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A Longitudinal Examination of Decisions to Ride and Decline Rides with Drinking Drivers

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Abstract

Background: Riding with a drinking driver (RWDD) is a serious concern that leads to numerous preventable deaths every year. There is a significant gap in research on empirically tested predictors of RWDD that could be implemented in prevention efforts. College students are in need of such prevention efforts, as they have some of the highest rates of alcohol-related crash fatalities and may RWDD more than their non-college peers. The current study utilized behavioral decision-making approach to examine predictors of RWDD and declining a ride from a drinking driver (Decline) in older college students.

Methods: Students (n=791) in their 3rd year of college were enrolled from 3 large and diverse universities. Psychosocial (e.g., expectancies, norms) and decision-making variables (willingness to RWDD and intentions to use alternatives) were assessed in the fall of their 3rd year. One year later, RWDD and Decline behaviors were assessed. Zero-inflated Poisson (ZIP) analyses were used to assess how decision-making variables predicted RWDD and Decline behavior. Associations between psychosocial and decision-making variables were also assessed.

Results: Thirteen percent of students reported RWDD and ~28% reported Decline behavior. Willingness to RWDD and typical weekly drinking were both associated with increases in RWDD (OR = 1.58 and 1.40, respectively), whereas intentions to use alternatives, sex, and ethnicity were not associated with RWDD. Only weekly drinking was associated with Decline, with an increase of drinking associated with increased Decline (OR= 1.48). All psychosocial variables were significantly associated with the decision-making variables except positive expectancies.

Conclusions.—Results provide evidence that willingness to RWDD is a predictor of future RWDD, even if students intend to use safe alternatives. Future research is needed to better understand decision-making factors that influence Decline. Results also suggest prevention and

interventions efforts, such as brief motivational interviewing, Parent-Based Interventions, and normative feedback interventions could be adapted to reduce RWDD.

Keywords

Decision-making; Riding with a Drinking Driver; College Students

Introduction

Alcohol-related crashes result in approximately 10,000 fatalities each year in the U.S., translating to 1 death every 53 minutes (National Highway Traffic Safety Administration [NHTSA], 2016). While the overall number of alcohol-impaired car crashes has decreased in the past twenty years, the annual number of fatalities and injuries has remained stagnant since 2009 (NHTSA, 2016). To address this major public health problem, intervention and public health efforts have focused on diminishing the number of alcohol-impaired drivers (Ecola et al., 2018; Goodwin et al., 2009). By comparison, far less attention has been directed to passengers who ride with impaired drivers (RWDD). A review by Elder and colleagues (2005) suggests that educational interventions may reduce RWDD. However, it is difficult to draw many conclusions due to the extremely limited number of studies (n=4), all of which were over 15 years old, and where RWDD was assessed for a short period of time (e.g., past 30 days). Since passengers comprise nearly 15 percent of all alcohol-related vehicle fatalities (NHTSA, 2016b) increased prevention efforts to reduce RWDD is warranted, and the paucity of research signifies a significant gap in the research.

College students are in need of such prevention efforts to reduce RWDD. College students are in the age group that has the highest rates of fatalities due to alcohol related crashes (NHTSA, 2017b). Some research suggests college students have higher rates of RWDD relative to their non-college counterparts (Paschall, 2003), while others have found no significant differences (Li et al., 2018). Older students in their 3rd and 4th years of college may be at greatest need as research has indicated driving under the influence and RWDD increases after students turn 21 (Beck et al., 2010). Although college campuses experience barriers in implementing prevention efforts, such as lack of resources or staff (Cronce and Larimer, 2005), most provide some overall drug and alcohol programs to students (Shupp et al., 2015). Theoretically based research on predictors of RWDD can aid in developing RWDD components that can be added into such programs. Despite concerns for the problem, studies examining college student RWDD have largely been descriptive and lack a focus on examining theoretical based constructs (e.g., Calafat et al., 2009; Cartwright and Asbridge, 2011; Li et al., 2018 Walker et al., 2003). The current study sought to address this limitation by using a prospective design to examine predictors of RWDD using behavioral decision-making framework.

