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Differential trajectories of alcohol-related behaviors across the first year of college by parenting profiles

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Abstract

This study examined the extent to which profiles of perceived parenting are associated with trajectories of alcohol-related behaviors across the first year of college.

Method—Participants were surveyed five times from the summer prior to college to the fall of the second year. A total 285 college students were enrolled from the incoming classes of consecutive cohorts of students at a large, public university in the Northeastern U.S. At baseline, participants provided information on their parents' alcohol-related behaviors (e.g., parental modeling of use; perceived approval of underage use) and parenting characteristics (e.g., parental monitoring; parent-child relationship quality). Students also reported on their personal alcohol-related behaviors at each time point.

Results—Latent profile analysis was used to identify four subgroups based on the set of parenting characteristics: *High Quality* (14%) – highest parent-teen relationship quality; *High Monitoring* (31%) – highest parental monitoring and knowledge; *Low Involvement* (30%) – poor relationship quality, little monitoring and communication; and *Pro-Alcohol* (21%) – highest parental modeling and approval. Students were then assigned to profiles, and their alcohol-related behaviors were examined longitudinally using latent growth curve modeling. In general, students in the *Pro-Alcohol* profile displayed the highest baseline levels of typical weekend drinking, heavy episodic drinking, and peak BAC, in addition to showing steeper increases in typical weekend drinking across the first year of college.

Discussion—Results support the notion that parental behaviors remain relevant across the first year of college. Differential alcohol-related behaviors across parenting profiles highlight the potential for tailored college intervention.

Keywords

Parents; College Students; Alcohol; Latent Profile Analysis

Alcohol consumption during the college years represents one of the most salient public health concerns on U.S. campuses today (Blanco et al., 2008; Hingson et al., 2009), with rates of alcohol misuse tending to reach lifetime peaks during this developmental window (Dawson, Grant, Stinson, & Chou, 2004). The transition to college and the freshman year represent a particularly risky period, as a recent study in USA Today found that first-year students disproportionately accounted for greater than 1/3 of alcohol-related deaths in college despite representing approximately 1/4 of students (Davis & DeBarros, 2006). The National Institute on Alcohol Abuse and Alcoholism's 2002 report on college alcohol use called for epidemiological research on antecedents of student use and intervention efforts at preventing mortality and morbidity associated with this use. In response, a host of research scientists and college administrators have examined various ways in which the onset and escalation of alcohol use can be delayed or prevented. The majority of this work has focused on the roles of peers (e.g., Abar & Maggs, 2010; Marshall & Chassin, 2000; Nash, McQueen, & Bray, 2005; Park, Sher, & Krull, 2009), the university (e.g., Knight et al., 2002), and the community at large (e.g., Nelson, Naimi, Brewer, & Wechsler, 2005; Weitzman, Nelson, & Wechsler, 2003) in fostering safe and responsible alcohol-related behaviors. A growing minority of work has also begun to look at the potential influence of parents during the college years, with results indicating that they continue to play a role in development throughout emerging adulthood (e.g., American College Health Association NCHA, 2003; Fairlie, Wood, & Laird, 2012; Galambos, Barker, & Almeida, 2003; Patock-Peckham & Morgan Lopez, 2007; Walls, Fairlie, & Wood, 2009).

Research in this area has shown a variety of parenting characteristics to be predictive of college frequency and quantity of alcohol use, frequency of heavy episodic drinking, peak level of alcohol consumption, and negative consequences of alcohol consumption. These characteristics include, but are not limited to: modeling of alcohol-related behaviors (Boyle & Boekeloo, 2006; White, Johnson, & Buyske, 2000), approval or permissibility of underage alcohol use (Abar, Abar, & Turrissi, 2009; Nash et al., 2005), open communication between parents and teens (Turrissi, Wiersma, & Hughes, 2000), parental monitoring and knowledge (Abar & Turrissi, 2008; Padilla-Walker, Nelson, Madsen, & Barry, 2008), and parent-teen relationship quality (Barnes, Reifman, Farrell, & Dintcheff, 2000). Taken singularly, these findings have highlighted a number of potential targets for intervention at the college level.

