



Published in final edited form as:

*Dev Psychobiol.* 2010 April ; 52(3): 286–294. doi:10.1002/dev.20434.

## Sustained Parenting and College Drinking in First-Year Students

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### Abstract

Research indicates that for many students excessive drinking in college is a continuation of high school drinking tendencies. However, there have been limited theory-driven, systematic interventions targeting students so as to prevent alcohol misuse in their transition to college. Almost all current prevention approaches tend to be focused on younger populations and college-drinking interventions are typically delivered to students when they are already on campus. These analyses draw from a novel program of research involving parents of college freshmen based on the work of Turrisi et al. and focuses on examining: (1) the relationship between parenting and student drinking tendencies during the transitional period between high school and college and into the first year of college, and (2) the mediation process by which sustained parenting throughout the first year is related to college-drinking outcomes and consequences so as to inform future intervention efforts. The empirical evidence from this study suggests that sustained parental efforts have a beneficial effect on reducing high-risk drinking and preventing harm even at this late stage of late adolescent/early adult development.

### Keywords

drinking; college students; parenting

## INTRODUCTION

Heavy drinking among college students continues to be a public health concern for colleges and universities throughout the United States (Dawson, Grant, Stinson, & Chou, 2004; Johnston, O'Malley, Bachman, & Schulenberg, 2007; Perkins, 2002). Prevalence rates of heavy episodic drinking in college populations range from 40% to 50%, with nearly one of four students reporting extreme drinking tendencies including frequent heavy episodic drinking (3 times or more within a 2-week period), as well as drinking on 10 or more occasions within the past 30 days (Johnston et al., 2007; Wechsler et al., 2002). Students who engage in risky patterns of drinking are more likely to experience a range of consequences including academic impairment, blackouts, unplanned sexual activity, sexual and physical assaults, and personal injury (Abbey, 2002; Cooper, 2002; Hingson, Heeren, Winter, & Wechsler, 2005; O'Malley & Johnston, 2002). Researchers have identified numerous factors that influence drinking among the college population including peer influences, environmental influences, availability and accessibility of alcohol, and individual differences such as attitudes, expectancies, and personality. Although parents have long been thought of as an influence on drinking in younger populations, the predominant view in

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The authors would like to thank Mark Wood, University of Rhode Island, and Michael Ichiyama, University of San Diego, for their assistance on the research.

the early 1990s was that parental influence recedes among older teens (Hawkins et al., 1992). However, recent research has emerged suggesting parents can still be influential in college student drinking tendencies during the late stage of adolescence or emerging adulthood (Abar & Turrisi, 2008; Patock-Peckham & Morgan-Lopez, 2007; Reifman, Barnes, Dintcheff, Farrell, & Uhteg, 1998; Turner, Larimer, & Sarason, 2000; Turrisi, Wiersma, & Hughes, 2000).

For example, Turrisi, Jaccard, Taki, Dunnam, and Grimes (2001) published an initial study examining the efficacy of a parent-based intervention (PBI) in the form of a brief handbook that parents were asked to read and communicate with their teens just prior to them starting college. The outcomes of the randomized control trial focused on parental participation in the intervention, as well as students' drinking tendencies 3 months into the fall semester of their first year in college. With regards to parental involvement, results indicated that parents who received the PBI felt favorably about the materials and nearly all parents (97%) reported communicating to their students about the various topics. Students of parents who received the PBI reported consuming significantly fewer drinks over the course of a typical Thursday, Friday, and Saturday ( $p < .01$ ), reported being drunk fewer times ( $p < .01$ ), and experienced fewer alcohol-related consequences ( $p < .05$ ) compared with students whose parents did not receive the PBI. In addition to behavioral differences, students in the PBI condition were less likely to hold positive beliefs about drinking-related activities as well as perceived their peers to be less favorable toward these activities. Further, they reported lower perceptions of approval of alcohol use with respect to both their parents and friends. More recently, similar findings have been observed at 9 months post-intervention baseline (Turrisi, Abar, Mallett, & Jaccard, 2009). Mediation analyses have indicated that students of parents who received the PBI reported more favorable attitudes toward nondrinking alternatives on weekends, less positive drinking expectancies and norms, greater perceived negative affect associated with drinking, and more positive expectancies regarding healthy lifestyle orientations relative to no-treatment controls. These constructs were predictive of follow-up drinking tendencies and consequences.