Decision-Making Processes of RWDD.

Researchers have a long history of utilizing behavioral decision-making theories, such as Theory of Reasoned Action (Ajzen and Fishbein, 1980; Fishbein and Ajzen, 1975) and the Prototype Willingness Model (Gerrard et al., 2008), to inform development of intervention and prevention programs. The Theory of Reasoned Action (TRA) suggests behavior is a

function of both intentions/plans and social influences (e.g., norms). The Prototype Willingness Model (PWM) has a large literature suggesting behavior is a function of both reactive (willingness to engage in the behavior) and reasoned influences (active intentions to engage in a behavior) (Gibbons et al., 1998; Gibbons et al., 2009; Mallett et al., 2015; Scaglione et al., 2015). Drawing from both theoretical approaches, Hultgren and colleagues (2015) examined willingness and intentions to RWDD as predictors of RWDD in a sample of college students using a longitudinal design. Results showed willingness to RWDD, and not intentions, was the prevailing predictor of RWDD behavior 5 months later.

While the Prototype Willingness Model (PWM) suggests both willingness and intentions are unique predictors of behavior (Gerrard et al., 2008), there are a few studies that provide support for the notion that intentions may be more strongly associated with protective behaviors whereas willingness may be more strongly associated with risk behaviors (Gibbons et al., 1998; Hultgren et al., 2015; Mallett et al., 2015). These findings are consistent with other decision-making research that posit individuals' behaviors are ultimately based on both how they construe risky behaviors as well as *alternatives* to the risky behaviors (see Turrisi, 1999; Turrisi and Jaccard, 1992). Taken together, there remains a missing component to the examination of the decision to RWDD. Past research has only focused on willingness and intentions to RWDD and not accounted for the *alternatives* to RWDD (e.g., walking, bus riding). The current study's first aim was to address this limitation by expanding the behavioral decision-making framework to examine both willingness to RWDD and intentions use alternatives to RWDD. Based on findings from Hultgren et al. (2015), it was hypothesized that willingness to RWDD would be positively associated with RWDD and intentions to use alternatives would be negatively associated with subsequent RWDD.

Another important goal in the prevention of RWDD is to increase individuals' decisions to decline rides from drinking drivers (Decline). Past research has only focused on examining predictors of RWDD and not Decline behavior. Thus, the current study's second aim was to address this gap by examining how Decline behavior is associated with willingness to RWDD and intentions to use alternatives to RWDD. We hypothesized that willingness to RWDD would be negatively associated with Decline and that intentions to use alternatives would be positively associated with Decline behavior one year later (see Figure 1).

Finally, past research has shown that psychosocial variables, such as expectancies and peer norms, are important targets of change for the decision-making constructs of willingness and intentions (e.g., Mallett et al., 2015; Turrisi and Jaccard, 1992). Although Hultgren et al. (2015) included psychosocial variables the study was limited to examining only their associations with willingness and intentions to RWDD. The third aim of the present study expanded the focus to examine associations with both willingness to RWDD and intentions to use alternatives to RWDD. By examining the theoretical psychosocial constructs that have extensive empirical support (e.g., expectancies, attitudes, norms, image prototype, and self-efficacy; see Fishbein and Ajzen, 1975; Gibbons et al., 1998) and both willingness to RWDD and intentions to use alternatives to RWDD, the present study will identify relevant theoretical targets to inform prevention efforts.