To date, several randomized preventive trials have been performed examining the utility of parent-based approaches to limiting college alcohol misuse with varying levels of success (e.g., Ichiyama et al., 2009; Turrissi, Jaccard, Taki, Dunham, & Grimes, 2001; Turrissi et al., 2009; Wood et al., 2010). A potential reason for the lack of consistent findings and strong effect sizes is that parental influences are not easily distilled down to a single or small number of variables on which to intervene. Parenting adolescents and emerging adults is a complicated process that involves awareness of one's own activities, as well as active parenting behaviors and the affective connection between parents and teens. This supposition is in line with the frequently-cited contextual model of parenting presented by Darling and Steinberg (1993). In this model, parenting practices and parenting style are delineated, with parenting practices describing behaviors with a defined socialization goal and parenting style describing a pattern of attitudes, communications, and emotional climate

encapsulating the parent-child relationship. In general, parenting style is derived from the Baumrind (1971) and Maccoby & Martin (1983) conceptualization, defined by levels of parental warmth/responsiveness and behavioral control/limit setting. However, given the increased autonomy provided (Beck, Taylor, & Robbins, 2003) and diversified contexts to which emerging adults are exposed (Schulenberg et al., 2000), a broader and more complex approach may be necessary when examining parenting of college students. The contextual model of parenting (Darling & Steinberg, 1993) postulates that parenting practices (e.g., monitoring and knowledge, permissibility, modeling of alcohol use) have a direct effect on child outcomes, while parenting styles (e.g., parent-child relationship quality, communication) moderate the impact of parenting practices on outcomes. Analytic methods capable of both expanding upon the Maccoby & Martin (1983) four-group conceptualization of parenting and accounting for the model complexity implied by Darling & Steinberg (1993) have the potential to enhance our understanding of the most effective method for parent-based intervention.

Little research has examined how the multiple parental practices and facets of style discussed above are associated in the context of emerging adult alcohol use and the extent to which they can be analytically reduced to sub-types of parents. A recent study by Abar (2012) examined the perceived parenting characteristics of a large sample of incoming college freshman enrolled in a parent-based intervention to reduce the onset and escalation of alcohol use in college. Using latent profile analysis, this study found four perceived parenting sub-types just prior to college enrollment: the *High Quality* profile (19%; reported the highest parent-teen relationship quality), the *High Monitoring* profile (31%; reported the highest levels of parental monitoring and knowledge of how students spent their free time); the *Anti-Alcohol* profile (30%; reported the lowest levels of parental alcohol modeling and parental approval of underage drinking, in addition to the poorest parent-teen relationship quality), and the *Pro-Alcohol* profile (21%; reported the highest levels of parental modeling and parental approval of alcohol use). These profiles were then cross-sectionally associated with types of student alcohol-related risk, with the *Pro-Alcohol* profile associated with the most risky teen alcohol-related behaviors and cognitions. Follow-up work has linked similar parenting profiles with subgroups of college students experiencing excessive alcohol-related consequences (Varvil-Weld, Mallett, Turrissi, & Abar, 2012).

The current study sought to build upon this previous research through the examination of empirically derived parenting profiles and their associations with student alcohol-related behaviors prospectively across the first year of college and into the second year. In order to accomplish this goal, latent profile analysis was performed using the same set of perceived parenting characteristics employed in the previous study (Abar, 2012). These characteristics were selected to represent a broad spectrum of parent practices and aspects of parenting style, with a particular focus on the youth outcome of interest (alcohol use behaviors). The current study sought to identify the previously illustrated profiles using only the control group subset of the data in order to allow for prospective profile examination independent of intervention effects. Following the profile analysis, students were classified into their most likely profile and examined longitudinally using latent growth curve modeling. It was expected that students who perceived their parents as exhibiting the least optimal

constellation of parenting practices and style (e.g., high modeling of use, poor relationship quality) would display the highest initial levels of alcohol use behaviors and the steepest linear increases over time. No specific hypotheses regarding differences in quadratic trends are presented.

