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2015

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Abstract

Parents impact adolescent substance abuse, but sex-specific influences are not well-understood. This study examined parental influences on adolescent drinking behavior in a sample of 9th grade students ($N = 473$). Hierarchical regression analyses indicated parental monitoring, disapproval of teen alcohol use, and quality of parent-teen general communication were significant predictors of drinking behaviors. Sex, however, moderated these relationships. Specifically, parental monitoring was protective of heavy episodic drinking and alcohol-related consequences for females, whereas parental disapproval of teen alcohol was protective of heavy episodic drinking for males. Implications for sex-specific parent-based intervention programs are discussed.

Keywords: adolescent drinking, parental influences, sex differences, high school

Adolescence represents a developmental period which presents unique challenges for families. In particular, the transition to high school is often associated with an increase in risky decision-making and behavior (D'Amico, Elickson, Collings, Martino, & Klein, 2005; D'Amico & Fromme, 2000; Albert & Steinberg, 2011). Neuroimaging studies indicate that many social brain regions continue to develop during adolescence resulting in an increased vulnerability to risky behavior (Burnett, Sebastian, Kadosh, & Blakemore, 2010). Additionally, as children develop from pre-adolescence to adolescence, there is a natural tendency to strive for independence from the family. During this time, adolescents try new behaviors and may find themselves in risky situations as parental authority is tested (D'Amico & Fromme, 2000).

One type of risky behavior that emerges in adolescence is alcohol use. According to national survey data, a substantial increase in drinking occurs during the transition from middle school to high school. Specifically, alcohol use nearly doubles between 8th and 10th grade, with 13% of 8th grade students reporting alcohol use in the past 30 days compared to 27% of students in the 10th grade (Johnston, O'Malley, Bachman, & Schulenberg, 2012a). Additionally, binge drinking in high school is associated with multiple problems including academic difficulties, riding with a driver who has been drinking, being sexually active, smoking tobacco, using other drugs, being a victim of dating violence, and attempting suicide (Miller, Naimi, Brewer, & Jones, 2007). Further, youth who drink heavily during their teen years continue this pattern into college and early adulthood (D'Amico et al., 2005; Kenney, Hummer, & LaBrie, 2010) and are at risk for developing alcohol and drug problems (Chassin, Pitts, & Prost, 2002; Hingson, Heeren, & Winter, 2006).

Additionally, relative to males, the rate of alcohol use among adolescent females is rising. National survey data indicate that female past-year 30-day prevalence of drinking and 2-week prevalence of binge drinking among 8th graders has surpassed that of males (Johnston, O'Malley, Bachman, & Schulenberg, 2012b). Although adolescent drinking is associated with many adverse consequences for both sexes, among adolescent females, alcohol use is associated with risky sexual behavior, unsafe sex, unintended pregnancy, dating violence, and sexual victimization

(Champion, Foley, DuRant, Hensberry, Altman, & Wolfson, 2004; Miller et al., 2007; Poulin & Graham, 2001). Thus, it is imperative to understand sex-specific factors related to heavy episodic drinking and the negative associated consequences among adolescents to guide prevention and intervention programs for this age group.

Parental Influences on Adolescent Alcohol Use

Several individual level social, emotional, and cognitive factors have been identified as risk and protective factors for adolescent alcohol use. Parental influences are also important to consider in the development of adolescent alcohol use, as parenting is associated with alcohol misuse trajectories among adolescents (Barnes, Reifman, Farrell, & Dintcheff, 2000). Contrary to the widely held belief that parents lose their ability to influence their children in adolescence as peer relationships become primary, parents continue to influence their children throughout late adolescence (Wood, Read, Mitchell, & Brand, 2004; Turrissi, Wiersma, & Hughes, 2000). Although there is some evidence to suggest that peers influence adolescent alcohol use more than parents, other research indicates that problem drinking in adolescence is associated with parental attitudes and behaviors even when peer variables are accounted for (Arata, Stafford, & Tims, 2003; Kim & Neff, 2010; Wood et al., 2004). Consistent with family systems theory (Bowen, 1978), adolescent alcohol use may be viewed as a family issue, rather than individual problem, in which the parent-child relationship and parent-child interactions impact adolescent alcohol use.