As the initial evidence for the PBI was promising, the research was expanded in an attempt to both replicate the PBI efficacy findings in additional samples and examine intervention process and moderator variables. One such study (Turrisi et al., 2009) was designed to assess the efficacy of the PBI in combination with a peer-delivered BASICS intervention (Dimeff, Baer, Kivlahan, & Marlatt, 1999). The GOALS project was a 5-year, multisite, multimodality randomized control trial conducted with students who were identified as athletes in high school. High school athletes have been identified in the literature as being at higher risk for alcohol use and related problems (Dams-O'Connor, Martin, & Martens, 2007; Turrisi, Mallett, Mastroleo, & Larimer, 2006). Although the results of a 10-month follow-up assessment indicated that relative to controls, the combined intervention (PBI and BASICS) was efficacious in reducing peak blood alcohol content ( $p < .05$ ), drinks consumed per weekend ( $p < .05$ ), drinks consumed per week ( $p < .01$ ), and alcohol-related consequences at follow-up ( $p < .01$ ), the results for students whose parents received the PBI alone however, were not as efficacious as controls.

In a secondary moderator analysis of the GOALS project, latent profile analytic (LPA) methods were used to examine whether there were certain subtypes of parents, based on patterns of communication and behavioral practices, for whom the interventions were more effective in reducing students' high-risk drinking (Mallett et al., in press). The LPA analyses revealed parent subtypes that closely resembled well-established parenting styles: authoritative, permissive, authoritarian, and indifferent parents. When examining the relationship between the students in the control group from the different parent profiles, the authoritarian profile had significantly higher mean peak BACs when compared with the

other parent profile types. Further examination revealed that students in the treatment condition (combined PBI and BASICS) with authoritarian and permissive parent styles had significantly lower mean peak BACs compared with matched control participants. No differences were observed for the other parenting styles.

In addition to the aforescribed research by Turrisi and associates, two independent PBIs have been conducted. These two research studies adapted the PBI from Turrisi et al. (2001) and used nearly identical methods of recruitment, tracking, measures, and intervention materials. In the first study, a randomized controlled trial was implemented to increase alcohol-specific communication between mothers and daughters to reduce alcohol-involved sexual victimization (Testa, Hoffman, Livingston, & Turrisi, in press). This study was unique in that only female first-year college students were recruited. Path analysis revealed that the PBI increased mother–daughter communication prior to college matriculation and also during the fall semester, which was related to lower heavy episodic drinking (fall semester) and subsequent lower rates of alcohol-involved sexual victimization (spring semester). The second study was a 2-year randomized control trial examining the efficacy of a PBI delivered in a high-risk environment (Ichiyama et al., 2009). The location of the research site was within minutes of the United States-Tijuana, Mexico border where the legal drinking age is below 21 drawing underage students nightly to consume alcohol. The results of growth curve analyses showed that individuals in the PBI condition were less likely to shift from abstainers to drinkers relative to controls. In terms of students' weekly drinking patterns, results indicated females whose parents received the PBI showed less growth in weekly drinking through an 8-month follow-up assessment. Notably, the authors also reported that males in the PBI condition showed larger growth in typical weekly drinking relative to those in the control group.

The studies highlighted above seem to provide evidence for an efficacious PBI based on the work of Turrisi et al. (2001, 2009) with some evidence of replication in different populations (Testa et al., in press) and high-risk environments (Ichiyama et al., 2009). Although the body of literature that demonstrates the ability of parents to influence college student drinking behaviors continues to grow, there remains a lack of research examining the various aspects and effects of continued parenting during the transition period from high school through the first year of college. These studies provide insights on the means to strengthen the consistency of the effect of PBIs when implemented in different samples and different environments. Turrisi, Ray, and Abar (2008) showed that parental monitoring sustained from the summer prior to teens' first semester of college throughout the fall semester was associated with less favorable beliefs about alcohol held by teens, which in turn was associated with lower levels of drinking reported by teens during their fall semester of college. Although this study indicates sustained monitoring is an important variable to target in terms of parent-based interventions, more research is needed to determine what other parent variables, if sustained beyond the transition through students' first year of college, are critical in influencing drinking outcomes and related consequences. This was the focus of the study. Specifically, the theoretical model guiding the present analyses (Fig. 1) hypothesizes that sustained parental monitoring, communication credibility, and accessibility will be negatively related to high-risk drinking tendencies reported by students during the fall semester, such that higher levels of parental monitoring, expertise in communication, and accessibility as perceived by the teens will lead to less risky drinking tendencies. This reduction in risky drinking will, in turn, result in fewer alcohol-related problems reported during the spring semester, including sexual, physical, and academic consequences. Sustained perceived parental approval of high-risk drinking tendencies is hypothesized to be positively related to teens' reports of drinking tendencies in the fall. Thus, higher levels of parent approval of high-risk drinking tendencies as perceived by the teens will lead to higher risk drinking behaviors during the fall semester, which in turn will

lead to more alcohol-related harm experienced by students throughout their freshman year of college.