Method

Participants

Participants for the current study consisted of 285 students from the control condition of Project ACT, a four-group trial seeking to determine the optimal timing and dosage of a parent-based intervention for reducing college alcohol use and associated negative consequences. Only the control condition was used because the current outcomes of interest (e.g., weekend drinking, heavy episodic drinking) were targeted by the intervention (for further information about the content of the intervention, see Turrisi et al, 2001). Participants for the larger intervention were randomly selected incoming freshmen ($N = 1750$) at a relatively large, public northeastern university during the summer prior to college entrance in 2007 and 2008. Invitation letters explaining the study, procedures, and compensation and containing a URL and Personal Identification Number (PIN) for accessing the survey were mailed to all 1750 potential participants. The baseline survey was collected prior to college enrollment (July prior to the 1st year), and the follow-up assessments were conducted at approximately 3 (Time 2; October of the 1st year), 5 (Time 3; January of the 1st year), 8 (Time 4; April of 1st year), and 15 (Time 5; October of the 2nd year) months post baseline. Of the 1750 participants contacted, 1153 consented to participate in the study and completed the web-based baseline assessment, which yielded a 66% overall response rate, consistent with other studies using a web-based approach (Larimer et al., 2007; Thombs, Ray-Tomosek, Osborn, & Olds, 2005). The resulting sample of 285 represents the control participants, with 220 participants retained through wave 5 (77% retention rate).

Participants for the current study: (a) were enrolled at the university as first-time incoming first-year students between the ages of 17 and 23 years-of-age, (b) provided consent to participate in the larger study, and (c) completed the baseline assessment. The demographic characteristics were: 47% female; 87% White, 4% Asian, 2% African American, and 7% multi-racial or other; and 7% ethnically Hispanic. The mean age at baseline was 17.9 years ($SD = .40$), and 95% perceived their family to be of average or above socio-economic status relative to their peers.

Measures

Perceived Parenting Profile Indicators (Time 1 - Summer Prior to Matriculation)

Maternal/Paternal alcohol modeling: Students provided retrospective data regarding the alcohol-related behaviors of their mothers and fathers. Items assessing the frequency and quantity of alcohol use were: “In the past year, how often do you think your mother/father drank alcohol?” (9 point scale; 1 = not at all to 9 = everyday) and “In the past year, how many drinks do you think your mother/father had per drinking occasion?” (9 point scale; 0 =

0 drinks to 8 = 9 or more drinks). These items were multiplied to obtain an estimated total of the quantity of alcohol consumed by both mothers and fathers. Higher scores thus indicated higher total levels of drinking (Dawson, 2003). Similar measures of perceived parental alcohol use have been directly linked to adolescent alcohol use and indirectly to college-age alcohol use through earlier use (Brook et al., 2010). Research has also shown adolescent reports of parental frequency/quantity of alcohol use to be accurate (Engels, Van Der Vorst, Dekovic, & Meeus, 2007).

Perceived parent approval of alcohol use: Perceptions of general parental approval of student alcohol use were measured with four items (Wood, Read, Mitchell, & Brand, 2004). Participants were asked to indicate on a 5-point scale from *Strongly disapprove* (1) to *Strongly approve* (5) how their parents would respond if students drank one or two drinks, three or four drinks, and five or more drinks on one occasion, and five or more drinks once or twice each weekend. Items were summed to create a general approval composite ($\alpha = .83$) which has previously been associated with college heavy episodic drinking (Wood et al., 2004).

Alcohol communications: Parent-teen alcohol-related communication was assessed using a 13-item scale adapted from Turrissi, Wiersma, and Hughes (2000). Students indicated, from *Not at all* (1) to *A great deal* (4), the extent they discussed negative consequences of alcohol use and tips for an alcohol-free healthy lifestyle with their parents at some point during the past several months ($\alpha = .95$). These communications have been shown to be indirectly associated with alcohol-related consequences through beliefs about alcohol (Turrissi et al., 2000).

