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Adolescent Alcohol-Related Risk Cognitions: The Roles of Social Norms and Social Networking Sites
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Adolescent Alcohol-Related Risk Cognitions: The Roles of Social Norms and Social Networking Sites

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The present study examined the impact of socially based descriptive norms on willingness to drink alcohol, drinker prototype favorability, affective alcohol attitudes, and perceived vulnerability for alcohol-related consequences within the Prototype Willingness model. Descriptive norms were manipulated by having 189 young adolescents view experimenter-created profile pages from the social networking site Facebook, which either showed older peers drinking or not. The results provided evidence that descriptive norms for alcohol use, as portrayed by Facebook profiles, significantly impact willingness to use, prototypes, attitudes toward use, and perceived vulnerability. A multiple mediation analysis indicated that prototypes, attitudes, and perceptions of use mediated the relationship between the content of the Facebook profile and willingness. These results indicate that adolescents who perceive that alcohol use is normative, as evidenced by Facebook profiles, are at higher risk for cognitions shown to predict alcohol use than adolescents who do not see alcohol use portrayed as frequently on Facebook.

Keywords: adolescent, alcohol use, social norms, social networking sites, Prototype Willingness Model

Alcoholic beverages are the most widely used substances by American adolescents (Johnston, O’Malley, Bachman, & Schulenberg, 2010). Adolescents who report drinking alcohol by age 13 are more likely to report academic problems, other substance use problems, and delinquent behavior (Substance Abuse & Mental Health Services Administration, 2008). Adolescents ages 13–15 are also the age group that is most at risk to initiate drinking (National Institute on Alcohol Abuse & Alcoholism, 2008). These statistics highlight the importance of studying the social–cognitive antecedents of alcohol use among younger adolescents. Research has indicated that alcohol-related social cognitions and behavior can be shaped through perceived descriptive norms (Borsari & Carey, 2001; Gerrard, Gibbons, Houlihan, Stock, & Pomeroy, 2008). The present study examined the role that normative information conveyed via social networking sites plays on the alcohol-related risk cognitions of adolescents.

The Importance of Descriptive Social Norms

Descriptive normative perceptions are defined as people’s perceptions of how most people behave in given situations (Borsari & Carey, 2001; Lapinski & Rimal, 2005). Several researchers have argued descriptive norms are among the most important predictors of adolescent risk behavior (Beal, Ausiello, & Perrin, 2001; D’Amico & McCarthy, 2006) and should be included in models of adolescent health risk behavior (e.g., Rivis & Sheeran, 2003; Gerrard et al., 2008). In addition, several reviews of social norms related to alcohol use have indicated that adolescents’ beliefs about whether or not their peers use alcohol is significantly related to their own use (Borsari & Carey, 2001; Lewis & Neighbors, 2006).

Norms and Older Peers

Research has shown that younger adolescents often consider the normative behavior of older peers when making risk decisions (Kinsman, Romer, Furstenberg, & Schwarz, 1998). Adolescents who have older peer groups are at greater risk for alcohol and other substance use than adolescents who do not have older peers (Grant, Bucholz, Madden, Slutske, & Heath, 1998). Moreover, associating with older peers may accelerate social development, resulting in a higher percentage of adolescents reporting alcohol use at earlier ages (Stattin, Gustafson, & Magnusson, 1989).

Facebook Use and Normative Perceptions

Previous research has indicated that media exposure has an impact on the normative perceptions of substance use among adolescents (e.g., Wills, Sargent, Gibbons, Gerrard, & Stoolmiller, 2009). One increasingly popular form of media is social networking sites, such as Facebook. Currently, there are more than 500 million active Facebook users worldwide (Zuckerberg, 2008). Among adolescents ages 12–17, there has been a 149% increase in new members over the last two years (Corbett, 2010). Communication on Facebook is facilitated through information posted in the profile (i.e., the member’s personal page), which often includes photographs of the member, information describing their interests, and messages posted by themselves or their friends. The most common information that adolescents report viewing about friends are photos and comments (Pempek, Yermolayeva, & Calvert, 2009). Research has indicated that 25–37% of older adolescents...
post information related to alcohol use on their profile (Moreno, Parks, Zimmerman, Brito, & Christakis, 2009; Moreno, Parks, & Richardson, 2007). Based on the content of these photos and comments, adolescents may develop a perception of how normative alcohol use is among peers of varying ages, including older peers. Given that having older friends is associated with substance use among adolescents (e.g., Leatherdale, Cameron, Brown, Jolin, & Kroeker, 2006), it is important to determine how viewing profiles of older peers who use alcohol influences adolescents’ normative perceptions and other alcohol-related risk cognitions.