Materials and Methods

Procedure

All participants were recruited as part of a larger parent study that examined college student drinking and parental communication across the 4 years of college. During the fall semester of their first year of college, students were randomly selected from the registrars' lists at three large and diverse universities in the United States (N=3328) in 2012. Potential participants were mailed invitation letters explaining the purpose of the study, procedures, URL to access the survey, along with a Personal Identification Number (PIN) to log into the online survey, and compensation (Students received \$30-35 for each assessment). Eligibility criteria included: 1) students had to be 18 or 19 years old and willing to participate in the 4 year study, and 2) have at least one parent or guardian consent to be willing to participate in the 4 year study. Of those, 1479 met the first criterion (44.4%) and of those, 937 students (63.4%) were deemed eligible to continue in the study. By year 3 (Time 1 assessment for the current study), a total of 791 eligible students completed measures, and 724 completed measures during their 4th year (Time 2 assessment for the current study, 91.5% retention; 77.3% retention from year 1 of parent study). The sample for the current study self-identified as 61.4% female, 14.1% Hispanic, 75.8% White, 4.1% Black or African American, 11.9% Asian, 5.5% Multiracial, and 3.1% Other or did not identify. Compared to the enrolled student population at the three universities, the current sample had more females (61.4% vs 51.6%; $\chi^2(1, N=18418) = 29.56; p < .001$), a smaller percentage of Non-White Hispanics (12.48% vs 22.96%), and a larger percentage of students identifying as White, Non-Hispanic (68.14% vs 51.17%; $\chi^2(7, N=16964) = 97.01; p < .001$). The current sample reported similar drinking in past month as in reports with national representative samples (65.8% vs 63%; Schulenberg et al., 2017)

Measures

Time 1 Assessment

Decision-Making Constructs

Willingness to RWDD.: Students responded using a seven-point Likert scale that ranged from *Extremely Disagree* (−3) to *Extremely Agree* (+3) on their level of agreement to the statements, “I am willing to get into the car when the driver has been drinking” and “I am willing to get into the car when the driver has had 5 or more drinks in 2 hours”. The two items were summed ($r = 0.53$) to create an index score.

Intentions to Use Alternatives.: Students responded using a seven-point Likert scale that ranged from *Extremely Disagree* (−3) to *Extremely Agree* (+3) on how much they agreed they intended to use four alternatives of RWDD: 1) use a taxi or use public transportation, 2) call another friend who has not been drinking for a ride, 3) walk to my destination, and 4) not get in the car, even if I do not have a plan to get to my destination. Intentions to use these alternatives were assessed for when the driver “has been drinking” and “has had 5 or more drinks in 2 hours.” The eight items were summed for a composite score of intentions to use alternatives ($\alpha = 0.89$).

Psychosocial Variables

Attitudes.: Both attitudes toward RWDD and attitudes toward alternatives were assessed. For attitudes toward RWDD, students used a 7-point scale from *Extremely Negative* (−3) to *Extremely Positive* (+3), to indicate how positive/negative they found “being in a vehicle with a driver who has consumed alcohol.” Using this same scale, students indicated how positive/negative they found the four alternatives. Items were summed to form a composite score ($\alpha = 0.90$).

Expectancies.: Negative and positive expectancies of RWDD were assessed. Students indicated how likely they believed an outcome was to occur if they were to RWDD using a 7-point scale that ranged from *Extremely Unlikely* (−3) to *Extremely Likely* (+3). Negative expectancies included: 1) being injured or killed, 2) someone else being injured or killed, and 3) receiving some sort of punishment from your parents ($\alpha = 0.82$). Positive expectancies included: 1) saving money by not having to take a taxi, 2) avoiding personally driving because you have been drinking, and 3) not having to walk to take alternative transportation ($\alpha = 0.61$).

Descriptive RWDD Norms.: Descriptive RWDD norms were assessed with three referent groups: peers, mother, and father. For peer descriptive RWDD norms, students were asked how many times in the past year their closest friends had been a passenger in a vehicle when they knew the driver had consumed alcohol. Students had 12 response options which ranged from *Never* (0), *Yes, but not in the past year* (1), *1 time* (2), through *11+ times* (12). Maternal and paternal descriptive RWDD norms were assessed using the same questions but replacing “closest friend” with “mother” and “father”.