## METHODS

### Sample

The data are from a study conducted at a medium-sized, private, west coast university that examined the efficacy of the PBI in reducing college freshman alcohol use (see Ichiyama et al., 2009 for detailed methods). The sample for this study consisted of 446 freshmen randomized to the control group upon completion of a baseline assessment. Students were recruited from registrars' lists of incoming first-year students. The study rationale for examining control participants only was to examine the typical extent of sustained parenting on students' drinking outcomes in the absence of intervention efforts designed to increase and continue parent-teen communications. Students were administered web-based surveys prior to college matriculation (77% response rate) and again in the fall and spring semesters (84.0% and 78.2% retention rates from baseline, respectively). The demographic composition of the sample was as follows: 63.7% Female, 36.3% Male; 76.9% White/European, 11.2% Latino/other Spanish origin, 8.3% Asian/Pacific Islander, 1.1% Black/African American, 1.1% Middle Eastern/Arabic, 0.4% American Indian/Alaska Native, and .9% other; 50.4% Catholic, 30.3% Christian, 15.2% indicated no religious affiliation, 0.9% Buddhist, 0.7% Muslim, 0.9% Jewish, and 1.5% indicated other or chose not to answer. No differences on standard demographics were observed between participants and nonrespondents. Although participants were below the legal drinking age, 69.1% reported drinking at least once or more during their senior year of high school.

### Measures

**Drinking Tendencies**—The drinking tendencies of the participants were assessed at Time 2 and were measured using three indicators of alcohol consumption: peak drinking during the past month, number of times drunk during the past month, and a description of one's typical drinking behaviors. Specifically, peak drinking was assessed by asking the participants to "Think of the single occasion on which you drank the most over the past 30 days. How much did you drink?" Response options were: *0 drinks* (0), *1–2 drinks* (1), *3–4 drinks* (2), *5–6 drinks* (3), *7–8 drinks* (4), and *8 or more drinks* (5). To assess the number of times the participants were drunk within the past month students were asked: "During the past 30 days, how many times did you get drunk (not just a little high) after drinking alcohol?" Response options ranged from: *None* (0) to *15 or more times* (15). Finally, to measure participants' typical drinking tendencies, they were asked: "Since the beginning of the school term, how often do you have any drink containing alcohol, whether it is wine, beer, hard liquor, or any other alcoholic beverage?" Response options were on a 10-point scale and included: *I never drink alcohol* (0), *less than once a month* (1), *about once a month* (2), *2–3 drinks per month* (3), *1–2 drinks per week* (4), *3–4 drinks per week* (5), *nearly every day* (6), *about one drink per day* (7), *about two drinks per day* (8), and *about 3 or more drinks per day* (9). The coefficient of alpha for the three indicators of drinking tendencies was 0.85.

**Alcohol-Related Consequences**—Alcohol-related consequences were assessed at Time 3 using a brief version of the Young Adult Alcohol Problems Screening Test (YAAPST; Hurlbut & Sher, 1992). Items were included that represented problems common to the college-age population including physical, sexual, and academic consequences. Students were asked to indicate how often they experienced each consequence within the past 3 months (to be consistent with the time of the spring semester follow-up assessment) on a five-point scale ranging from *never* (0) to *10 or more times* (4). Three latent variables were

created to measure each of the three categories of consequences assessed. The latent variable measuring *sexual consequences* consisted of two indicators, including: “Have you gotten into sexual situations that you later regretted?” and “Have you ever had sex with someone you wouldn't ordinarily have sex with?” ( $\alpha = .64$ ). Three items were used to construct the latent variable for *physical consequences*, including: “Have you had a hangover the morning after you had been drinking?”, “Have you ever felt very sick to your stomach or thrown up after drinking?”, and “Have you awakened the morning after a good bit of drinking, and found that you could not remember a part of the evening before?” ( $\alpha = .72$ ). Finally, the latent variable measuring *academic consequences* consisted of two items, including: “Have you ever received a lower grade on an exam or paper than you should have?” and “Have you not gone to work or missed classes at school because of drinking, a hangover, or an illness caused by drinking?” ( $\alpha = .64$ ).

**Parental Monitoring**—Parental monitoring was measured with a latent variable with three indicators at both Times 1 ( $\alpha = .82$ ) and 2 ( $\alpha = .87$ ). The items representing each indicator asked teens to indicate how often their parents know where they are during the day, where they go at night, and what they do with their free time. Response options included: *they don't try* (0), *they try a little* (1), and *they try a lot* (2).

**Parental Expertise**—Parental expertise of communication was measured by a latent variable consisting of two indicators at both Times 1 ( $\alpha = .95$ ) and 2 ( $\alpha = .96$ ). The participants were asked to indicate their agreement with the items with respect to both parents (e.g., mom and dad) on a four-point scale ranging from *not at all* to *a great deal*. Specific items included: “The advice my mother/father gives me is helpful when we talk about important topics” and “When I need advice about something important I go to my mother/father for help.” To be consistent with the other parental variables that were measured at the level of parents as a whole as opposed to individually, the mother and father items assessing the same construct were summed to create the indicators for each item that reflected an overall score for both parents.