Parental Monitoring

Parental monitoring has been identified as one of the most important risk factors for adolescent alcohol use (Svensson, 2000). Parental monitoring may be defined as the extent to which parents attempt to attend to, track or control their child's activities and whereabouts (Kerr & Stattin, 2000). Parental monitoring also reflects the degree of involvement of parents with their child, including the parent's awareness of their child's activities and friends, as well as the degree to which parents set and enforce clear standards for their child (Kim & Neff, 2010). Research indicates parental monitoring and parental involvement are related to lower levels of adolescent alcohol use (Barnes, Hoffman, Welte, Farrell, & Dintcheff, 2006; Luthar & Goldstein, 2008; Simons-Morton & Chen, 2005; Simons-Morton, Haynie, Crump, Eitel, & Saylor, 2001; Vakalahi, 2002; Van Der Vorst et al., 2006), heavy episodic drinking (Guilamo-Ramos, Turrissi, Jaccard, Wood, & Gonzalez, 2004; Kim & Neff, 2010; Reifman, Barnes, Dintcheff, Farrell, & Uhteg, 1998) and alcohol-related consequences (Arata et al., 2003). Further, parental monitoring is associated with adolescent beliefs and attitudes which, in turn, are associated with adolescent alcohol use (Kim & Neff, 2010). Research also indicates that high levels of parental monitoring, involvement, and expectations exert an indirect influence on the progression of adolescent alcohol use through limiting the growth in the number of drinking friends (Simons-Morton & Chen, 2005).

Parental Disapproval of Teen Alcohol Use

Parental disapproval has also been identified as one of the primary risk factors for the initiation of drinking in adolescence (Donovan, 2004). Parental disapproval of alcohol use may be communicated directly or indirectly through the setting of limits or by the expression of values regarding alcohol use (Wood et al., 2004). During the transition from childhood to adolescence, there is increasing divergence between parents' acceptance of adolescent alcohol use and adolescent acceptance of alcohol use by their peers (Prins, Donovan & Molina, 2011). Research indicates parental disapproval of drinking is associated with lower levels of alcohol use (Arata et al., 2003; Foley, Altman, Durrant, & Wolfson, 2004; Mares, Van Der Vorst, Rutgers, Engels, & Lichtwarck-Aschoff, 2011) and fewer alcohol-related consequences (Arata et al., 2003; Mares et al., 2011) among adolescents. Parental disapproval of teen alcohol use is also associated with peer risk factors such as involvement with friends who use, peer influence to use, and lower levels of alcohol use and alcohol-related problems (Nash, McQueen, & Bray, 2005).

Parent-Teen Communication

Parent-teen communication is considered to be a fundamental component of positive family functioning and is incorporated into most family-based interventions for teen drinking. Research examining the association between parent-teen communication and alcohol use, however, is mixed with studies indicating parent-teen communication is associated with higher levels of adolescent alcohol use (Van Der Vorst, Engels, Meeus, Dekovik, & Van Leeuwe, 2005; Van Der Vorst, Burk, Rutger, & Engels, 2010), lower levels of adolescent alcohol use (Ackard, Neumak-Sztainer, Story, & Perry, 2006; Guilamo-Ramos et al., 2004; Simons-Morton, 2004; Smetana, Crean & Daddis, 2002), or no relationship between communication and adolescent alcohol use (Ennett, Bauman, Foshee, Pemberton, Hicks,

2004). Explanations for the inconsistency of findings surrounding parent-teen communication are in part due to methodological differences across the studies (Van Der Vorst et al., 2010). Although the emphasis of prevention programs is often on improving parent-teen alcohol-specific communication rather than general communication, research indicates parent-teen communication regarding daily events, parental listening, parental communication of clear expectations contribute to an overall protective effect regarding drinking initiation (Simons-Morton, 2004). Further, perceived difficulty talking to parents about problems is associated with increased risk of substance use (Ackard et al., 2006).

Sex Difference in Parenting Influences on Alcohol Use

To date, there is limited research examining sex differences in the relationship of parental influences and adolescent drinking behavior. In general, the extant literature indicates differential sex effects for different types of parental influences. For example, research indicates parental commitment is inversely related to substance use for girls but is not related to substance abuse for boys (Luthar & Goldstein, 2008). Similarly, parent-child attachment (Crawford & Novak, 2008) and parental control and emotional support (Choquet, Hassler, Morin, Falissard, & Chau, 2008) are more strongly related to substance use in girls than boys. In contrast, research on parent-teen communication indicates parent-teen general communication is associated with less substance use among males, but not females (Guilamo-Ramos et al., 2004; Luk, Farhat, Iannotti, Simons-Morton, 2010). Research also indicates parent-teen alcohol-specific communication occurs more with sons than daughters and that the relationship between alcohol-specific communication and alcohol use is more robust for males than females (Van Der Vorst et al., 2010).

