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Progressing from Light Experimentation to Heavy Episodic Drinking in Early and Middle Adolescence

Vincent Guilamo-Ramos, PH.D.[†], Rob Turrissi, PH.D.[†], James Jaccard, PH.D.[†], Elizabeth Wood[†], and Bernardo Gonzalez

School of Social Work, Columbia University, 622 West 113th Street, New York 10025

Abstract

Objective—Few studies have examined psychological variables related to changes in drinking patterns from light experimentation with alcohol to heavy episodic drinking in early and middle adolescence. The present study examined parental and peer influences, gender and grade level as predictors of such changes in adolescent alcohol consumption.

Method—Approximately 1,420 light drinkers were analyzed from Wave 1 of the National Longitudinal Study of Adolescent Health (Add Health). Heavy episodic drinking activity was assessed 1 year later.

Results—Gender differences in transitions to heavy episodic drinking were observed, with males being more likely than females to make a transition. Parent parameter setting and communication variables, as well as peer variables at different grade levels, buffered these gender differences.

Conclusions—Adolescents who are light experimenters represent a high-risk group as a consequence of their initial consumption tendencies. Some of these adolescents graduated beyond simple experimentation and moved into patterns of consumption that could be considered dangerous. Our analyses implicated an array of parental-based buffers: parent involvement in the adolescent's life, development of good communication patterns and expressions of warmth and affection. Minimizing associations with peers who consume alcohol may also have a buffering effect. There was evidence that these buffers may dampen gender differences not so much by affecting female drinking tendencies as by keeping males at reduced levels of alcohol consumption comparable to those of females.

Adolescent Alcohol Misuse is a major public health concern (Prendergast, 1994; Rachal et al., 1976). Reports suggest that 50% of adolescents have consumed alcohol by the eighth grade, with significant increases each year they are in high school (Johnston et al., 1999). Adolescents are also at a heightened risk for such drinking-related consequences as driving while intoxicated (Turrissi and Jaccard, 1992), suicidal orientations (Windle et al., 1992), alcohol dependence (Nelson et al., 1998), early sexual activity (Brown and Lourie, 2001), dropping out of school (Gomberg, 1997) and living away from parents prematurely (Krohn et al., 1997). Useful reviews of the implications of alcohol use in adolescence are provided by Windle (1999) and Monti et al. (2001).

Although research has documented important consequences of adolescent alcohol use, it suggests that not all adolescents drink heavily and that, when they consume alcohol, they do not necessarily drink the same amounts from one situation to the next (Farrington et al.,

[†]Correspondence should be sent to Vincent Guilamo-Ramos at the above address, or via rg650@columbia.edu. Rob Turrissi and Elizabeth Wood are with the Department of Psychology, Boise State University, Boise, ID. James Jaccard is with the School of Social Welfare and Department of Psychology, State University of New York, Albany, NY.

1996). On any given occasion, adolescents make consumption decisions based on numerous factors that include location, perceptions of risk likelihood, perceptions of the severity of consequences, attitudes about alternative activities, perceptions of their own drunkenness, peer approval, parental disapproval and parental monitoring (e.g., Dishion et al., 1995; Hawkins et al., 1992; Reifman et al., 1998; Turrise and Jaccard, 1992). These patterns may change over time, so identification of predictors of heavy episodic drinking at any single point in time may be of limited utility (Schulenberg et al., 2001). Although studies have focused on age of onset, heavy episodic consumption and trends over time (e.g., Bates and Labouvie, 1997; Schulenberg et al., 1996), few of them have examined variables that predict why some adolescents progress from light experimentation (drinking outside the home on several occasions, but always fewer than five drinks per occasion) to heavier episodic-type drinking (five or more drinks per occasion). This progression is the focus of the present research.

Using data from the National Longitudinal Study of Adolescent Health (Add Health)—a large, national, longitudinal survey of approximately 18,000 adolescents in Grades 7 through 12—we identified a population of adolescents who, as reported at a baseline assessment, had drunk alcohol outside their homes but had not engaged in heavy episodic drinking. One year later, these adolescents were reinterviewed, and data from these interviews were then used as a basis for identifying variables associated with the transition to heavy episodic drinking. The specific variables examined and their theoretical rationale are discussed in turn.