**Parental Accessibility**—To measure parental accessibility, a latent variable was constructed that consisted of two items at both Times 1 ( $\alpha = .90$ ) and 2 ( $\alpha = .94$ ). Teens were presented with two items and were asked to indicate their agreement with those items with respect to both parents. Specific items included: “My mother/father is too busy when I want to talk to her/him about things” and “My mother/father has trouble finding time to talk to me.” Similar to parental expertise, respondents were provided with a four-point scale ranging from *not at all* (0) to *a great deal* (3). Again, as other parental variables in the hypothesized model were measured at the level of parents as a whole, the individual scores for mother and father were summed to create an overall parent score for each indicator.

**Parental Approval**—Parental approval of high-risk drinking tendencies was assessed with a single item at both Times 1 and 2 that asked students to indicate “How would your parents feel if you drank one or two drinks nearly every day?” The respondents were given a five-point scale ranging from *very negative* (−2) to *very positive* (2).

## RESULTS

All analyses were conducted in AMOS 7.0 and results were organized into two sections. First, the hypothesized model was tested in the context of a one-group model including both male and female participants. Second, the model was tested in the context of a two-group solution to determine if there were differences between male and female teens. Goodness-of-fit of each model was determined by the chi-square test as well as other indices of practical



fit including CFI (Bentler, 1990) and RMSEA (Browne & Cudeck, 1993). The additional indices of fit were used as a result of the sensitivity of the chi-square test, such that with large samples similar to the current study ( $n = 446$ ), even trivial model differences are often statistically significant. Missing data techniques as described in Schafer and Graham (2002) were used for students who completed the baseline assessment but did not complete the fall follow-up, and for students who completed assessments but did not provide complete data for all measures.

### Theoretical Model

Results of the proposed theoretical model indicated good model fit. Specifically, although the chi-square was significant ( $\chi^2(284) = 564.863$ ), other indices of practical fit, CFI = .943 and RMSEA = .047, indicated a good fitting model. With respect to the parental variables of interest, perceived parental approval ( $b = .320, p < .001$ ), monitoring ( $b = .630, p < .001$ ), and accessibility ( $b = .540, p < .001$ ) during the summer prior to teens' matriculation to college were found to be significant predictors of perceived parental approval, monitoring, and accessibility assessed during the teens' fall semester of college. Perceived parental approval ( $b = .467, p < .01$ ), monitoring ( $b = -.470, p < .01$ ), and accessibility ( $b = -.147, p < .05$ ) assessed during fall semester were significantly associated with teens' high-risk drinking tendencies measured during the fall semester. In turn, high-risk drinking tendencies reported by teens were found to be significantly related to sexual ( $b = .035, p < .01$ ), physical ( $b = .309, p < .001$ ), and academic consequences ( $b = .053, p < .05$ ) experienced by teens as reported during the spring semester of their freshman year ( $b = .376, p < .001$ ). Although results showed perceived parental communication expertise during the summer to be a significant predictor of communication expertise during the fall semester ( $b = .169, p < .001$ ), this variable was not significantly related to teens' high-risk drinking tendencies.

### Two-Group Model

To determine if gender differences existed among the teens with respect to the hypothesized model, a two-group solution was examined. The first step was to test a baseline model in which all factor loadings and beta paths were allowed to vary in both groups to determine model fit when none of the paths were constrained to be equal. Results indicated similar fit statistics in comparison with the theoretical model that included both genders ( $\chi^2(568) = 937.509$ , CFI = .927, RMSEA = .038). To determine measurement invariance between both groups, the next step consisted of constraining all factor loadings to be equal across both groups and then comparing the fit indices with that of the previous model in which factor loadings were allowed to vary between groups. Comparison of the fit statistics for the model in which factor loadings were constrained to be equal across groups to the baseline model in which they varied across groups denoted a nonsignificant difference ( $\Delta\chi^2(14) = 22.381$ ;  $\Delta\text{CFI} = .002$ ;  $\Delta\text{RMSEA} = .000$ ), indicating identical factor structure across both males and females. Given the identical factor structure in both males and females, the model in which factor loadings were constrained to be equal across groups was used as the comparison model for the next step. The models were then compared with a model with beta paths that were free to vary between groups and then were constrained to be equal between groups, to determine whether significant differences were observed between males and females with respect to the beta weights for the hypothesized relationships. Results indicated no significant chi-square difference between males and females with respect to the beta paths for the parent constructs of interest. However, significant differences were observed regarding the relationship between fall drinking and spring consequences such that fall drinking significantly impacted sexual, physical, and academic consequences for females, but only significantly predicted physical consequences for males. See Figure 2 for the final model in which all factor loadings and beta paths were constrained to be equal except the paths from drinking during the fall semester to spring consequences.