Parent-Based Interventions

Parent-based intervention programs targeting adolescent alcohol use generally focus on behavioral and attitudinal variables such as parental monitoring, involvement, and support, parental expectations and attitudes towards teen drinking, and general relationship variables such as parent-teen communication. Research indicates that combined student and parent-based interventions are effective in reducing alcohol use among middle school students (e.g. Spoth, Randall, Shin, & Redmond, 2005) and high school students (e.g. Konig et al., 2009). Because rates of alcohol use and the associated negative consequences are rising among adolescent females, sex-specific mother-daughter interventions have also been developed and tested with promising results (e.g. Schinke, Cole, & Fang, 2009; Schinke, Fang, & Cole, 2009). The parental component of this intervention focused on enhancing the quality of the mother-daughter relationship. Although this type of program represents an important step in developing sex-specific interventions, it is important to increase our understanding of sex-differences in the relationship between parental influences and adolescent drinking behavior in order to further refine the content and focus of sex-specific parent-based interventions.

The Current Study

Although the literature provides strong support for the relationship between parental influences and adolescent drinking behavior, this study extends the literature in several ways. First, this study examines the relationship between parent influences and drinking variables among 9th grade students. Examination of these relationships is particularly important for this age group as the largest increase in alcohol use and heavy drinking occurs between the 8th and 10th grade (Johnston et al., 2012a). Additionally, this is a time when autonomy increases (Bray, Adams, Getz, & Baer, 2001), marking a transition in the parent-teen relationship which is associated with an increase in risky behaviors, including alcohol use. Further, the parent-teen communication literature is limited as studies generally investigate either alcohol-specific or general parent-teen communication, rather than both simultaneously, and examine the frequency of communication without taking into account the perceived quality of the communication, or visa versa. This study extends the literature by examining the frequency and quality of both parent-teen alcohol-specific communication and parent-teen general communication within a multivariate model. Finally, many of the studies examining the association between parental influences and adolescent drinking behavior have not examined sex effects. Those that have investigated sex effects have found differences between boys and girls dependent upon the type of parental influence. Examination of sex-specific factors associated with adolescent drinking is warranted in order to develop sex-specific prevention and intervention program. In particular, understanding factors related to adolescent female alcohol use is imperative due to the escalation of drinking among adolescent females.

The aim of the current study is to extend the literature by examining sex-specific relationships between parental influences and adolescent drinking behavior in a sample of 9th grade students. The current study had two goals. First, we aim to investigate the unique relationships between parental influences (monitoring, disapproval of alcohol use,

the frequency and quality of parent-teen alcohol-specific communication, and the frequency and quality of parent-teen general communication) and adolescent drinking behavior (heavy episodic drinking and alcohol-related consequences). Second, we aim to test whether sex will moderate the relationship between parental influences and adolescent drinking behavior, thereby identifying sex-specific relationships between parental influences and adolescent drinking behavior that may guide prevention and intervention programming.

Method

Participants

Participants were 9th grade students recruited from two junior high schools in the northwest. All 9th grade students with parental consent who were present during the class in which recruitment occurred ($N = 538$) were given an opportunity to participate in the study. Of these, 513 agreed to participate and 473 reported their sex. Participant (53% female, 47% male) ages ranged from 13 to 16 ($M = 14.21$, $SD = 0.47$). Participants were primarily Caucasian (74.3%), with 9.9% Hispanic, 5.5% Asian, 4.6% African-American, 4.0% American Indian/Alaskan Native, and 1.7% Hawaiian/Other Pacific Islander.

Procedures

Schools were selected through convenience sampling. Parents of all 9th grade students enrolled in the schools that agreed to participate were contacted via letter by mail at their permanent addresses provided by the registrar's office. Enclosed in the letter was a project-addressed, stamped decline postcard. If a parent did not want their child to participate in the research project, they were asked to print their name and student's name and return the postcard indicating their option to decline. In addition, a phone number and email address were provided so that parents could decline their children's participation via phone or email. If the parent did not send in a decline postcard, call, or email, students were invited to participate in the study.

Students were recruited during class periods. Periods were selected so that all 9th grade students with parental consent who were present that day were given the opportunity to participate. At the start of the class, a school counselor described the research and invited students with parental consent to participate. Students who elected to participate were assigned a unique pin number and the URL for participation. Participants logged on to the survey website and were directed to a welcome screen describing the research and were asked to enter their PIN number. Once they entered the PIN, they were presented with the informed consent statement describing the study procedures and were asked to indicate their consent by clicking "Agree". If participants indicated their willingness to continue, they were routed to a baseline survey, which was completed immediately. This survey took approximately 15 minutes to complete. Students without parental consent and those who chose not to participate were given an alternative activity to complete during the class period. All study procedures were approved by the School District Research Board and the University Institutional Review Board approved analysis of data collected by the schools.