Parental influences

The developmental literature has established a relationship between parenting behaviors and adolescent drinking (Ary et al., 1993; Barnes and Welte, 1988; DiBlasio, 1986; Dielman, 1995; Hawkins et al., 1992; Kafka and London, 1991; McDermott, 1984; Reifman et al., 1998). This literature is juxtaposed with other studies that suggest there is a shift in the relative importance of parent versus peer influences during adolescence (Kandel and Andrews, 1987; Windle, 2000). Although peer dynamics are clearly relevant, intervention studies have shown that increased parental involvement in the lives of adolescents results in reduced adolescent alcohol consumption (e.g., Dishion et al., 2003), even as late as into the first year of college (Turrise et al., 2001). Despite the reports suggesting positive parental influence, we could not locate any published studies that examine the relevance of parent variables to adolescent transitions from light experimentation to heavy episodic drinking. We therefore examined three classes of parental influences.

The first class consists of behaviors that can be construed as parental parameter setting, such as setting curfews, requesting information about activities and encouraging independence and decision making (Jackson et al., 1999; Johnson and Johnson, 1999; Reifman et al., 1998). The effects of these variables in families may be due to an involved parenting style. Involved parents have more opportunities to intervene in unhealthy decision making by adolescents (Hartos and Power, 2000; Jackson et al., 1999; Johnson and Johnson, 1999; Reifman et al., 1998). We anticipate that parents who encourage independent decision making, but who set curfews, will have children who will be less likely to change from light to heavy drinking during adolescence. We anticipate that parents who do not encourage independent decision making and who do not set curfews will have children who will be more likely to change from light to heavy drinking during adolescence.

The second class of parent variables comprises communication practices. It has been shown that children who feel comfortable disclosing information about daily activities to their parents experience better adjustment (Hartos and Power, 2000; Kerr and Stattin, 2000; Kerr et al., 1999) and higher family cohesion (Barnes and Olson, 1985). Communication about activities allows parents to monitor their children accurately and create opportunities for decision-

making feedback. We predict that, where positive communications exist between parent and child, changes from light experimentation to heavy episodic drinking will be relatively low.

The final parent variable is parental warmth. Parents who provide a warm and loving environment for their adolescent should be less likely to see familial disengagement on the part of the adolescent (Dishion et al., 2000), which has been shown to be related to heavier drinking.

Peer influences

Theoretical models of social influence have stressed the role of peers in influencing a range of behaviors, and empirical evidence suggests that the social context of alcohol use is of particular importance for younger (Kandel and Andrews, 1987) as well as older (Carey, 1995) students. Such social factors as the drinking attitudes of peers and peer alcohol consumption are among the strongest correlates of adolescent alcohol use and abuse (Hawkins et al., 1992). According to Dishion et al. (2003), peer social reinforcement becomes a dominant force in an adolescent's life, and it is therefore a plausible assumption that adolescents will drink when they have peers who drink. Although such reports have been plentiful (e.g., Dishion et al., 1995; Kerr and Stattin, 2000; Patterson and Stouthammer-Loeber, 1984), this work has not examined adolescents who have already consumed alcohol but have not done so to a heavy episodic degree. Such individuals are at a critical point in their drinking trajectories where experimentation may or may not lead to heavier drinking. We anticipate that adolescents who have few peers who drink frequently have more "protective peers" than do those with many peers who drink frequently. Peer influence in their case should result in a lower probability of transitioning from light drinking to heavy episodic drinking.