Injunctive RWDD Norms.: Injunctive RWDD norms were assessed using peers, mother, and father as referent groups. For peer injunctive RWDD norms, students were asked to indicate how much their closest friends would approve of the student being a passenger in a vehicle when they knew the driver had consumed alcohol. Response options were on a 7-point scale and ranged from *Extremely disapprove* (−3) to *Extremely approve* (+3). Again, to assess maternal and paternal RWDD norms, “closest friends” was replaced with “mother” and “father”.

Image Prototype.: To assess RWDD risk-image, students were asked about their overall impression of people who ride in the car when the driver has been drinking alcohol. Response options were on a 7-point scale that ranged from *Extremely negative* (−3) to *Extremely positive* (+3). To assess risk-avoidance image, students used the same scale to indicate their overall impression of people who, instead of RWDD: 1) call a taxi or use public transportation, 2) call a friend who has not been drinking for a ride, 3) walk, and 4) decline a ride from a driver who has been drinking even without another plan to get to their destinations. Composite scores of risk-image prototype and alternative image prototype were formed ($\alpha = 0.95$).

Self-Efficacy to Use RWDD Alternatives.: Students were asked to rate their level of confidence in engaging in the four alternatives to RWDD. Response options were on a 5-

point scale that ranged from *Not at all confident* (0) to *Extremely Confident (100% sure)* (4). These items summed to form an index of self-efficacy to use alternatives ($\alpha = 0.84$).

Covariates

Typical Weekly Drinking.: Typical weekly drinking was assessed using the Daily Drinking Questionnaire (DDQ; Collins et al., 1985), which asked participants to indicate the number of drinks they consume on each day of a typical week. This was summed to create the number of typical weekly drinks.

Demographics.: Students were asked to report on standard demographics such as sex, age, race, and ethnicity. Sex was coded as Male (0) and Female (1); race was recoded as White (0) and Non-White (1); ethnicity was coded as Non-Hispanic (0) and Hispanic (1).

Time 2 Assessment

RWDD and Decline Behaviors.: To assess RWDD, students reported the number of times in the past year they were a passenger in a vehicle when they thought the driver had too much to drink to drive. To assess Decline, students reported the number of times they declined a ride from a driver who they thought probably had too much to drink to be driving. Response options were on a 7-point scale that ranged from *No, or not in the past year* (0) to *11 or more times in the past year* (6).

Data Analyses

Preliminary Analyses—All continuous variables were adjusted for outliers using procedures outlined by Tabachnick and Fidell (2013), such that for variables with a skewness of +2 and a Kurtosis of +5 all values that fell outside of ± 3.29 standard deviations from the mean were adjusted. The variables were then standardized. Typical weekly drinking, RWDD, and Decline were not standardized due to their count nature. Zero-order correlation was conducted on willingness and intentions. Chi-square analyses were conducted to examine differences in RWDD and Decline behavior in regards to sex, race, and ethnicity. All analyses were performed in Mplus (Version 6.11; Muthén and Muthén, 2011).

Zero-Inflated Poisson Analyses—Zero-inflated Poisson (ZIP) analysis was chosen to account for both the count nature and over dispersion of students reporting zero (none) of the outcomes. ZIP regression analyses model two separate processes, a logit portion that examines predictors of the presence/absence of the event (zero/not zero), and a Poisson (count) portion. ZIP analyses model a distribution that includes two types of zeros: structural zeros modeled in the logit portion and sampling zeros modeled in the Poisson portion (Alfö and Maruotti, 2010, Cox et al., 2009). Many researchers have utilized ZIP models in assessing health risk behavior to account for these types of zeros, especially in alcohol use (e.g., Buu et al., 2011; Neal et al., 2005). For example, in assessing alcohol use in the past weekend, individuals may have zero drinks because they completely abstain from alcohol (structural zero) whereas some individuals may drink, but did not consume any drinks in the past weekend (sampling zero). As the Poisson and logit aspects of ZIP are modelled as