## DISCUSSION

Previous reports that parental influence on drinking may be diminished as teens develop into adulthood may be misleading. The results from this study support the role of sustained parental behaviors into the college years and extend recent research by Turrisi et al. (2008). These results suggest that earlier parental efforts during high school that are continued when a teen arrives at college may be effective in reducing first-year college drinking. This has important implications for parents whose teens have not initiated into high-risk drinking patterns when in high school and may inaccurately perceive their teens to be “out of the woods.” Results indicate support for the hypotheses related to perceived parental approval, parental monitoring, and parental accessibility. Parenting practices perceived by teens as expressions of disapproval of high-risk drinking tendencies, higher levels of parental monitoring of behavior, and higher levels of perceived parental accessibility sustained from the summer prior to teens’ transition to college throughout the first semester of college were associated with fewer reports of high-risk drinking tendencies among these teens during the fall semester. This reduction in drinking was in turn associated with fewer reported consequences during the students’ first-year spring semester.

This study also revealed that, in terms of sustained parental influence, perceived parental communication expertise is not as critical to teens’ drinking behaviors as is perceived parental approval, monitoring, and accessibility. The lack of influence of this variable is inconsistent with research examining the influence of parental expertise and trust in risk behaviors among younger adolescents (Guilamo-Ramos, Jaccard, Turrisi, Johansson, & Bouris, 2006) but may make theoretical sense when examining parental influence on risk behaviors, namely alcohol use, among college students. As teens shift to college and are in the presence of peers as opposed to parents, the degree of expertise parents can hold with regard to important topics in their teens’ lives (e.g., going to a party on a Friday night) is limited as teens look to their peer group for advice. Although the college environment hinders parents’ ability to maintain communication credibility with respect to specific events in the lives of their teens as they are now living outside the home, parents can still communicate values such as disapproval of high-risk alcohol use, monitor their teens, and be accessible to teens through phone conversations, e-mail, and other forms of technology such as text messaging.

With regards to informing future parent-based prevention and intervention efforts, this research, in conjunction with previous work by Turrisi et al. (2008), argues for strategies that aim to increase parental involvement beyond the transition period as teens prepare to matriculate. Effective strategies may build from previous efficacious efforts (e.g., Turrisi et al., 2001) by encouraging parents to continue their communication with teens specific to alcohol use throughout the first year of college. In addition, intervention and prevention strategies that focus on increasing general parenting behaviors such as checking in with teens (monitoring), being available when teens want to communicate (accessibility), as well as communicating values about high-risk drinking (approval) may be more effective than strategies that focus on increasing communication expertise as parent credibility may be limited now that teens are living outside the home and increasingly turning to their peers for advice.

Although this study provides more insight into parental influences sustained beyond the transition to college throughout the first semester, many research questions in the domain of parent influence and related prevention/intervention strategies remain unanswered. Although future research will hopefully shed needed insight into the level, or dosage, of parental monitoring as well as the optimal dosage and timing of delivering PBIs, practical questions remain as college administrators are faced with the challenge of reducing alcohol use and

related harm and are interested in implementing PBIs on their campuses based on the empirical work to date (Ichiyama et al., 2009; Mallet et al., in press; Testa et al., in press; Turrisi et al., 2001, 2009; Turrisi, et al., 2009). One option is to resist requests to use the PBI because, as was highlighted earlier, more research is clearly needed on the impact of PBIs in diverse populations. The second choice is to allow officials to administer the PBI on their campuses while more research on enhancing PBIs is conducted. Finally, the third choice is to find a middle ground in which administrators could implement the PBI on their campus while agreeing to conduct an evaluation that could ultimately serve to build the body of evidence on PBIs. In our experience with this option, inherent in this agreement is a provision that they deliver the intervention while using a research design that would allow an evaluation of the intervention. In return, they are offered support including assistance with development of the research design, human subject applications, intervention implementation, and the evaluation process. Our own program of research has adopted the last option.

For example, we have examined an RTC at a large public university in the Midwest United States (Ray, Turrisi, & Bentley, 2006) and found at 6-month post-baseline follow-up significant mean differences between the treatment and control groups on the number of drinks consumed over the weekend and the number of times students reported getting drunk during the 30 days prior to the assessment. In addition to examining intervention effects, we also explored beliefs toward drinking as potential mediators of the relationship between the program effects and drinking outcomes. Results suggested that students exposed to the PBI held less favorable beliefs about the social and legal consequence of drinking which in turn led to a reduction in heavy drinking tendencies. A follow-up study was conducted to examine whether messages in the form of a letter accompanying the handbook could increase parents' motivation to engage in communication with their teens, and ultimately, reduce alcohol use (Turrisi & Ray, 2007). Parents were sent one of four letters along with the handbook. The letters had either a message that appealed to their perception of: (1) uniqueness as a parent who communicate with their teens about alcohol or (2) joining other parents who are talking with their college-bound teens about alcohol, and stressed either: the positive benefits of communicating to lower the possibility of alcohol-related consequences or the negative risks of not communicating to increase the possibility of alcohol-related consequences. Results indicated that students of the parents who were mailed a letter that appealed to parents' perceived uniqueness and stressed the positive benefits of communicating, reported significantly less positives beliefs toward alcohol use and had lower drinking tendencies.