Parental monitoring and knowledge: To indicate level of parental *monitoring*, students responded on a 3 point scale to the question: “How much do your parents try to know what you do during your free time?” (don’t try, try a little, try a lot). To describe parental *knowledge*, they were asked “How much do your parents really know what you do with your free time?” (don’t know, know a little, know a lot). These measures were modified from those used by Wood and colleagues (2004) where they were shown predictive of student alcohol-related behaviors. A similar single item measure of monitoring has recently been shown to be related to adolescent frequency of alcohol use (Bergh, Hagquist, & Starrin, 2011).

Parental trust and support: Students reported on the extent to which they trusted and felt supported by their mothers and fathers using 8 items (4 maternal and 4 paternal) measured on a 4 point scale from *Disagree* (1) to *Agree* (4). In order to limit the number of indicators in the model, the scores for mothers and fathers were averaged to create a global index of parental trust ($r = .50, p < .001$) ($\alpha = .85$).

Parental access: Students reported on the extent to which they felt both their parents were accessible to them using 4 items (2 maternal and 2 paternal) measured on a 4 point scale from *Disagree* (1) to *Agree* (4). The scores for mothers and fathers were averaged to create a global parental access index ($r = .41, p < .001$) ($\alpha = .79$).

Mother/Father-teen conflict: Students reported on the extent to which they experienced conflict with both their mothers and fathers using 4 items (2 maternal and 2 paternal) measured on a 4 point scale from *Disagree* (1) to *Agree* (4). Items were: “My mother/father and I end up fighting when we talk” and “No matter what I say when we talk, my mother/father and I seem to end up arguing,” (Cronbach’s $\alpha_{\text{mothers}}=.87$; Cronbach’s $\alpha_{\text{fathers}}=.91$).

Student Alcohol Use Outcomes (Times 1 – 5)

Typical weekend drinking: Typical weekend drinking was the sum of drinks participants indicated they consumed on a typical Friday and Saturday within the past 30 days using the Daily Drinking Questionnaire (DDQ; Collins, Parks, & Marlatt, 1985). A standard drink definition was included (i.e., 12 oz. beer, 10 oz. wine cooler, 4 oz. wine, 1 oz. 100 proof liquor). This measure has been used frequently in the college alcohol literature (e.g., Fromme, Katz, & D’Amico, 1997; Larimer, Turner, Mallett, & Geisner, 2004).

Heavy episodic drinking (HED): Heavy episodic drinking was measured as how often in the past two weeks participants indicated that they consumed 4 or more drinks if female, or 5 or more drinks if male, in a given two hour period. This method of measuring heavy episodic drinking is in accordance with NIAAA guidelines for measuring this construct (NIAAA, 2007).

Estimated peak blood alcohol content (Peak BAC): Peak BAC was estimated using the number of drinks and amount of time spent drinking on the peak occasion within the past 30 days, from the Quantity/Frequency/Peak questionnaire (Dimeff, Baer, Kivlahan, & Marlatt, 1999) and participant gender and weight (Dimeff et al., 1999; Matthews & Miller, 1979). Estimated values over time ranged from 0.00 – 0.52.

Plan of Analyses

A series of latent profile analyses were performed using the set of perceived parenting indicator variables. Parent-general indices of parental approval of alcohol use, alcohol communications, parental knowledge, and parental monitoring were used due to available data. Maternal and paternal reports of trust and support and access were averaged in order to limit the number of profile indicators used, while separate reports of maternal and paternal alcohol modeling and conflict with teens were used based on previous research showing their unique predictive utilities (e.g., Chassin, Curran, Hussong, & Colder, 1996; Turner, Larimer, & Sarason, 2000).