**Prototype Willingness Model (PWM)**

To examine the impact of social norms conveyed via social networking sites, the present study utilizes the PWM framework (see Gerrard et al., 2008, and Gibbons, Gerrard, & Lane, 2003, for a full description of the model). The PWM is a modified dual-process model that focuses on the cognitions that mediate the effects of environmental and social factors on risk-taking behaviors. This model assumes that there are two pathways to health risk behavior: a reasoned path mediated by behavioral intention and a social reaction path mediated by behavioral willingness. A central tenet of the model is a belief that not all health behaviors are planned or intentional, especially risk behaviors among adolescents and young adults (Rivis, Sheeran, & Armitage, 2006). Instead, these behaviors may be reactions to risk-conducive social situations that they often encounter (Gibbons et al., 2003). These reactions are captured in behavioral willingness, which assesses what an individual would be willing to do under certain circumstances. Willingness is a strong predictor of substance use and helps explain additional variance in behavior beyond intentions, including among those who have not yet engaged in the behavior (Gerrard et al., 2008; Gibbons, Gerrard, Blanton, & Russell, 1998).

Social norms are a central part of the PWM and have been shown to predict all other key aspects of the model. Previous research has found that perceived descriptive norms are associated with: greater willingness to engage in drug and alcohol use (Gibbons, Helweg-Larsen, & Gerrard, 1995; Blanton, Gibbons, Gerrard, Conger, & Smith, 1997; Pomery et al., 2005), more favorable images of the typical drinker (i.e., prototypes; Blanton et al., 1997), and lower perceived vulnerability to the consequences of risky substance use (including drinking) behavior (Gerrard et al., 2008). Although attitudes are a key part of the PWM (operationalized as perceived vulnerability), it is possible that affectively based attitudes (e.g., how one feels rather than how one thinks; Slovic, Finucane, Peters, & MacGregor, 2002) are a likely candidate for interaction with other key social reaction pathway variables due to their heuristic nature. For example, believing that a majority of one’s peers are using alcohol will likely be associated with more positive affective attitudes (e.g., “If most of my peers are using alcohol, it must be good”). Based on the importance of social norms within the PWM, it is important to determine the mechanism through which they may have an impact on alcohol-related risk cognitions in adolescents.

**Present Study**

The present study investigated the role that descriptive norms play on willingness to use alcohol, prototype favorability, perceived vulnerability for alcohol-related consequences, and affective-based attitudes toward alcohol use. Descriptive norms were manipulated by having adolescents either view Facebook profiles that portrayed alcohol use as normative, or view Facebook profiles that did not portray alcohol use as normative. It was hypothesized that there would be a main effect of the norm manipulation such that participants in the user condition (those who view primarily user profiles) would report greater perceptions of older peer alcohol use and willingness to use alcohol, have more favorable prototypes of alcohol users and affective attitudes toward alcohol use, and lower perceived vulnerability compared to participants in the control condition. In addition, a multiple mediation analysis (Preacher & Hayes, 2008) was conducted to determine if prototype favorability, perceived vulnerability, affective attitudes, and normative perceptions mediated the relationship between Condition (alcohol use as normative vs. control) and willingness, as would be predicted by the PWM.

**Method**

**Participants**

One hundred eighty nine adolescents, ages 13–15 ($M = 14.5$ years, $SD = .77$), completed the study (49% males). Participants were from five private high schools, a swim team, and a church youth group. Due to Institutional Review Board (IRB) restrictions, ethnicity data was not collected. The majority of participants (73%) reported ever drinking alcohol and 88% reported having a Facebook account. The modal response for time spent on Facebook was at least one hour/week.

**Procedures**

To access the population of interest, the researcher contacted local schools and community organizations and informed them about the present study. Once the school or organization consented to participate, information packets and a parental consent form were sent home to parents of any adolescent aged 13–15. On the day of data collection, any adolescent who had a signed parental consent form was allowed to participate if they signed their own consent form. All procedures and materials were approved by the IRB.