These message-framing findings have been replicated in an independent study conducted at a small, private university in the southeast United States (Ainbinder et al., 2008). University administrators were interested in implementing the handbook to parents of all incoming freshmen, so the research examined differences in student drinking outcomes after administering parents a combination of the different message frames described above, relative to parents who received a control letter. Results mirrored the findings above, such that the students of parents who were mailed a letter that appealed to parents' perceived uniqueness and stressed the benefits of communicating, reported less positives beliefs toward alcohol use and had lower drinking tendencies. More recently Ainbinder, Bissett, Riedel, Turrisi, and Ray (2008) observed that students had lower drinking-related outcomes when their parents received a modified version of the letter emphasizing perceived uniqueness and stressing the positive benefits of parents communicating about their teens setting limits on drinks on a given occasion relative to the uniqueness-positive benefits letter alone.



In sum, the results of this study and the emerging literature on PBIs tend to support the positive influence of parents on reducing drinking and drinking-related problems in college students. Although more research is needed to understand the benefits of PBI and the limitations, it would be difficult to argue that parents are of little or no influence once their sons and daughters reach college age based on the research to date.

## Acknowledgments

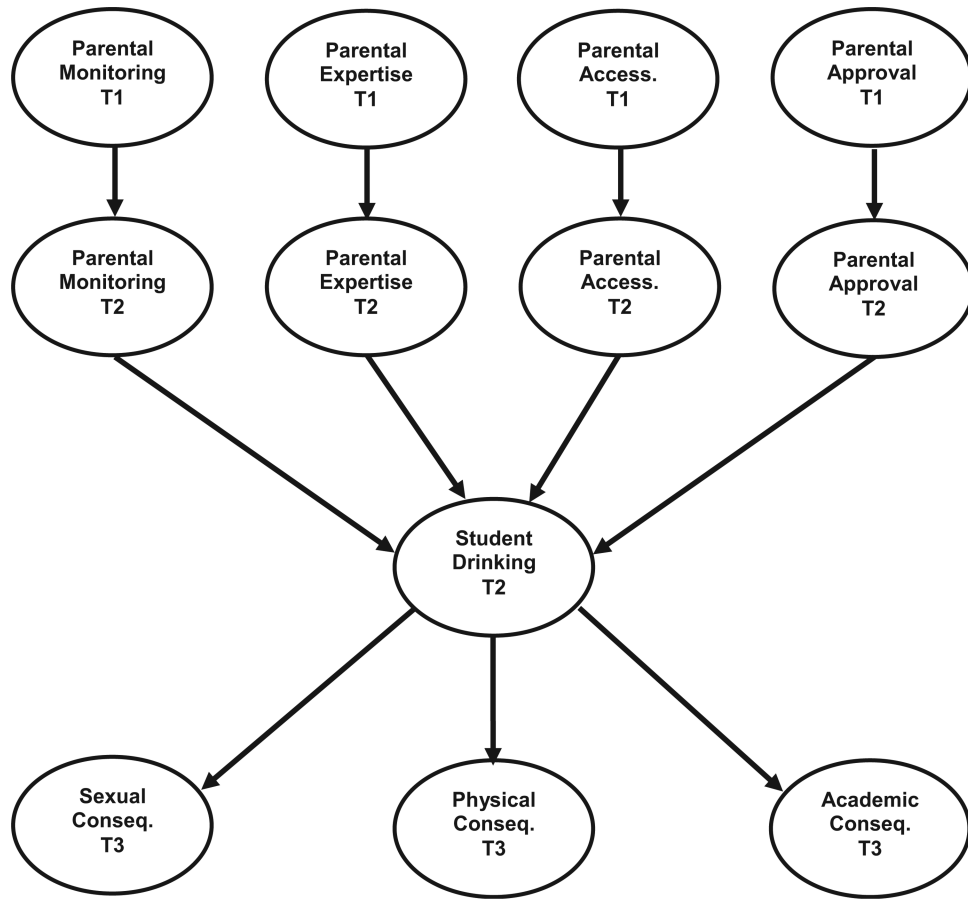
Contract grant sponsor: National Institute on Alcohol Abuse and Alcoholism