distinct processes, predictors can differ across the two portions of the model. Each outcome (i.e., RWDD, Decline) was regressed onto each decision-making variable (i.e., willingness to RWDD and intentions to use alternatives) for both the logit and the count portions of the models. Sex, race, ethnicity, and typical drinking behavior were also included in the model as covariates of the outcomes. Since the focus of this paper was not on predicting the structural zeros, or presence/absence of the behavior (logit portion), but rather how much students engaged in RWDD and Decline behavior (count portion), non-significant predictors in the logit model were dropped from the analyses for a more parsimonious model. Preliminary analyses revealed willingness to RWDD and intentions to use alternatives were significantly correlated ($r = -0.35$, $p < .001$), and thus these variables were allowed to covary in the model. A heuristic model of the analysis is provided in Figure 1. Analyses were conducted in Mplus using Monte Carlo integration with maximum likelihood robust (MLR) estimation, which addresses missing data using Full Information Maximum Likelihood (FIML).

Correlational Analyses.—Bivariate correlations were conducted between each of the psychosocial variables (e.g., attitudes, expectancies, norms, etc.) and the decision-making variables (i.e., willingness to RWDD and intentions to use alternatives).

Results

Preliminary Analyses

A total of 94 (13.0%) students reported RWDD and 202 (27.9%) reported Decline at least once in the past year. RWDD and Decline had a weak but significant correlation ($r = 0.29$, $p < .001$). A total of 58% of students who reported any RWDD also reported Decline at least once, and 27.2% of students who reported any Decline also reported RWDD at least once in the last year. Cross tabulation of RWDD and Decline frequency by Sex, Race, and Ethnicity can be found in Table 1. Students who were White/Caucasian had a higher percentage reporting Declining 1-2 and 3-4 times in the past year, whereas students who identified as being Non-White had a higher percentage of having zero, or not declining in the past year ($\chi^2(6, N = 721) = 17.74$, $p < .01$). No other differences were indicated.

Zero-Inflated Poisson Model

Results for the ZIP analyses are provided in Table 2. While all behavioral decision-making variables and covariates were assessed as predictors of both the logistic and the count portion of the model, none of the variables were significant in the logistic portion, thus they were trimmed from the model. Willingness to RWDD and typical weekly drinking were both associated with increased odds of RWDD (OR = 1.58 and 1.40, respectively), whereas intentions to use alternatives, sex, and ethnicity were not associated with subsequent odds of RWDD behavior. Only typical weekly drinking was associated with Decline behavior, with an increase of drinking associated with increased odds of Decline (OR = 1.48).

Correlational Analyses

Correlations between the behavioral-decision making variables and the psychosocial variables can be found in Table 3. All psychosocial variables were significantly correlated

with both behavioral decision-making variables, except positive expectancies which were only correlated with willingness to RWDD. Several of the psychosocial variables had moderate to moderately high correlations with the behavioral decision-making constructs (r 's 0.30- 0.65) including attitudes, injunctive norms, prototypes, and self-efficacy.

Discussion

The current study sought to systematically examine theoretical predictors of RWDD and Decline behaviors in college students. Consistent with past research (Hultgren et al., 2015) and the current study's hypotheses, willingness to RWDD significantly predicted increased RWDD. However, contrary to our hypotheses, intentions to use alternatives was not associated with RWDD behavior. This result, coupled with past research, suggests that willingness to RWDD is a robust predictor of RWDD behavior. Further, it indicates that while students may intend to use different alternatives to RWDD, they are still at risk to RWDD if they have some willingness to do so.