**Administration**

Participants were randomly assigned (on an individual basis) to one of two Facebook conditions: (1) alcohol user condition; (2) control condition. They were told that they would have 40 minutes to view Facebook profiles of high school students and that they would rate them on a series of personality traits. Participants assigned to the alcohol user condition viewed Facebook profiles (fabricated by the researcher) of three high school students who were shown drinking alcohol and one profile of a high school student...
student who was not shown drinking alcohol. The adolescents assigned to the control condition viewed the profiles of three high school students who were not shown drinking alcohol and one alcohol user. The same four students were used in each condition, but whether or not they were drinking was manipulated. Prior to the study, all profiles were viewed by adolescents familiar with Facebook to determine if the content was realistic and appropriate. Participants only viewed same-sex profile pages, profiles of White students (chosen based on the racial background of participating schools), and each profile page had the student’s birthday listed and participants were informed that the profiles were of students who were 2 years older than themselves. Each profile page included three photos of the student and a series of comments left on their Facebook page by “friends” (also fabricated). Comments on the user condition pages alluded to a past drinking incident or future desire to drink alcohol (e.g., “You were so drunk last night”). The comments on the profile pages that did not include drinking were focused around social activities (e.g., “Do you want to go to the movies tonight?”). After viewing the profiles, alcohol-related cognitions were assessed. Finally, all adolescents were debriefed and given information on the dangers of alcohol use.

**Measures**

Participants completed measures typically used in PWM studies in adolescent populations, including willingness to use alcohol (3 items; $\alpha = .93$; Gerrard et al., 2006), perceived favorability of and similarity to the typical person their age and gender who uses alcohol (7 items; $\alpha = .85$; Gerrard et al., 2006), affective attitudes toward alcohol use (5 items; $\alpha = .87$; Slovic et al., 2002), perceived vulnerability to the negative consequences of use (3 items; $\alpha = .82$; Gerrard et al., 2006), and normative perceptions of alcohol use among older peers (2 items; $\alpha = .88$). In addition, participants responded to a single item assessing whether they had ever used alcohol. Participants also reported how much time per week (on average, over the last 3 months on a 5-point scale ranging from never to more than 2 hours) they spent on Facebook.

**Results**

**Correlations**

As presented in Table 1, greater normative perceptions of alcohol use among older peers were associated with greater willingness, more favorable user prototypes, more positive attitudes toward alcohol use, older age, and past use (all $p < .05$). As expected, there were significant intercorrelations between all primary variables within the PWM (all $p < .05$). Finally, more time spent on social networking sites was associated with: greater normative perceptions of use and willingness to drink, more favorable prototypes, and more positive attitudes ($p < .05$).

**MANCOVAs**

**Randomization of covariates.** A General Linear Modeling (GLM) Multivariate Analysis of Covariance (MANCOVA) was conducted to examine condition randomization of the covariates (included in all analyses): age, gender, past alcohol use, school site, and hours on Facebook. No significant condition effects were found for any covariates (all $F_s < .8$, $p_s > .05$).

**Condition effects on primary dependent variables.** A MANCOVA was conducted using standardized variables (due to differences in scales), but for the sake of clarity, unstandardized means are reported in Table 2. Results revealed a significant main effect of Condition, Wilks’ $F = 2.84, p < .01$, such that adolescents in the alcohol user condition reported higher levels of all risk-promoting cognitions. Univariate results indicated a significant Condition effect for willingness, such that adolescents who viewed Facebook profiles that portrayed alcohol use as normative reported greater willingness to drink alcohol ($F(1, 189) = 6.73, p = .01, d = .58$). Results also revealed that adolescents in the alcohol user condition (compared to those in the control condition) reported: more favorable prototypes of alcohol users ($F(1, 189) = 4.22, p = .02, d = .66$), more favorable attitudes toward alcohol use ($F(1, 189) = 4.45, p = .04, d = .37$), lower perceived vulnerability to the consequences of alcohol use ($F(1, 189) = 5.00, p = .03, d = .40$), and greater levels of perceived norms for alcohol use among high school students ($F(1, 189) = 7.89, p = .01, d = .73$). Past alcohol use, age, and time spent on Facebook were associated with greater willingness to use alcohol, more positive user prototypes and attitudes toward alcohol use, and lower perceived vulnerability (all $F_s > 5, p_s < .05$). In addition, females reported higher levels of perceived vulnerability ($p < .05$).