Solutions were tested adding profiles one at a time until the most optimal solution was found. Statistically, the Akaike Information Criteria (AIC), Bayesian Information Criteria (BIC), and adjusted likelihood ratio test (aLRT; Lo, Mendell, & Rubin, 2001) were explored. The AIC and BIC are relative fit statistics, such that lower values indicate better fit. A significant aLRT value indicates an improvement in fit with the inclusion of the additional class. Substantive considerations included class sizes, distinguishability of profiles, and model interpretability (Lubke & Muthén, 2005).

Once the optimal number of profiles was identified, demographic covariates of the solution were used to more fully describe profile differences. Finally, in order to examine profiles longitudinally, individuals were classified into their most likely profiles, and profile differences in alcohol use were examined using latent growth curve modeling in Mplus (Muthén & Muthén, 1998–2010). Chronometric weights of 0, 1, 1.67, 2.67, and 5 for the linear growth factor were used to represent the uneven spacing of time points. In addition to examining inter-individual differences in intercept and linear slope, quadratic trends were modeled when their inclusion improved overall model fit. A full information maximum likelihood estimator that is robust to non-normality was used to account for missing data over time. Unconditional models were first estimated to describe the overall trajectories in alcohol-related behaviors across the first year of college. Model fit was evaluated using the χ^2 , Comparative Fit Index (CFI), and the Root Mean Square Error of Approximation (RMSEA). Profile membership was then dummy coded, and these variables were included as predictors of growth parameters, with participant sex and race (coded as 0 = non-White; 1 = White) incorporated as covariates.

Results

Latent Profile Analysis

Results indicated that the four profile model provided the best fit to the data. The BIC decreases until the fourth class and increases with the addition of the fifth, and the aLRT also indicated that the inclusion of the fifth class did not improve model fit (see Table 1). Furthermore, the four profile model was shown to have more distinct profiles, in terms of conditional means, than the five profile model according to measures of entropy (entropy₄ = .92; entropy₅ = .91). Entropy values approaching 1.0 indicate little profile overlap (Celeux & Soromenho, 1996). Finally, the average probability of membership within profiles was very high (.99, .97, .94, and .96, respectively) indicating clear distinction. In general, a similar pattern of latent profiles, in terms of the number of profiles, profile sizes, and substantive interpretation, was observed in the current study as in Abar, 2012. In addition, approximately 46% of individuals in the current sample were shown to be in the same/analogous profile in both the current sample and Abar, 2012. This proportion is substantial, particularly given that latent profiles are defined based on mean levels relative to the sample currently being analyzed.

The first profile (14% of the sample) was labeled the *High Quality* profile (see Table 2). Students in this profile reported high levels of parental trust and support, parental access, and alcohol communications, as well as low levels of mother-teen and father-teen conflict. Thus, the dominant characteristic of this profile was its highest quality affective relationships with parents, with levels of the other indicators falling nearer to sample means.

The second profile (35%) was labeled the *High Monitoring* Profile. Students in this profile reported that their parents engaged in ceiling levels of monitoring and knowledge about how they spent their free time, coupled with the lowest level of approval and highest maternal conflict.

The third profile (31%) was labeled the *Low Involvement* Profile. Students in this profile perceived their parents try to know and know the least about their behaviors, as well as exhibiting low levels of access, trust and support, and communications about alcohol-related issues. Students in this profile also perceived their parents as modeling low levels of alcohol use and high father-teen conflict.

The fourth and final profile (21%) was labeled the *Pro-Alcohol* Profile. Students in this profile perceived their parents to model the heaviest maternal and paternal alcohol use across profiles, with average levels more than one standard deviation greater than the nearest profile means. An examination of the individual items making up maternal and paternal alcohol modeling indicated that approximately 11% of mothers and 27% of fathers in this profile were perceived as binge drinking (4 drinks/day for women; 5 drinks/day for men) one or more times per week. These students also perceived the highest levels of parental approval of alcohol use and alcohol-related communications.

Gender, ethnicity (coded as White/non-White), and perceived socioeconomic status were then included in the model as covariates predicting profile membership. The *Pro-Alcohol* profile served as the reference profile, as it was expected to be the riskiest profile in terms of student outcomes and its pattern of indicator levels was very distinct from those of the remaining profiles. Profile membership was only significantly predicted by sex, as females had 2.35 times greater odds of being in the *High Monitoring* profile than in the *Pro-Alcohol* profile ($p < .01$).