Age and gender

Researchers have identified demographic characteristics, such as age and gender, as important predictors of adolescent drinking and alcohol-related consequences (Johnston et al., 1999; Schulenberg et al., 1996). Rose et al. (1999), for example, report that first experiences with alcohol outside the home generally occur by the time adolescents have reached the age of 16 or their sophomore year in high school. Findings from the Monitoring the Future study reveal that 39% of males and 24% of females among high school seniors can be categorized as heavy episodic drinkers (Johnston et al., 1996). Compared with females, males report drinking more often and in larger quantities, report higher levels of driving while intoxicated and report higher levels of fighting after drinking (Johnston et al., 1996; Prendergast, 1994). We therefore anticipate that changes from light experimentation to heavy episodic drinking will be less common in females and younger adolescents than in males and older adolescents.

In sum, our analysis of adolescents who progress from light experimentation to heavy episodic drinking considers parental parameter setting tendencies, parental communication, warmth, peer drinking behavior, gender and age as predictors. We hypothesize that these variables will have interactive influences that have not been fully explored in other analyses of transitions from light experimentation to heavy episodic drinking. We expect gender and age will influence transitions from light to heavy drinking (males more likely to progress than females and older adolescents more likely than younger ones), but that the influence of these demographic factors will be attenuated when positive parent influence is lower and negative peer influence is higher.

Method

Overview

The present study used a prospective design to examine why some adolescents progress from light experimentation (drinking outside the home on several occasions, but always fewer than

five drinks per occasion) to heavier episodic-type drinking (five or more drinks per occasion). In Year 1, adolescents in grades 7–11 were screened to isolate a sample of light experimental drinkers. In Year 2, the relationship between parent, peer and demographic variables (age, gender) and heavy episodic drinking was examined for those adolescents.

Respondents

The study sample consisted of 1,420 unmarried adolescents from the Add Health data set who met the criteria for light experimentation with alcohol measured at the baseline assessment period and who were reinterviewed as part of the Add Health study 12 months later. We used the public-use data set made available by Add Health. Our analyses are restricted to adolescents who (1) were unmarried, (2) engaged in experimental drinking at Wave 1 and (3) were reinterviewed at Wave 2 (those in grade 12 at Wave 1 were not reinterviewed in Add Health because it was too costly to find those respondents, most of whom had moved out of their parents' homes; some of the special samples of Add Health were also not re-interviewed for cost reasons). Table 1 presents a demographic profile of these adolescents. The Add Health data set is based on the administration of surveys to approximately 18,000 adolescents from a stratified random sample of middle schools and high schools in the United States (for details, see Bearman et al., 1997). A detailed description of the study and its design can be found at the Add Health website at www.cpc.unc.edu/addhealth.

Procedure

Students participated in the Year 1 interviews between April and December 1995. Year 2 interviews were completed between April and December 1996. Each interview covered diverse health areas and lasted 1–2 hours depending on respondent age and experience. Respondents listened through earphones to prerecorded questions on laptop computers and either entered answers directly into the computer (audio-CASI) or had the answers entered by an interviewer. Interviews were also conducted with a parent of the adolescent, typically the mother. Interviewers were trained professionals employed by the National Opinion Research Corporation, the company responsible for data collection.

Measures

Heavy episodic alcohol consumption—The primary drinking outcome was frequent heavy episodic consumption in Year 2. This was assessed with the following question: Over the past 12 months, on how many days did you drink five or more drinks in a row? Answers were on a 7-point scale (0 = never, 1 = 1 or 2 days in the past 12 months, 2 = once a month or less 3 to 12 times in the past year, 3 = 2 or 3 days a month, 4 = 1 or 2 days a week, 5 = 3 to 5 days a week, 6 = every day or almost every day).

General strategy for measuring parental variables—Assessments of parental influences were based on reports from the adolescents. The rationale was that the adolescents' perceptions of their parents' behavior, as opposed to the actual parent behavior, is what has more influence on adolescent behavior (Jaccard et al., 1998; Turrissi et al., 1994).

Parental parameter setting—Three items were used to assess parameter-setting tendencies. The first item was worded as follows, "Do your parents let you make your own decisions about the time you must be home on week-end nights?" Individuals responded on a yes/no scale. The second and third items were statements to which individuals indicated their agreement/disagreement on a 5-point Likert-type scale. They were, "My mom usually knows what is going on in my life" and "My mom encourages me to be independent."