Measures

Heavy Episodic Drinking. Frequency of heavy episodic drinking was defined as consuming 4 or more drinks in a row for males (3 or more for females) in a 2 hour period during the last 2 weeks. The 4/3 quantity has been identified as appropriate for adolescents 14 – 15 years of age based on BAC levels for this age group (Donovan, 2009).

Alcohol-Related Consequences. Alcohol-related consequences were assessed using the Rutgers Alcohol Problem Index (RAPI, White & Labouvie, 1989). The RAPI is a 23-item self-administered screening tool for assessing adolescent problem drinking. Participants were asked "how many times have the following scenarios happened to you while you were consuming alcohol or as a result of your drinking in the past 30 days." Responses were measured on a 5-point scale ranging from never to more than 10 times. A total consequence score was created by summing the 23 items. The RAPI assesses both traditional consequences (e.g., tolerance, withdrawal symptoms, physical dependency) and consequences presumed to occur at higher rates in adolescent populations (e.g., missing school, not doing homework, going to school drunk). The RAPI has good internal consistency (Neal & Carey, 2004) and test-retest reliability (Miller et al., 2002) and has been correlated significantly with several drinking variables (White & Labouvie, 1989). Coefficient alpha for this sample was $\alpha = .90$.

Parental Monitoring. Parental monitoring was assessed with a modified version of the 9-item Strictness–Supervision scale (Steinberg, Lamborn, Dornbusch, & Darling, 1992). Our modified scale included four questions that asked students about what their parents attempt to know about their behaviors. These items were “How much do your parents try to know: (1) Where you go at night? (2) What you do with your free time? (3) Where you during the day? (4) About your drinking?” Response options for these items were as follows: 0 (*don’t try*), 1 (*try a little*), and 2 (*try a lot*). Coefficient alpha for this sample was $\alpha = .72$.

Parental Disapproval of Teen Alcohol Use. Parental disapproval of alcohol use was assessed with three items that had been previously modified from the Monitoring the Future Study (Johnston, O’Malley, & Bachman, 1996). Items assessed how participants thought their parents would feel if they (a) drank one or two drinks on one occasion, (b) drank three or four drinks on one occasion, (c) drank three or more drinks once or twice each weekend. Responses were measured on a 5-point scale ranging from 1 (*strongly disapprove*) to 3 (*strongly approve*). Coefficient alpha for this sample was $\alpha = .86$.

Parent-Teen Communication. Frequency of parent-teen alcohol-specific communication was assessed using a 9-item scale modified from a 16-item measure developed by Turrisi, Wiersma, and Hughes (2000). Participants indicated the frequency of discussions with their parents about a list of alcohol-related topics. Item examples included: “My parents and I have talked about how drinking could get me into trouble with the police,” “My parents and I have talked about how to find fun things to do instead of drinking,” “My parents and I have talked about drunk driving and it’s consequences.” Items were rated on a 4-point scale with response options ranging from 1 (*not at all*) to 4 (*a great deal*). Quality of parent-teen alcohol-specific communication was assessed using the same 9-item scale. Items were rated on a 5-point scale with response options ranging from 1 (*very negative*) to 5 (*very positive*). Coefficient alpha for these measures for this sample were $\alpha = .95$ and $\alpha = .96$, respectively.

The frequency of parent-teen general communication was assessed using a 4-item scale. Participants rated the frequency of discussion with their parents on a list of topics, including sports, clubs, school, and interpersonal relationships. Items were rated on a 6-point scale with response options ranging from 1 (*never*) to 6 (*daily*). The quality of parent-teen general communication was assessed using the same 4-item scale. Items were rated on a 5-point scale with response options ranging from 1 (*very negative*) to 5 (*very positive*). Coefficient alpha for these measures for this sample were $\alpha = .85$ and $\alpha = .87$, respectively.

Results

Descriptive Statistics

Means and standard deviations for parental influences and drinking behavior are presented in Table 1. A comparison of males and females indicated a significant difference between male ($M = 9.57$, $SD = 2.19$) and female ($M = 10.14$, $SD = 1.92$) perceived parental monitoring, $t(472) = 2.98$, $p < .01$, Cohen’s $d = -.28$, male ($M = 25.23$, $SD = 10.07$) and female ($M = 27.19$, $SD = 8.55$) quality of alcohol-specific communication, $t(472) = 2.29$, $p < .05$, Cohen’s $d = -.20$, and male ($M = 13.73$, $SD = 6.54$) and female ($M = 16.34$, $SD = 5.84$) frequency of general communication, $t(472) = 4.56$, $p < .001$, Cohen’s $d = -.42$. Bivariate correlations among predictor and criterion variables were calculated prior to conducting the main regression analyses (see Table 1).