Unconditional Latent Growth Curve Analyses

Before performing the latent growth curve models, comparisons were made between individuals with complete data and those missing data on the outcomes variables at any time point. The attrition rate was statistically equivalent across profiles, χ^2 p 's $> .05$. Furthermore, there were no baseline differences on demographic or alcohol measures across individuals with complete outcome data and those with missing data, t -test p 's $> .05$. These results imply that examining parenting profiles longitudinally was appropriate in this sample.

Results indicated that each of the latent growth models provided acceptable fit to the data (Weekend Drinking: $\chi^2_{10} = 26.98$, $p = 0.003$, CFI = 0.95, RMSEA < 0.08 ; Heavy Episodic Drinking: $\chi^2_{10} = 11.75$, $p = 0.30$, CFI = 0.99, RMSEA < 0.03 ; Peak BAC: $\chi^2_{13} = 33.58$, $p = 0.001$, CFI = 0.92, RMSEA < 0.08). In regard to typical weekend drinking, a significant mean intercept, linear slope, and quadratic trend were observed (see Table 3 for parameter means and variances). Overall, weekend drinking increased across the first year of college, with the increase steeper early in college. Significant variability was also seen on each parameter. In regard to heavy episodic drinking, there was a significant mean intercept and linear slope, but the quadratic trend was not significant. There was also significant intercept variability. In regard to peak BAC, there was a significant mean intercept, linear slope, and quadratic trend. There was also significant intercept variability. Peak BAC models did not converge when estimating quadratic variability, so this parameter was fixed at zero.

Conditional Latent Growth Curve Analyses

Models were then performed with parenting profile dummy variables (reference group = *Pro-Alcohol*) predicting the alcohol growth parameters (see Figure 1). Perceived parenting profile membership predicted typical weekend drinking, such that the *Pro-Alcohol* profile had a significantly higher intercept than the *High Quality*, *High Monitoring*, and *Low Involvement* profiles and a significantly greater linear increase than the *High Quality*, *High Monitoring*, and *Low Involvement* profiles (see Table 4 for unstandardized beta weights). There were also significant effect of participant sex and race. Females displayed a significantly lower intercept ($b = -1.40, p < 0.05$) and weaker linear increase over time ($b = -0.98, p < 0.05$), and White students displayed a greater linear increase over time than non-White students ($b = 1.25, p < 0.05$).

Regarding heavy episodic drinking, the *Pro-Alcohol* profile displayed a significantly higher intercept than the *High Quality* and *High Monitoring* profiles. Similar results were observed for peak BAC, such that the *Pro-Alcohol* profile displayed a significantly higher intercept than the *High Quality*, *High Monitoring*, and *Low Involvement* profiles. No effects were observed on increase over time in heavy episodic drinking and peak BAC.

Discussion

The current study examined the extent to which perceived parenting profile membership was associated with student alcohol-related behaviors across the first year of college. Although parenting practices and styles have shown predictive of college alcohol use at the overall sample level (e.g., Patock-Peckham & Morgan-Lopez, 2007; White et al., 2006), little work has examined the extent to which parenting in high school was related to trajectories of alcohol use across the first year of college (Abar & Turrise, 2008). Furthermore, no research to date has examined the extent to which theoretically-informed profiles of parents are differentially associated with trajectories of alcohol-related behaviors in college. The current study sought to fill this gap through the use of LPA on a broad set of parenting characteristics and latent growth curve analysis on a set of alcohol use indicators over time.