There are several potential explanations for why intentions to use alternatives may not be a unique predictor of RWDD behavior. First, students may differ on how well they plan to use alternative transportation. Not all students with high intentions to use alternative transportation may plan for the cost or time constraints of those transportation options. Second, the current study assessed intentions to use alternatives in the next year, but these intentions may not account for contextual variability across occasions. Intentions likely fluctuate as a function of how much money a student has to spend on transportation, as well as the timing and distance of travel. In general, assessing intentions to use alternatives for the year may not be sensitive enough to predict its potential association with RWDD behavior. Future studies are needed that assess these behavioral decision making constructs more frequently to account for temporal and contextual variability.

Results also indicated that neither behavioral decision-making construct was associated with Decline behavior. This suggests that, while declining a ride is related to RWDD, the decision to Decline may function through different processes than those associated with RWDD. Consistent with decision-making theories, which suggest specificity of questions, willingness and intentions to *decline a ride* may be more appropriate predictors of Decline behavior (Ajzen and Fishbein, 1980). These findings may also have contextual implications. For example, individuals who plan to use alternative transportation may verbalize this plan and receive fewer offers for a ride from those who have been drinking. Interestingly, typical weekly drinking was positively associated with increased Decline behavior. Students who drink more may be around more people who drink frequently, and thus have more offers to RWDD and opportunities to Decline. With rates of Decline higher than RWDD, this behavior represents a potentially fruitful avenue to reduce RWDD. Future research should examine predictors of both active declining (i.e., saying no to the ride) and passive declining (e.g., avoiding individuals who may ask them to RWDD), as well as planning to use alternative transportation. Many of these factors are contextual and may change day-to-day and possibly moment-to-moment, suggesting the need for daily diary or ecological momentary assessment of these factors to understand Decline behavior and its relationship toward drinking and RWDD.

The last aim of the study was to explore modifiable psychosocial variables and their association with decision-making variables regarding RWDD and Decline. These results give insight into factors that may be important to address in interventions. All of the psychosocial variables, except positive expectancies, were significantly correlated with both decision-making variables; however, these associations varied in strength. Attitudes, both toward RWDD and toward alternatives, had the strongest correlations with decision-making variables. It is important to note that students' attitudes toward RWDD were mostly negative. This suggests that even a slight positive inclination of attitudes may impact the decision to RWDD. Results also suggest certain psychological variables are more strongly correlated with willingness to RWDD (e.g., peer, maternal and paternal norms) and others are more strongly correlated with intentions to use alternatives (e.g., risk-avoidance image prototype). While intentions to use alternatives were not associated with RWDD, decision-making constructs may still impact other influences on RWDD behavior, as suggested by their negative correlation with RWDD psychosocial variables. Lastly, it is possible that prevention and intervention programs could decrease RWDD by strengthening the effects of intentions to use alternatives and decreasing the effects of willingness on RWDD behavior. Future research should examine these potential relationships.

Prevention Implications

Based on the current study's results, there are several possible suggestions for prevention and intervention of RWDD. Future work is needed to examine if these interventions are efficacious in reducing RWDD behavior through the mechanisms described.

Brief motivational interventions (BMI) have been shown to reduce college student alcohol consumption and alcohol-related problems (Dimeff et al., 1999; Larimer and Currence, 2007) and may also work to reduce RWDD and increase use of alternatives. BMI uses specific techniques that encourage individuals to be actively involved in developing solutions for behaviors viewed as problematic (Borsari and Carey, 2000; Dimeff et al., 1999). BMI focused on impaired driving could help students identify negative attitudes toward RWDD, positive attitudes toward alternatives, and also help students increase their self-efficacy to use alternatives over RWDD. Changing these psychosocial variables may then impact willingness and intentions and subsequently behavior. Additionally, BMI may help students identify barriers to using alternatives, such as the timing, price, and reliability of alternative transportation, and potential ways students can overcome these barriers.