Parental communication practices—Three items were used to assess the quality of parent-adolescent communication. First, adolescents were asked to indicate whether they had a serious argument about their behavior in the past 4 weeks (yes/no). Second, adolescents were asked to indicate whether they had talked with their resident mother in the past 4 weeks about a problem they were having (yes/no). Third, adolescents were asked to indicate their satisfaction with the communication with their mothers using the 5-point Likert-type scale (I am satisfied with the way my mom and I communicate with each other).

Parental warmth—To assess parental warmth, adolescents were asked to indicate their agreement/disagreement on the 5-point Likert-type scale to the following item, “Most of the time my mom is warm and loving toward me.”

Peer assessment—To assess peer influences, adolescents were asked, “Of your 3 best friends, how many drink alcohol at least once a month?” Adolescents could indicate a range of 0 to 3 friends who drank at least once a month.

Analytic strategy—The analyses used multiple regression-based methods. Add Health employed a stratified random sampling design in which schools were sampled from the Quality of Education Database. Student level sampling weights were calculated for both waves of the design (Tourangeau and Shin, 1998). Because the use of sampling weights in complex model evaluation is controversial (e.g., Lohr and Liu, 1994; Winship and Radbill, 1994), we conducted both weighted and unweighted analyses and report the former. No discrepancies in conclusions across the two forms of analysis resulted. The weighted analyses used SUDAAN and the robust estimation strategy developed by Binder (1983) as an extension of Generalized Estimating Equations (GEE) strategy (Liang and Zeger, 1986). Controls for multiple contrasts used the Holm modified Bonferroni method (Jaccard, 1998).

Results

We regressed heavy episodic drinking at Year 2 onto gender, grade (dummy coded), parental warmth, peer drinking and parental parameter setting or parent communication variables and their product terms using the logic described in Jaccard and Turrise (2003; see also Jaccard et al., 1990). With respect to main effects for grade and gender, a significant difference was observed in transitions to heavy drinking as a function of gender, with males indicating more transitions to heavy episodic drinking than females indicated (2.43 versus 1.86, $p < .001$). There was no significant effect of grade, nor was there a statistically significant grade by gender interaction. There were five note-worthy and complex interactions involving gender, grade and one or more of the parent and peer variables. These effects remained significant when ethnicity was included as a covariate in the models. We discuss each of the effects, in turn.

Gender, grade, curfew setting and arguments with parents

There was a statistically significant ($p < .001$) four-way interaction between gender, grade, curfew setting and whether the adolescent had recently had an argument with his or her mother. The major source of this interaction was that the three-way interaction between gender, curfew setting and arguments with parents for seventh graders at Year 1 differed substantially from the same three-way interaction for all other grade levels. Table 2 presents the three-way interaction for seventh graders (note: the means are their eighth-grade drinking levels). It can be seen that when communication was positive (as reflected by the absence of arguments), there were trivial gender differences and trivial effects of curfew setting. However, when communication was negative (as reflected by the presence of arguments), there was a significant gender difference in transitions to heavy episodic drinking. The nature of the gender difference was dependent on the presence of a curfew. When there was no curfew, females

were more likely than males to progress to heavy episodic drinking. This gender difference was in the opposite direction in the presence of a curfew. For the other grade levels, none of these qualifying dynamics were evident.

Gender, grade and communication satisfaction

There was a statistically significant ($p < .001$) three-way interaction between gender, grade and communication satisfaction. The major source of this interaction was a differential two-way interaction between gender and satisfaction for seventh graders as opposed to the other grade groups. Predicted means for seventh graders at three levels (high, medium and low) of communication satisfaction were males: 1.36, 2.11 and 2.87* ($*p < .05$), respectively; females: 1.44, 1.47 and 1.50, respectively (where “low” is one standard deviation below the satisfaction mean, “medium” is at the satisfaction mean, and “high” is one standard deviation above the satisfaction mean; the means are their eighth-grade drinking levels). When communication satisfaction is high, there is a trivial gender difference in heavy episodic drinking tendencies. As communication satisfaction decreases, however, gender differences emerge, with males tending to engage in higher levels of heavy episodic drinking than females do. These qualifying effects of communication satisfaction on gender differences were not evident at the other grade levels.