Associations Among Parent Influences and Adolescent Drinking Behavior

Our first aim was to examine the relationship of parenting influences on adolescent drinking behavior. Specifically, we were interested in the unique effects of parental monitoring, parental disapproval of alcohol use, frequency and quality of parent-teen alcohol-specific communication, and frequency and quality of parent-teen general communication on heavy episodic drinking and alcohol-related consequences. Second, we aimed to test whether sex moderates the relationship between parental influences and adolescent drinking behavior, thereby identifying sex-specific relationships that may guide prevention and intervention programs.

To address these aims, two hierarchical regression analyses were conducted. Sex was dummy coded (males = 1). All other variables were mean centered to reduce problems of multicollinearity introduced into equations containing interaction terms (Aiken & West, 1991). Sex was entered on Step 1 of the model, the six parent variables were entered simultaneously on Step 2, and the six Sex x Parental Influence interaction terms were entered simultaneously on Step 3 to examine potential moderating effects of sex. Results of these analyses are presented in Table 2.

Heavy Episodic Drinking. In the first step of the regression analysis, there was no association observed between sex and heavy episodic drinking, $\Delta F(1,472) = 1.80, p = ns$. The addition of parental influences on Step 2 collectively accounted for a significant increase in the amount of variance explained in heavy episodic drinking, $\Delta F(6,466) = 2.84, p < .01$. The addition of the interaction terms on Step 3 collectively accounted a significant increase in the amount of variance explained in frequency of drinking, $\Delta F(6,460) = 2.72, p < .01$. As seen in Table 2, parental monitoring was a significant predictor of heavy episodic drinking. In addition, both the interaction terms for Sex x Monitoring and Sex x Disapproval were significant predictors of frequency of drinking.

To examine the nature of the interactions, tests of simple slopes were graphed and interpreted using Aiken and West's (1991) procedures. Figure 1 presents the significant two-way interactions between Sex x Monitoring and Sex x Disapproval where high and low values for monitoring and disapproval were specified as one standard deviation above and below the means. Examination of simple slopes indicated that among females, low parental monitoring was significantly associated with high levels of heavy episodic drinking ($\beta = -.23, p < .001$), whereas this relationship was not significant for males ($\beta = .02, ns$). In contrast, among males, parental disapproval of teen alcohol use was significantly associated with low levels of heavy episodic drinking ($\beta = .25, p < .001$), whereas this relationship was not significant for females ($\beta = -.02, ns$). Thus, parental monitoring was positively associated with heavy episodic drinking among females only, whereas parental disapproval of alcohol use was negatively associated with heavy episodic drinking for males only.

Alcohol Related-Consequences. In the first step of the regression analysis, there was no association observed between sex and alcohol-related consequences $\Delta F(1,472) = 3.22, p = ns$. The addition of parent variables on Step 2 collectively accounted for a significant increase in the amount of variance explained in alcohol-related consequences, $\Delta F(6,466) = 6.83, p < .001$. The addition of the interaction terms on Step 3 collectively accounted a significant increase in the amount of variance explained in frequency of drinking, $\Delta F(6,460) = 3.68, p < .001$. As seen in Table 2, parental monitoring, parental disapproval of teen alcohol use, and quality of parent-teen general communication were significant predictors of alcohol-related consequences. In addition, the interaction term for Sex x Monitoring was a significant predictor of alcohol-related consequences. Figure 2 presents the significant two-way interaction between Sex x Monitoring where high and low values for monitoring were specified as one standard deviation above and below the means. As seen in Figure 2, among females, low parental monitoring was significantly associated with high levels of alcohol-related consequences ($\beta = -.23, p < .001$), whereas this relationship was not significant for males ($\beta = .06, ns$). Thus, parental monitoring was positively associated with alcohol-related consequences among females only. Both parental disapproval of teen alcohol use and quality of parent-teen general communication were negatively associated with heavy episodic drinking for males and females.

Discussion

The present study tested the association between parental influences and adolescent drinking behaviors in a sample of 9th grade students. This study also examined sex as a moderator of these relationships. Our findings demonstrated significant associations between parental influences and both heavy episodic drinking and alcohol-related consequences. Additionally, sex moderated the relationship between parental influences and adolescent drinking behavior, thereby identifying sex-specific relationships between adolescent drinking behavior and parental monitoring and parental disapproval of teen drinking.