Contract grant numbers: R01 AA012529, R01 AA015737

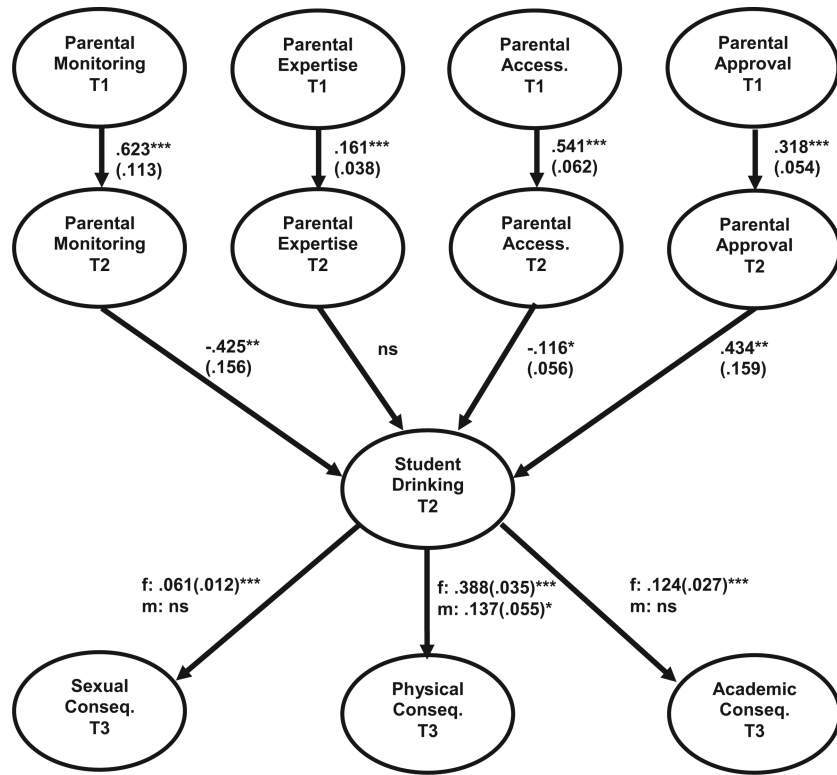
## REFERENCES

- Abar C, Turrisi R. How important are parents during the college years? A longitudinal perspective of *indirect* influences parents yield on their college teens' alcohol use. *Addictive Behaviors*. 2008; 33:1360–1368. [PubMed: 18635318]
- Abbey A. Alcohol-related sexual assault: A common problem among college students. *Journal of Studies on Alcohol*. 2002; (Suppl. 14):118–128.
- Ainbinder, D.; Bissett, D.; Riedel, R.; Turrisi, R.; Ray, A. Does stressing parental limits on alcohol consumption reduce binge drinking in college students?. Paper presented at the Annual Meeting of the Rocky Mountain Psychological Association; Boise, ID. 2008, April;
- Ainbinder, D.; Riedel, R.; Bissett, D.; Bendjebar, J.; Quesada, N.; Turrisi, R., et al. Research on parents' impact on college drinking behaviors.. Poster presented at the Annual Meeting of the International Counseling Psychology Association; Chicago, IL. 2008, March;
- Bentler PM. Comparative fit indexes in structural models. *Psychological Bulletin*. 1990; 107:238–246. [PubMed: 2320703]
- Browne, MW.; Cudeck, R. Alternative ways of assessing model fit.. In: Bollen, KA.; Long, JS., editors. *Testing structural equation models*. Sage; Newbury Park, CA: 1993. p. 136-162.
- Cooper ML. Alcohol use and risky sexual behavior among college students and youth: Evaluating the evidence. *Journal of Studies on Alcohol*. 2002; (Suppl. 14):101–117.
- Dams-O'Connor K, Martin JL, Martens MP. Social norms and alcohol consumption among intercollegiate athletes: The role of athlete and nonathlete reference groups. *Psychology of Addictive Behaviors*. 2007; 32:2657–2666.
- Dawson DA, Grant BF, Stinson FS, Chou PS. Another look at heavy episodic drinking and alcohol use disorders among college and noncollege youth. *Journal of Studies on Alcohol*. 2004; 65:477–488. [PubMed: 15378804]
- Dimeff, LA.; Baer, JS.; Kivlahan, DR.; Marlatt, GA. *Brief Alcohol Screening and Intervention for College Students (BASICS)*. The Guilford Press; New York, NY: 1999.
- Guilamo-Ramos V, Jaccard J, Turrisi R, Johansson M, Bouris A. Maternal perceptions of alcohol use by adolescents who drink alcohol. *Journal of Studies on Alcohol*. 2006; 67:730–737. [PubMed: 16847542]
- Hawkins JD, Catalano RF, Miller JY. Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse prevention. *Psychological Bulletin*. 1992; 112:64–105. [PubMed: 1529040]
- Hingson R, Heeren T, Winter M, Wechsler H. Magnitude of alcohol-related mortality and morbidity among U.S. college students aged 18–24: Changes from 1998 to 2001. *Annual Review of Public Health*. 2005; 26:259–279.
- Hurlbut SC, Sher KJ. Assessing alcohol problems in college students. *Journal of American College Health*. 1992; 41:49–58. [PubMed: 1460173]
- Ichiyama M, Fairlie AM, Wood MD, Turrisi R, Francis D, Ray A, et al. A randomized trial of a parent-based intervention with incoming college students. *Journal of Studies on Alcohol and Drugs*. 2009; (Suppl. 16):67–76. [PubMed: 19538914]