Gender, grade and peers

There was a statistically significant ($p < .001$) three-way interaction between gender, grade and the number of alcohol-using close friends the respondent reported having. The major source of this interaction was a differential two-way interaction between gender and number of peers for seventh graders as opposed to the other grade groups. Predicted means for seventh graders who reported differing numbers (0, 1, 2 and 3) of alcohol-consuming friends were males: 1.05, 1.02, 2.14 and 3.57* ($*p < .05$), respectively; females: 1.06, 1.49, 2.24 and 2.13, respectively. The gender differences were strongest when the number of alcohol-using friends was at its maximum, with males reporting higher levels of drinking than females did. These qualifying effects were not evident at the other grade levels.

Gender, grade and warmth

There was a statistically significant ($p < .001$) three-way interaction between gender, grade and maternal warmth. The major source of this interaction was a differential two-way interaction between gender and warmth for tenth graders, as opposed to the other grade groups. Predicted means for tenth graders at three levels (high, medium and low) of maternal warmth were males: 1.29, 1.85* and 2.41* ($*p < .05$), respectively; females: 1.58, 1.48 and 1.38, respectively (where “low” is one standard deviation below the warmth mean, “medium” is at the warmth mean, and “high” is one standard deviation above the warmth mean; the means are their eleventh-grade drinking levels). When maternal warmth is high, there is a trivial gender difference in heavy episodic drinking tendencies. As maternal warmth decreases, however, gender differences emerge, with males tending to engage in higher levels of heavy episodic drinking than females do. These qualifying effects of maternal warmth on gender differences were not evident at the other grade levels.

Gender, grade and maternal involvement

There was a statistically significant ($p < .001$) three-way interaction between gender, grade and reports of the extent to which the adolescent thinks the mother knows what is going on in the adolescent's life. The major source of this interaction was a differential two-way interaction between gender and maternal involvement for tenth graders, as opposed to the other grade groups. Predicted means for tenth graders at three levels (high, medium and low) of maternal involvement were males: 1.16, 1.71 and 2.26* ($*p < .05$), respectively; females: 1.45, 1.48 and

1.51, respectively (where “low” is one standard deviation below the involvement mean, “medium” is at the involvement mean, and “high” is one standard deviation above the involvement mean; the means are their eleventh-grade drinking levels). It can be seen that when maternal involvement is high, there is a trivial gender difference in heavy episodic drinking tendencies. As maternal involvement decreases, however, gender differences emerge, with males tending to engage in higher levels of heavy episodic drinking than females do. These qualifying effects of maternal involvement on gender differences were not evident at the other grade levels.

Discussion

Although the developmental literature clearly has emphasized the importance of examining adolescent drinking trajectories (e.g., Schulenberg et al., 1996), few systematic investigations have identified variables that predict change in adolescent drinking patterns once drinking has begun. Adolescents who graduate beyond light experimentation represent an especially high-risk group. Our study focused on a sample of adolescents who had experimented with alcohol but who had not engaged in heavy episodic consumption at Year 1. At Year 2, some of these adolescents progressed to heavy episodic drinking, and the goal of our research was to identify factors associated with that transition.

In our study, we observed trends towards a gender difference in all age groups, with males tending to be more likely than females to transition to heavy episodic drinking. It is interesting that we did not observe significant overall grade effects. Although our findings with respect to gender are consistent with previous large-scale studies (Johnston et al., 1999; Schulenberg et al., 1996; Windle, 1996), they appear to be at odds with those that have found age to be a significant predictor of drinking (e.g., Barnes and Welte, 1988; Johnston et al., 1999; Rose et al., 1999). Our findings can be reconciled with past research because we focused on the drinking tendencies of individuals who were already identified as light experimental drinkers, which is a more specialized subgroup of adolescents. These are adolescents who have already crossed the barrier of alcohol abstinence and are experimenting with alcohol, albeit on a “light” basis. Once an adolescent has made such a transition, our analyses suggest that the risk of heavy episodic drinking tends to be similar, no matter what the adolescent’s current grade level.