Perceived Parenting Profiles

Similar to previous research (Abar, 2012; Varvil-Weld et al. 2012), results illustrated four distinct profiles of perceived parenting characteristics, with two of the profiles characterized by relatively positive parenting practices and/or styles (*High Quality* and *High Monitoring* profiles). The remaining two profiles represent differing constellations of traditionally negative parenting characteristics. Students in the *Low Involvement* profile, which largely corresponds to the *Anti-Alcohol* profile in Abar (2012), perceived little parental supervision and positive affect from their parents, whereas students in the *Pro-Alcohol* profile perceived a uniform pattern of behaviors supportive/accepting of alcohol use. The primary difference between the *Low Involvement* and *Anti-Alcohol* profiles is that the currently illustrated *Low Involvement* profile displays a more moderate level of approval of alcohol use than the *Anti-Alcohol* profile in Abar, 2012. This discrepancy was small and possibly due to sampling error in the sub-sample currently used.

In addition to identical number of profiles observed in the current and previous research (Abar, 2012) and in the conceptualization described by Maccoby & Martin (1983), there are several similarities and differences between the two sets of parenting groups. While the *High Quality* and *High Monitoring* profiles observed here seem to share several traits with the conceptualizations of authoritative and authoritarian parenting styles, respectively, the *Low Involvement* and *Pro-Alcohol* groups do not seem to display the same level of correspondence with permissive and neglectful parenting styles. Parents perceived as falling in the *Low Involvement* profile seem to display a pattern of poor relationship quality with their teen similar to the neglectful parenting style, but they also display more responsible modeling of alcohol use and higher absolute levels of monitoring and knowledge than would be anticipated from a neglectful parent. Similarly, parents in the *Pro-Alcohol* profile display some permissive characteristics (e.g., high approval of underage alcohol use), but they also demonstrate higher absolute levels of monitoring and knowledge than would be anticipated from a permissive parent. It is possible, and potentially likely, that it is rare to observe youth with neglectful or permissive parents, as defined by Maccoby & Martin (1983), among the college attending population. Future research might benefit from explicitly associating parenting profiles derived from a broad set of parenting characteristics (like the current study) with parenting styles derived from measures like the Parental Authority Questionnaire (Buri, 1991) designed to create groups corresponding to the Baumrind/Maccoby and Martin typologies.

Predicting Student Alcohol Use Behaviors over Time

Profile differences in student alcohol use were then examined across the first-year of college. The prospective findings from the current study support previous research linking parenting characteristics during high school with substance use in college (e.g., Walls et al., 2009; White et al., 2006), as well as previous research relating parent groups with substance use earlier in adolescence (e.g., Bahr & Hoffman, 2010; Baumrind, 1991; Chassin et al., 2005). Moreover, the findings from the current study imply the potential for lasting parental influences even when children are outside immediate parental proximity. Specifically, the perceived parenting profile one is in immediately prior to college is strongly associated with one's drinking trajectory across the first year, which may indicate this period as important for parent-based intervention. In particular, students who perceive their parents to be relatively heavy alcohol users, accepting of underage drinking, and with whom they have relatively poor relationships demonstrated the highest initial levels of alcohol-related behaviors, as well as the greatest increases in weekend drinking over time. These findings were supportive of previous research showing heavy parental modeling (White et al., 2000), permissibility regarding teen alcohol use (Wood et al., 2004; Abar et al., 2009; Boyle & Boekeloo, 2006), and poor relationships between parents and teens (Barnes et al., 2000; Kashubeck & Christensen, 1995) to be predictive of relatively risky alcohol-related behaviors. The current study expands upon this work and supports the contextual model of parenting (Darling & Steinberg, 1993) by demonstrating the extent to which combinations of negative parenting practices and facets of parenting style exist in the population and the extent to which students in this sub-set differ over time from those whose parents demonstrate more adaptive parenting practices and style. Future intervention efforts might benefit from identifying parents of incoming college students who are characterized by this

negative profile and tailoring materials or increasing intervention dosage to these parents to improve outcomes for this most at-risk subset of the student population. This tailored approach might also enhance the efficacy of existing parent-based prevention programs at the college level targeting many of the parenting profile indicators examined (e.g., Ichiyama et al., 2009; Turrisi et al., 2001). A similar tailoring of intervention materials earlier in adolescence might provide even greater effects by altering influential parenting behaviors before the onset and escalation of youth alcohol use.