**Multiple Mediation**

Using a bootstrap estimation multiple mediation analysis (SPSS 18.0 macro by Preacher & Hayes, 2008), Condition (alcohol user vs. control) was entered as the independent variable; willingness to use alcohol was entered as the dependent variable; and prototypes, attitudes, perceived vulnerability, and perceived descriptive norms were all entered as proposed mediators. Data collection site, past alcohol use, age, gender, and time spent on Facebook were entered as covariates. Results indicated that the total effect of Condition on willingness (total effect = .34, $p = .01$) became nonsignificant when the mediators (user prototypes, attitudes, perceived norms, and perceived vulnerability) were included in the model (direct effect of condition = .07, $ns$). Furthermore, the analyses revealed, with 95% confidence, that the total indirect effect (i.e., the difference between the total and direct effects) of Condition on the outcome variable through the four mediators was significant, with a point estimate of .27 and a 95% BCA (bias-corrected and accelerated; see Preacher & Hayes, 2008) bootstrap confidence interval of .098 to .472. Thus, three of the four mediators fully mediated the association between Condition and willingness.

The specific indirect effects of each proposed mediator showed user prototypes, with a point estimate of .09 and 95% BCA CI of .011 to .197; attitudes with a point estimate of .111 and 95% BCA CI of .018 to .248; and perceived norms, with a point estimate of .043 and 95% BCA CI of .011 to .101 were all unique mediators;
whereas perceived vulnerability with a point estimate of \(-0.029\) and 95% BCa CI of \(-0.005\) to \(0.101\), did not add to the overall model. In sum, the bootstrap analyses indicate that user prototypes, attitudes, and perceived norms mediate the link between Condition and willingness to use alcohol (see Figure 1 for full mediational model).

**Discussion**

As hypothesized, adolescents who viewed Facebook profiles that portrayed alcohol use as normative among older peers reported greater willingness to use alcohol, more favorable images of alcohol users, more positive affective attitudes toward alcohol use, lower perceived vulnerability to the consequences of drinking alcohol, and greater perceived norms of alcohol use compared to adolescents who viewed profiles that did not portray alcohol use as normative. In addition, the results indicated that viewing Facebook profiles conveying that alcohol use is normative among older peers had an indirect effect on willingness to use alcohol through positive prototypes, favorable attitudes toward alcohol use, and normative perceptions of alcohol use. Overall, the results provide further evidence for the assertion that descriptive normative perceptions influence risky health cognitions in adolescence and should be included in models of health risk behavior (Gerrard et al., 2008; Rivis et al., 2006).

Notably, this is the first study to examine the impact of manipulated descriptive norms within the context of the prototype willingness model and provides evidence that perceived norms, at least in this age group, predict multiple risk-related cognitions. In addition, the present study provides evidence that viewing social norms of a risk behavior, even through a social networking site, sets in action a series of risky cognitions shown to predict alcohol use. Seeing Facebook profiles that portrayed 75% of older peers using alcohol versus only seeing 25% using alcohol had a significant impact on adolescents’ general perceptions of use among high school students. The percentage of profiles that portrayed alcohol use were similar to adolescents’ reports of perceived use among high school students. Thus, it appears that alcohol use norms portrayed via Facebook could be generalized to high school students as a whole.

**Intervention Implications and Future Research**

Researchers and public health officials have cited adolescent alcohol use as a major public health concern (Johnston et al., 2010; NIAAA, 2008), and as such have called for research that can inform prevention practices for adolescents. One of the most important implications of the present study is that descriptive norms should be included in adolescent alcohol interventions based on their influence on several key risk cognitions. Research evaluating personalized normative feedback, which presents individuals with their own discrepancies between perceived norms and actual norms for a behavior, has found that this approach is effective at reducing alcohol use and risk cognitions (Lewis & Neighbors, 2006; Neighbors, Larimer, & Lewis, 2004).

Another interesting finding is that the normative influence of older peers had a significant impact on risk cognitions in adolescents ages 13–15. This is not surprising given that adolescents often look to the behavior of older peers when determining their own behavior (Kinsman et al., 1998; Grant et al., 1998). A recent

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<td>56.13</td>
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**Note.** N = 189.