Our analyses implicate an array of buffers, including parent parameter setting, good communication patterns, expressions of warmth and affection and the minimizing of associations with peers who consume alcohol. Our reports are consistent with those of Dishion et al. (2003) and of others (Kerr and Stattin, 2000; Patterson and Dishion, 1985; Patterson et al., 1990) who contend that lack of adult involvement enhances the potential for adolescents to adopt peer values that may support heavy drinking.

Our observations with respect to communication, gender and age seem to warrant further attention. Among seventh graders, we detected a trivial gender difference in transitions to heavy episodic drinking tendencies when communication satisfaction was high. As communication satisfaction decreased, however, gender differences emerged, with males reporting a tendency to engage in higher levels of heavy episodic drinking than did females. These qualifying effects of communication satisfaction on gender differences were not evident at the other grade levels. Our findings suggest that seventh grade may be a critical developmental period in the male adolescents’ lives in which communication can have a major impact. Dishion et al. (1995) and Stoolmiller (1994) have reported that parents of high-risk adolescents show a tendency to “give up” on monitoring, behavioral management (curfews) and positive communication practices. Our results are consistent with the view that such familial disengagement could have a significant impact on those males who are light experimental drinkers.

Some of the effects in our analyses seem counterintuitive in relation to past research. It is important to bear in mind that the individuals in our study are ones who are already drinking. For example, Table 1 notes that enforcement of curfews for seventh graders led to more drinking in males who had been arguing with their parents. These data suggest that enforcing a curfew may be more of a reactive parenting technique to extant risk behavior than a proactive parenting technique to prevent risk behavior. Granic et al. (2003) reported that the relationship between parents and adolescents is dynamic and constantly readjusting on the basis of changes that occur during adolescence. Imposing a curfew thus might be in response to a mistrusted adolescent who has been caught drinking or parental perceptions of heavy drinking that may be occurring in their adolescent's environment.

The results reported here must, of course, be interpreted in light of study limitations. The heavy episodic drinking indices relied on self reports and may be subject to some degree of measurement error. As noted, Add Health study respondents were not required to report their alcohol-related behavior directly to an interviewer. These questions were self-administered using audio-CASI technology, and respondents were assured of confidentiality. These conditions increase our confidence in the validity of the measures, but caution is still required. Our results are correlational and therefore do not permit unambiguous causal attributions. Despite these caveats, we believe the present research provides important insights to help better understand the process by which adolescents progress from light to heavy episodic drinking. Our results underscore the importance of parental-based buffers, including parent involvement in the adolescent's life, good communication patterns, expressions of warmth and affection, and the minimizing of associations with peers who consume alcohol.

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TABLE 1

Descriptive statistics for sample based on weighted analyses

Ethnicity	
European American	54%
African American	22%
Latino	14%
Asian	7%
Other	3%
Grade	
7th	9%
8th	14%
9th	22%
10th	28%
11th	27%
Religion	
Catholic	28%
Protestant	54%
Jewish	1%
Other	4%
None	13%
Welfare status	
Parent is a welfare recipient	8%
Maternal education	
Less than high school	12%
High school graduate	38%
Some college	22%
College graduate	28%
Mean frequency heavy episodic drinking *	
Male	2.43
Female	1.86

* Males statistically significantly different from females ($p < .05$). Total $N = 1,420$.

TABLE 2

Effects of gender, curfew setting and communication on transitions to heavy episodic drinking for 7th graders

	Argued with parent in past week		Not argued with parent in past week	
	Curfew	No curfew	Curfew	No curfew
Male	3.35*	1.05*	1.70	1.92
Female	1.18	1.51	1.41	1.53

* Gender difference is statistically significant, $p < .05$.