- Johnston, LD.; O'Malley, PM.; Bachman, JG.; Schulenberg, JE. Monitoring the future national survey results on drug use, 1975–2006: Volume II, College students and adults aged 19–45 (NIH Publication No. 07-6206). National Institute on Drug Abuse; Bethesda, MD: 2007.
- Mallet K, Turrisi R, Ray AE, Stapleton J, Mastroleo NR, Abar C, et al. Do parents know best? Examining parenting profiles and their impact on peak drinking and prevention efforts among college students. *Journal of Applied Social Psychology*. in press.
- O'Malley PM, Johnston LD. Epidemiology of alcohol and other drug use among American college students. *Journal of Studies on Alcohol Supplement*. 2002;23–39. [PubMed: 12022728]
- Patock-Peckham JA, Morgan-Lopez AA. College drinking behaviors: Mediational links between parenting styles, parental bonds, depression, and alcohol problems. *Psychology of Addictive Behaviors*. 2007; 21:297–306. [PubMed: 17874880]
- Perkins HW. Surveying the damage: A review of research on consequences of alcohol misuse in college populations. *Journal of Studies on Alcohol*. 2002; (Suppl. 14):91–100. [PubMed: 11925064]
- Ray, AE.; Turrisi, R.; Bentley, S. Examination of the efficacy of a parent-based intervention to reduce underage high-risk drinking on a high-risk campus.. Presented at the Annual Scientific Meeting of the Research Society on Alcoholism; Baltimore, MD. 2006, June;
- Reifman A, Barnes G, Dintcheff BA, Farrell MP, Uhteg L. Parental and peer influences on the onset of heavier drinking among adolescents. *Journal of Studies on Alcohol*. 1998; 59:311–317. [PubMed: 9598712]
- Schafer JL, Graham JW. Missing data: Our view of the state of the art. *Psychological Methods*. 2002; 7(2):147–177. [PubMed: 12090408]
- Testa M, Hoffman JH, Livingston JA, Turrisi R. Preventing college women's sexual victimization through parent based intervention: A randomized controlled trial. *Prevention Science*. in press.
- Turner AP, Larimer ME, Sarason IG. Family risk factors for alcohol-related consequences and poor adjustment in fraternity and sorority members: Exploring the role of parent–child conflict. *Journal of Studies on Alcohol*. 2000; 61:818–826. [PubMed: 11188487]
- Turrisi R, Abar C, Mallett K, Jaccard J. An examination of the mediational effects of cognitive and attitudinal factors on a parent intervention to reduce college drinking. *Journal of Applied Social Psychology*. 2009; 7:315–326.
- Turrisi R, Jaccard J, Taki R, Dunnam H, Grimes J. Examination of the short-term efficacy of a parent intervention to reduce college student drinking tendencies. *Psychology of Addictive Behaviors*. 2001; 15(4):366–372. [PubMed: 11767270]
- Turrisi R, Larimer M, Mallett KA, Kilmer J, Ray A, Mastroleo, Giesner I, et al. A randomized clinical trial evaluating a combined alcohol intervention for high-risk college students. *Journal of Studies on Alcohol and Drugs*. 2009; 70:555–567. [PubMed: 19515296]
- Turrisi R, Mallett KA, Mastroleo NR, Larimer ME. Heavy drinking in college students: Who is at risk and what is being done about it? *The Journal of General Psychology*. 2006; 133(4):401–420. [PubMed: 17128959]
- Turrisi, R.; Ray, AE. Evaluating parental involvement to reduce underage drinking on a high-risk campus.. Paper symposium presented at the Annual Meeting of the Society for Prevention Research; Washington, DC. 2007, May;
- Turrisi, R.; Ray, A.; Abar, C. When is parenting over? Examining parental monitoring and high-risk alcohol consumption in young adult college students.. In: Jaccard, J.; Dittus, P.; Guilamo-Ramos, V., editors. *Parental monitoring of adolescents*. Columbia University Press; New York, NY: 2008.
- Turrisi R, Wiersma KA, Hughes KK. Binge-drinking-related consequences in college students: Role of drinking beliefs and mother–teen communications. *Psychology of Addictive Behaviors*. 2000; 14:342–355. [PubMed: 11130153]
- Wechsler H, Lee JE, Kuo M, Seibring M, Nelson TF, Lee H. Trends in college binge drinking during a period of increased prevention efforts. *Journal of American College Health*. 2002; 50:203–217. [PubMed: 11990979]



**FIGURE 1.**  
Theoretical model of sustained parental influence.



Note: Females are denoted by f and males are by m.

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

**FIGURE 2.** Final two-group model of sustained parental influence with gender differences. *Note:* Females are denoted by “f” and males by “m.”