding; Jaccard, 1981; Jaccard and Becker, 1985). Second, although the proximal predictors accounted for whom students might be willing to ride with (parent vs. close friend vs. acquaintance), the outcome measures did not account for these levels of familiarity with the driver. For example, decisions to ride with an acquaintance who has been drinking at a bar or party may vary from riding with a close friend after dinner at a restaurant. Future work would benefit from examining the relationships with the drivers as well as where the drinking occurred.

In sum, using theory grounded in behavioral decision making, the findings provide several compelling avenues for targeting RWDD within prevention frameworks such as normative feedback, BMI, and PBI.

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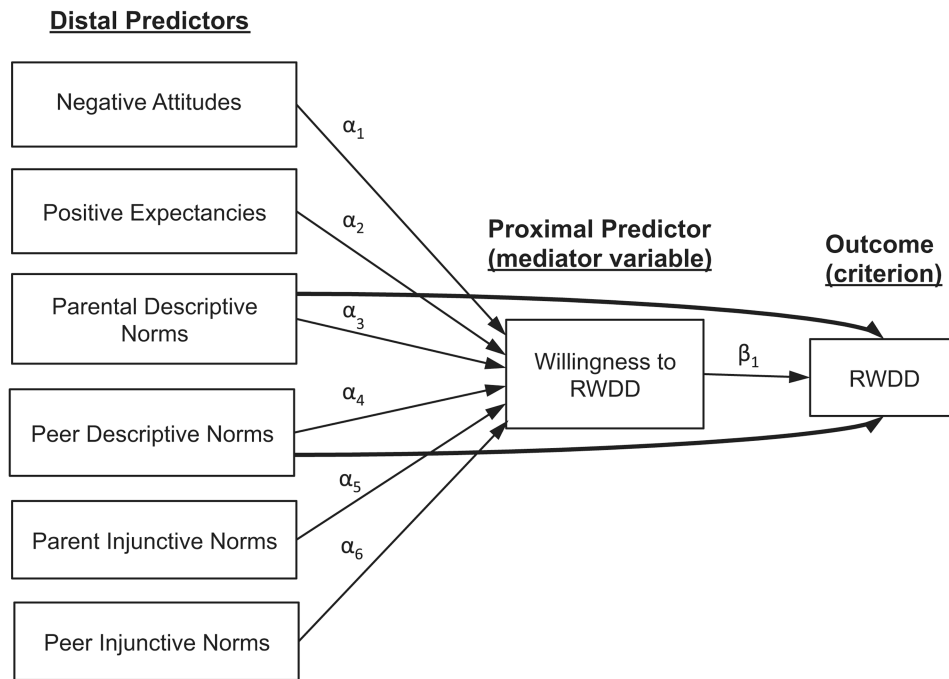


Fig. 1. Model with added regression paths indicated by modification indices. *Note 1:* α paths are between distal and proximal predictors. *Note 2:* β path is between proximal predictor and outcomes. *Note 3:* Bold lines are paths indicated by model modification indices and are estimated only for females.

Table 1

Zero-Order Correlations

	1	2	3	4	5	6	7	8	9
1. RWDD	1.00								
2. Intentions	0.24**	1.00							
3. Willingness	0.28**	0.84**	1.00						
4. Pos. expectancies	0.13**	0.16**	0.20**	1.00					
5. Neg. attitudes	-0.20**	-0.24**	-0.26**	-0.19**	1.00				
6. Parental descriptive norms	0.33**	0.14**	0.17**	0.04	0.00	1.00			
7. Peer descriptive norms	0.31**	0.14**	0.16**	0.15**	-0.06	0.42**	1.00		
8. Parental injunctive norms	0.14**	0.03	0.09*	0.08	-0.22**	0.08	0.08	1.00	
9. Peer injunctive norms	0.25**	0.22**	0.25**	0.20**	-0.22**	0.10*	0.29**	0.42**	1.00

RWDD, riding with drinking drivers.

* $p < 0.05$,** $p < 0.01$.

Table 2
Means, Standard Deviations, and *t*-Values for Males and Females

Variable (range)	Mean (SD)				<i>t</i>
	Overall	Males	Females		
RWDD (0 to 25)	1.94 (3.64)	1.88 (3.43)	1.99 (3.82)		-0.30
Intention (-3 to +3)	-1.11 (0.82)	-0.96 (0.86)	-1.24 (0.76)		3.71***
Willingness (-3 to +3)	-1.08 (0.83)	-0.94 (0.87)	-1.20 (0.77)		3.37***
Pos. expectancies (-2 to 2)	-0.25 (1.00)	-0.13 (0.99)	-0.37 (0.99)		2.70**
Neg. attitudes (-20 to 20)	12.82 (7.05)	10.83 (7.63)	14.76 (5.81)		-6.52***
Parental descriptive norms (0 to 50)	7.22 (10.86)	6.72 (10.38)	7.81 (11.36)		-1.13
Peer descriptive norms (0 to 50)	10.84 (12.21)	10.84 (12.41)	10.77 (11.82)		0.07
Parental injunctive norms (-2 to +2)	-1.77 (0.55)	-1.73 (0.58)	-1.80 (0.53)		1.46
Peer injunctive norms (-2 to +2)	-1.27 (0.74)	-1.18 (0.72)	-1.35 (0.75)		2.65**

RWDD, riding with drinking drivers.

**
 $p < 0.01$,

 $p < 0.001$.

Table 3
Unstandardized Path Coefficients, Significant-Mediated Effects, and Confidence Intervals from Constrained Model

Distal predictors	Predictor effects on willingness (α)	Effect of willingness on RWDD (β)	Mediated effect ($\alpha\beta$)	95% CI of mediated path
Positive expectancies	0.294 (0.127) *	0.431 (0.096) ***	0.127 (0.058) *	0.032; 0.261
Negative attitudes	-0.066 (0.023) **		-0.029 (0.012) *	-0.058; -0.010
Parental descriptive norms	0.033 (0.011) **		0.014 (0.006) *	0.004; 0.030
Peer descriptive norms	0.006 (0.012)			
Parental injunctive norms	-0.290 (0.279)			
Peer injunctive norms	0.179 (0.173) **		0.207 (0.093) *	0.059; 0.437

RWDD, riding with drinking drivers.

* $p < 0.05$,

** $p < 0.01$,

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