Results indicated parental monitoring was associated with lower levels of both heavy episodic drinking and alcohol-related consequences for females only. Findings are consistent with prior research indicating parental monitoring is related to lower levels of adolescent heavy episodic drinking (Guilamo-Ramos et al., 2004; Kim & Neff, 2010; Reifman et al., 1998) and alcohol-related consequences (Arata et al., 2003) and with the research identifying a stronger relationship between parental control for females than males (Choquet et al., 2008). Thus, the influence of parental monitoring may be an important protective factor for particularly for females. In contrast, results indicted parental disapproval of teen drinking was associated with lower levels of alcohol-related consequences for males and females. This finding is consistent with the literature indicating perceived parental disapproval of drinking is associated with lower levels of alcohol use and alcohol-related consequences (Arata et al., 2003; Foley et al., 2004; Mares et al., 2011). Additionally, parental disapproval of teen drinking was associated with lower levels of heavy episodic drinking for males only. Thus, parental disapproval of teen drinking may be an important protective factor particularly for males.

Findings also add to the mixed literature on association between parent-teen communication and adolescent drinking behavior. To our knowledge, this is the first study to examine the frequency and quality of both alcohol-specific parent-teen communication and general parent-teen communication within the same model. Results indicated that neither the frequency nor quality of parent-teen alcohol-specific communication was associated with adolescent drinking behavior for males or females. In contrast, the quality of parent-teen general communication was associated with alcohol-related consequences for both males and females. One explanation for this finding is that drinking behavior among adolescents in this age group may be more impacted by the overall quality of the parent-teen relationship, which may be reflected in the quality of parent-teen general communication, than by specific information about alcohol.

In contrast to prior research demonstrating a more robust relationship between parent-teen general communication for males relative to females (Guilamo-Ramos et al., 2004; Luk et al., 2010), results of this study suggest that parent-teen general communication may be a protective factors for females as well as males. Also in contrast to prior literature (Van Der Vorst et al., 2010), we did not find sex differences in alcohol-specific communication, rather, we did not find an associate between alcohol-specific communication and adolescent drinking behavior. Differences in sex-specific relationships between parent-teen communication and adolescent drinking behavior may be due to the communication measures used across these studies and the present study. For example, Luk et al. (2010) asked respondents how easy it is to talk to parents, Guilamo-Ramos et al. (2004) focused primarily on mother-child communication, and Van Der Vorst et al. (2010) measured the frequency of alcohol-specific communication. In this study, participants were asked to rate the quality of communication from “very negative” to “very positive”. Additionally, to our knowledge, this is the first study to examine the frequency and quality of both alcohol-specific and general communication within the same model. Thus, how communication is being measured and what types of communication are examined within a multivariate model may impact study results.

Limitations and Directions for Future Research

While this study contributes significantly to our understanding of the relationship between parental influences and drinking behavior among 9th grade students, certain limitations and interpretational cautions should be considered. First, the primarily Caucasian composition of the sample limits the generalizability of the results. Therefore, future research with more diverse samples is recommended to replicate the findings in this study. Additionally, parental influences and drinking variables were measured at the same time point, limiting the ability to make causal or temporal statements about the relationship of these variables. Future research using a prospective design would extend this study by allowing the examination of the relationships across time. Next, adolescents were asked about parent influences, rather than asking adolescents to report about mothers and fathers separately. As research indicates there are parent-specific influences, such as paternal vs maternal parent-teen communication on substance use (Luk et al., 2010), future research should examine not only sex-specific effects, but parent-specific effects and interactions between the two on adolescent drinking behaviors. Finally, information in this study was obtained through self-report. Although self-reported alcohol use is common practice in studies examining alcohol use among adolescents, future research should include parental reports of monitoring, disapproval of underage drinking, and quality of communication in addition to adolescent reports.

Clinical Implications

Results of this study provide directions for intervention efforts aimed at decreasing alcohol use and alcohol-related consequences for students as they transition into high school. First, results of this study add to the body of research indicating that parents continue to influence their children’s decisions to use alcohol during adolescence. Second, this study has sex-specific implications for parent-based intervention programs. Parental monitoring was a significant predictor of heavy episodic drinking and alcohol-related consequences for females only. Therefore, strategies promoting active parental knowledge of their teen’s whereabouts and activities may be best suited for programs for adolescent females. In contrast, parental disapproval of teen drinking was a significant predictor of both heavy episodic drinking and alcohol-related consequences for males, whereas for females, disapproval of teen drinking was predictive of alcohol-related consequences only. Results indicate educating parents on the importance of communicating attitudes that include disapproval of underage drinking may be particularly important for males. Results also indicated that working with parents on parent-teen general communication may be more beneficial than training parents in alcohol-specific communication during the transition to high school. Results also support sex-specific prevention and

intervention strategies. Specifically emphasizing the importance of monitoring teen activities, friends, and whereabouts may be particularly important in programs designed for females, whereas supporting parents to convey attitudes consistent with disapproval of teen drinking may be particularly important for males in this age group.