*p < .05.  **p < .01.

**Table 2**

**Dependent Variable Means by Condition**

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<tr>
<th>User Condition</th>
<th>Willingness</th>
<th>User prototype</th>
<th>Attitudes</th>
<th>Perceived vulnerability</th>
<th>Perceived norms (%)</th>
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<tbody>
<tr>
<td>User Condition</td>
<td>2.54</td>
<td>6.89</td>
<td>2.53</td>
<td>5.59</td>
<td>71.22</td>
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<tr>
<td>Control Condition</td>
<td>1.99</td>
<td>6.18</td>
<td>2.17</td>
<td>5.94</td>
<td>29.13</td>
</tr>
</tbody>
</table>

**Note.** N = 189.
study found that the European Drug Addiction Prevention program, which included speaking to adolescents aged 12–14 about the alcohol consumption of older adolescents and how they may be misperceiving the descriptive norm, delayed progression to frequent drinking and reduced the occurrence of alcohol-related behavioral problems (Caria, Faggiano, Bellocco, & Galanti, 2011). A natural extension of this paradigm based on the present study would be to include discussions of how Facebook and other social networking sites may be inaccurately portraying the alcohol use of older peers and to highlight these misperceptions.

In light of the findings that exposure to Facebook profiles that contain alcohol and greater time spent on Facebook both predict riskier cognitions as evidenced by correlations and results of the primary analyses, it is important for interventions to consider the role that Facebook and other social networking sites may play on risk cognitions and behavior. In addition, this study provides evidence that perceived descriptive norms for alcohol use among adolescents may be malleable via social networking profiles and influence multiple risk cognitions outlined in the prototype willingness model. This study demonstrates the need to consider an individual’s perceptions of use based on the content they view on online social networking sites and suggests that certain individuals, specifically those who perceive that a majority of their peers are using alcohol, may be particularly at risk for using alcohol themselves, and as such are logical targets for prevention efforts.

Given that social networking sites are increasingly playing a large role in adolescents’ lives, future research should continue to examine the mechanisms through which such sites may exert influence on risk-related cognitions. Because social networking sites are more interactive and repetitive than other types of media (e.g., TV and film), and contain images of actual peers, the risks related to social networking sites may be greater than other forms of media. In addition, it is likely that adolescents may selectively view profiles, so future research should examine the way in which real-world usage of Facebook may impact risk cognitions. There is also a need for longitudinal studies to fully examine the mediating processes, changes in cognitions and behaviors, as well as actual substance use. Finally, additional research should be conducted in order to determine if viewing profiles of alcohol abasters reduces alcohol-risk-related cognitions or if the impact of such information is negligible.

**Limitations**

In spite of the findings derived from the present study, there are limitations that need to be addressed. First, it is important to note that testing mediation using cross-sectional data, as done in the present study, may generate biased estimates (Maxwell & Cole, 2007). Furthermore, although research shows that descriptive norms have an influence on the behavior of adolescents from varying racial groups (Larimer et al., 2009), our data cannot say if the findings would be the same for adolescents of differing racial/ethnic backgrounds. In addition, although descriptive normative perceptions were shown to potentially be malleable in this age group, research has shown that as adolescents enter young adulthood, they are less susceptible to social influences, including peer norms (Steinberg & Monahan, 2007; Sumter, Bokhorst, Steinberg, & Westenberg, 2009). It is therefore possible that our results would not hold for older populations. In addition, due to time constraints, we only asked a lifetime drinking question, which reduces our ability to discuss the impact of past drinking behavior (e.g., quantity and frequency) on the risk cognitions included in the present study. Finally, because the present study included only students from private schools and organizations, it is unclear whether the results would generalize to adolescents as a whole.

**Conclusion**

The present study provides evidence that alcohol use descriptive norms, via the social networking site Facebook, influences risk cognitions related to alcohol use. In addition, the results provide evidence that perceived descriptive norms for alcohol use conveyed via social networking profiles possibly influence multiple risk cognitions outlined in the prototype willingness model. Finally, our findings suggest that adolescents who view substance use images on social networking sites and perceive that a majority of their peers are using alcohol, may be particularly at risk for using alcohol, and as such are logical targets for prevention efforts.

**References**


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