Significant associations between norms and image prototypes with decision-making constructs suggest potential efficacy for normative feedback interventions and Parent Based Interventions (PBIs) adapted to address RWDD. Students reported their parents and peers engaged in more RWDD than they reported for themselves. This is consistent with past research indicating individuals often misperceive others are engaging in risky behaviors more often than they actually are (Lewis et al., 2007). Normative feedback works to correct normative misperceptions (Lewis and Neighbors, 2006), and may be useful in correcting students' perceptions of parent and peer RWDD. For image prototype, normative feedback may be able to address students' conflicting positive feelings toward both people who RWDD and people who use alternatives, and how that relates to their own decisions to

RWDD. PBIs utilize students' parents to deliver material as a way to elicit change or prevent risky behavior such as risky drinking (Testa et al., 2010; Turrissi et al., 2013). Past research has shown that parents influence prototypes by communicating their own prototype perceptions, and PBIs may be able elicit this communication to change RWDD (Brody et al., 2004; Gibbons et al., 2004).

Limitations and Future Directions

While the current study has strengths, it also has limitations. First, there are several contextual factors that may influence in-the-moment decisions to RWDD or Decline. Such factors include, but are not limited to, relation to the driver (e.g., peer, parent, significant other), level of intoxication of the potential passenger, weather, time of night, price and access to transportation, and distance needed to travel. Ideally, prevention efforts will be able to decrease the decisions to RWDD regardless of contextual changes; however, research should examine how these factors influence the decision-making process to address them in interventions. Brief interventions may be able to utilize different techniques to address these contextual concerns. To reduce potential effects of contexts on RWDD and Decline behavior, brief interventions may incorporate components such as preplanning for safe travel, behavioral rehearsal of declining RWDD and behavioral inoculation to increase the salience of the risk of RWDD among different contexts including environments and physiological states (e.g., student's own level of intoxication). Including behavioral decision making theories in the development of brief interventions can provide a more comprehensive approach. The processes and mechanisms of the intervention can be examined by assessing changes in behavioral decision-making components and their effects on RWDD and Decline behavior.

Second, RWDD and Decline behaviors were assessed over the past year and therefore were subject to issues such as recall bias. Additional research is needed with shorter time assessments such as monthly data collection, daily diary or ecological momentary assessments. RWDD and Decline behavior was also assessed by asking students to subjectively assess if the driver had too much to drink. Thus, behavior is most likely higher than reported in the current study, as students may have ridden with an impaired driver without deeming them too drunk to drive. Lastly, the current study did not include driving services such as Uber or Lyft as possible alternatives. Since these services are increasingly being used more than traditional taxi services, future work should assess how availability and use of these services impacts RWDD and Decline behavior.

The current study assessed students once a year in their 3rd and 4th years of college, and therefore assessing behavioral decision-making factors as mediators of psychosocial variables was not possible. Future works should continue to assess how willingness and psychosocial variables are associated with future RWDD behavior. Research is also needed to assess whether these associations are consistent across all 4 years of college and in non-college populations. Continued refinement of the measurement of RWDD and Decline behavior is needed in future studies. Individuals should be assessed on the number of opportunities they have to accept or decline a ride from a drinking driver and whether the

associations found in this study differ among individuals who had the opportunity compared to those who were never in a situation when RWDD was a possibility.

Conclusions

In sum, the current study provides support that willingness to RWDD is a robust predictor of RWDD behavior 1 year later in older college students. Results provide several suggestions for prevention implications and future directions to understand and reduce RWDD.

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Figure 1.

Heuristic Model for Zero-Inflated Poisson Analyses.

Note: Solid lines indicate hypothesized positive association and dotted lines indicate hypothesized negative associations.

Table 1.