Conclusion

The aim of this study was to examine the relative importance of parental influences on adolescent heavy episodic drinking and alcohol-related consequences, as well as sex-specific relationships between parental influences and drinking behavior. We examined these relationships in a multivariate model, adding to the literature by examining frequency and quality of both alcohol-specific parent-teen communication and general parent-teen communication. The present study identified parental monitoring, parental disapproval of teen alcohol, and the quality of parent-teen general communication as predictors of drinking behavior. Sex moderated the relationship between parental monitoring and parental disapproval of use. Lower levels of parental monitoring were associated with higher levels of heavy episodic drinking and alcohol-related consequences for females only, whereas lower levels of parental disapproval of teen alcohol use was related to heavy episodic drinking for males only. Results support the importance of parental influences on adolescent drinking and the development of sex-specific prevention and intervention programs for adolescents in this age group.

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Table 1

Means, Standard Deviations, and Bivariate Correlations for Drinking Variables and Parental Variables

Measure	1	2	3	4	5	6	7	8
1. Heavy Episodic Drinking	—							
2. Alcohol Consequences	.30**	—						
3. Parental Monitoring	-.10*	-.09	—					
4. Parental Disapproval	.12**	.21**	-.14**	—				
5. Frequency of Alcohol Communication	-.06	.07	.22**	-.03	—			
6. Quality of Alcohol Communication	.02	-.07	-.14**	-.01	.26**	—		
7. Frequency of General Communication	-.09	-.10*	.28**	-.11*	.24**	.30**	—	
8. Quality of General Communication	-.10*	-.15**	.23**	-.11*	.14**	.33**	.68**	—
<i>M</i>	0.16	2.73	9.87	4.19	17.91	26.27	15.19	14.46
<i>SD</i>	0.67	6.24	2.07	2.18	8.36	9.34	6.24	4.71

Table 2

Summary of Hierarchical Regression Analysis for Parent Influences Predicting Alcohol Use and Alcohol-Related Consequences

Step	Predictor	Outcome Variable			
		Heavy Episodic Drinking		Alcohol-Related Consequences	
		ΔR^2	β	ΔR^2	β
1		.00		.01	
	Sex		-.04		-.08
2		.04**		.08***	

	Monitoring		-0.22**		-0.24***
	Disapproval		-0.01		.13*
	Frequency of Alcohol Communication		-0.08		.09
	Quality of Alcohol Communication		.08		-0.07
	Frequency of General Communication		-0.06		.00
	Quality of General Communication		-0.10		-0.21**
3		.03**		.04***	
	Sex X Monitoring		.20**		.24***
	Sex X Disapproval		.16*		.10
	Sex X Frequency Alcohol Communication		.05		.05
	Sex X Quality Alcohol Communication		-0.05		-0.02
	Sex X Frequency General Communication		.03		-0.03
	Sex X Quality General Communication		.08		.14

Note. All individual values for variables are from Step 3.

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

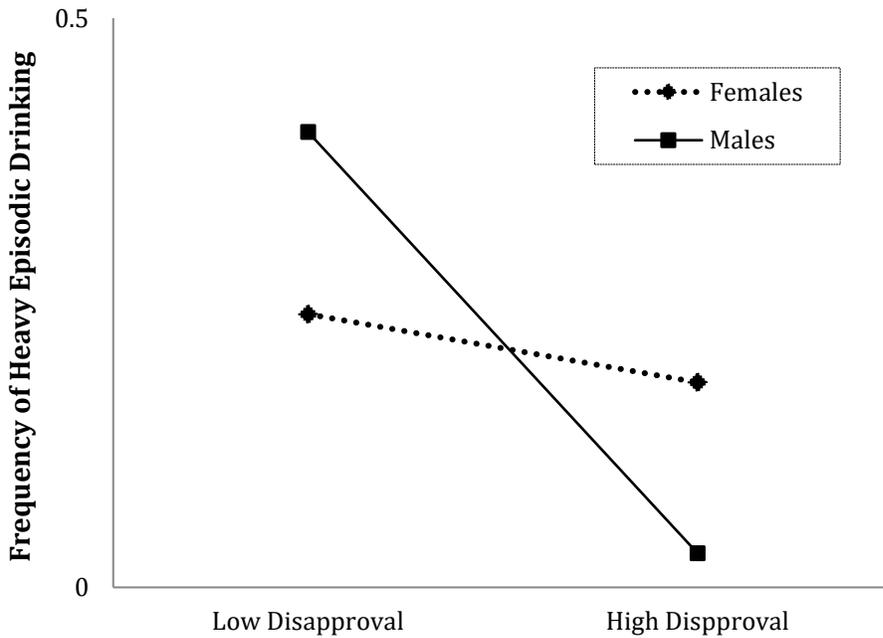
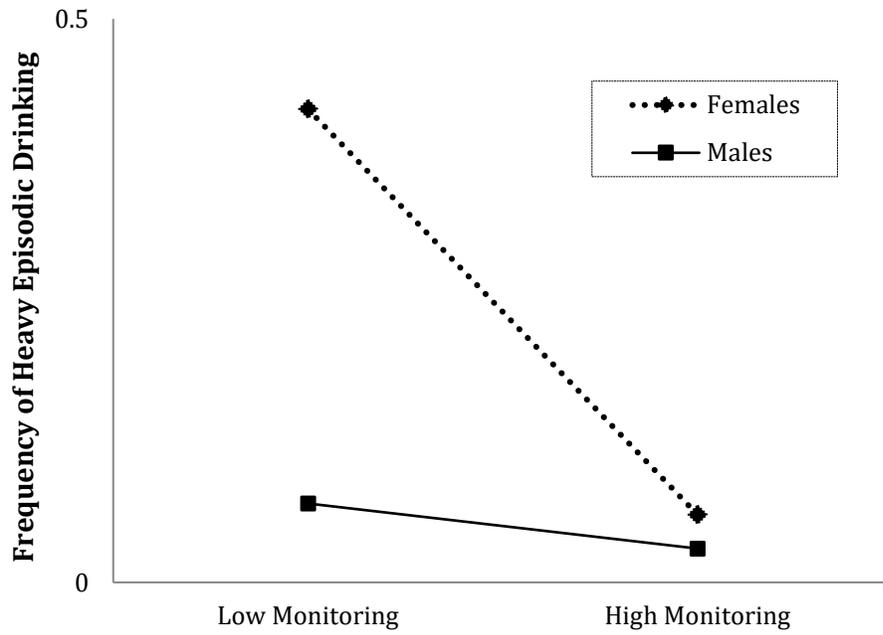


Figure 1. Two-way interactions involving gender and parental influences for frequency of heavy episodic drinking.

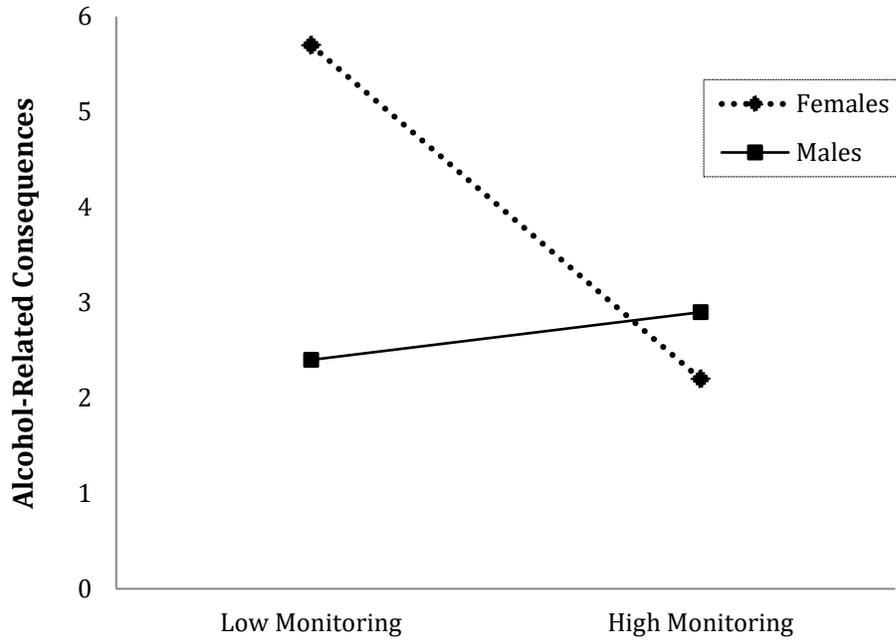


Figure 2. Two-way interaction involving gender and parental influences for alcohol-related consequences.