RWDD and Decline Behavior by Sex, Race, and Ethnicity

Demographic	Number of Times RWDD in the Past Year							χ^2
	None (zero)	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times	
Sex								8.40
Male	229 (84.5%)	33 (12.2%)	7 (2.6%)	1 (0.4%)	0 (0.0%)	0 (0.0%)	1 (0.4%)	
Female	400 (88.5%)	42 (9.3%)	4 (0.9%)	4 (0.9%)	1 (0.2%)	1 (0.2%)	0 (0.0%)	
Race								8.05
White	465 (85.2%)	66 (12.1%)	8 (1.5%)	4 (0.7%)	1 (0.2%)	1 (0.2%)	1 (0.2%)	
Non-White	162 (92.6%)	9 (5.1%)	3 (1.7%)	1 (0.6%)	0 (0.0%)	0 (0.0%)	0 (0.0%)	
Ethnicity								8.39
Non-Hispanic	540 (87.0%)	64 (10.3%)	11 (1.8%)	4 (0.6%)	0 (0.0%)	1 (0.2%)	1 (0.2%)	
Hispanic	89 (87.3%)	11 (10.8%)	0 (0.0%)	1 (1.0%)	1 (1.0%)	0 (0.0%)	0 (0.0%)	
Demographic	Number of Times Declined in the Past Year							χ^2
	None (zero)	1-2 times	3-4 times	5-6 times	7-8 times	9-10 times	11 or more times	
Sex								3.76
Male	192 (70.6%)	62 (22.8%)	11 (4.0%)	5 (1.8%)	1 (0.4%)	0 (0.0%)	1 (0.4%)	
Female	329 (72.9%)	100 (22.2%)	17 (3.8%)	2 (0.4%)	1 (0.2%)	0 (0.0%)	2 (0.4%)	
Race								17.74**
White	375 (68.7%)	138 (25.3%)	25 (4.6%)	5 (0.9%)	2 (0.4%)	0 (0.0%)	1 (0.2%)	
Non-White	144 (82.3%)	24 (13.7%)	3 (1.7%)	2 (1.1%)	0 (0.0%)	0 (0.0%)	2 (1.1%)	
Ethnicity								3.11
Non-Hispanic	446 (71.7%)	141 (22.7%)	25 (4.0%)	6 (1.0%)	1 (0.2%)	0 (0.0%)	3 (0.5%)	
Hispanic	75 (74.3%)	21 (20.8%)	3 (3.0%)	1 (1.0%)	1 (1.0%)	0 (0.0%)	0 (0.0%)	

Note:

**
 $p < .01$

Table 2.

Results for Zero-Inflated Poisson Analyses of RWDD and Decline Behavior

Predictor	RWDD		Decline	
	Estimate (S.E.)	Odds Ratio	Estimate (S.E.)	Odds Ratio
Intentions to Use Alternatives	−0.07 (0.19)	0.93	0.00 (0.09)	1.00
Willingness to RWDD	0.46 (0.15) **	1.58	0.09 (0.06)	1.09
Typical Weekly Drinking	0.34 (0.12) **	1.40	0.39 (0.06) ***	1.48
Sex	0.20 (0.23)	1.22	0.16 (0.16)	1.17
Race	−0.63 (0.32) *	0.53	−0.15 (0.26)	0.86
Ethnicity	−0.18 (0.33)	0.84	0.13 (0.21)	1.14

Note:

*
 $p < .05$,**
 $p < .01$,***
 $p < .001$

Table 3.

Bivariate Correlations between Psychosocial and Decision-Making Variables

Variable	Willingness to RWDD	Intentions to Use Alt
RWDD Attitudes	0.61 ***	−0.41 ***
Alt. Attitudes	−0.37 ***	0.65 ***
Positive Expectancies	0.11 **	0.03
Negative Expectancies	−0.23 ***	0.29 ***
Peer Descriptive Norms	0.25 ***	−0.16 ***
Peer Injunctive Norms	0.40 ***	−0.25 ***
Parent Descriptive Norms	0.24 ***	−0.11 **
Parent Injunctive Norms	0.35 ***	−0.19 ***
RWDD Prototype	0.41 ***	−0.32 ***
Alt. Prototype	−0.18 ***	0.38 ***
Self-Efficacy to Use Alt.	−0.22 ***	0.50 ***

Note:

**
 $p < .01$,***
 $p < .001$