Among the remaining three perceived parenting profiles (*High Quality*, *High Monitoring*, and *Low Involvement* profiles), there were small alcohol-related differences at baseline and relatively similar trajectories over time. As mentioned in Abar (2012), these similarities across relatively disparate parenting profiles highlight the notion of “equifinality” (Cicchetti & Rogosch, 1996), which states that there are a variety of ways in which individuals can arrive at the same developmental outcome. In the case of parenting, these findings support the potential for positive parenting qualities (e.g., high relationship quality, high monitoring and knowledge, and, to a lesser extent, low modeling of alcohol use) to buffer the deleterious effects of other less adaptive qualities.

Limitations and Future Directions

There are several limitations to the current study. First, this study is purely associative, as no experimental manipulation was performed and no additional predictors of college alcohol use were controlled for. While there is no way to randomly assign students to parenting profiles, future research might benefit from use of advanced methods, like propensity score modeling (Rosenbaum & Rubin, 1983), to assign causality in observational research. Second, while the current study is one of the first to examine parental associations with student alcohol use trajectories, it is limited to the examination of use across only the first year of school and into the fall of the second. Researchers should seek to collect and analyze data across the length of the college years in order to more thoroughly examine the potential lasting effects of parenting characteristics. The study was also limited by the reliance on a single assessment of parenting characteristics despite anticipated changes in parenting behaviors as students transition to college. Future work should seek to examine potential associations between trajectories of parenting and trajectories of youth substance use in college. Third, the parenting profile indicators were from the perspective of the student participants, and future studies might seek to examine profile makeup and longitudinal associations when indicators are taken from parents’ perspectives. It is important to note, however, that there is research implying that youth reports of parenting behaviors are better predictors of risk behaviors than actual parent reports (Latendresse et al., 2009). Fourth, the current study used single item indicators of parental monitoring and knowledge, such that additional profile work might benefit from the use of multi-item scales with greater potential ranges of values. Fifth, although the current study utilizes a method capable of illustrating interactions between indicators, the current study did not test specific interactions between parenting practices and parenting styles implied by the contextual model of parenting (Darling & Steinberg, 1993). Future research should examine these interactions with regard to the prediction of emerging adult alcohol use behaviors. Finally, this study focused on the associations between perceived parenting profiles and college alcohol-related behaviors

while not addressing parental influences on the development of non-college youth. Additional research should be conducted examining the constituency of perceived parenting profiles in non-college youth, as well as their associations with the alcohol use of emerging adults who are not attending college.

Conclusions

The current study adds to the growing literature base supporting the continued importance of parents in the development of their college-attending youth. Findings from the current study highlight the differential types of parents students perceive having and the extent to which these differential perceptions are associated with alcohol use in college. With rapid developments in information and social-networking technology (e.g., smart phones, Facebook, Twitter, Skype, etc.), parents today have greater opportunities than previous generations to influence these student perceptions by maintaining consistent, high quality contact with their children even as they are away at school. Prevention scientists should seek to capitalize on these developments and the emerging research on parents during the college years to develop and implement parent-based intervention to preclude the negative consequences associated with alcohol use in college.

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Figure 1. Alcohol Use Behaviors over Time by Parenting Profile
 Raw profiles means, using available data, plotted across times 1 – 5.

Table 1

Perceived parenting profile fit indices

	-2 Log-likelihood	AIC	BIC	aLRT
1 Profile	-6273	12586	12659	---
2 Profiles	-6149	12377	12519	$p < .01$
3 Profiles	-5807	11732	11947	$p < .05$
4 Profiles	-5566	11270	11522	$p < .05$
5 Profiles	-5513	11206	11535	$p = .47$

Table 2

Conditional means and standard deviations for perceived parenting profiles

	High Quality	High Monitoring	Low Involvement	Pro-Alcohol
	14%	35%	31%	21%
Maternal alcohol modeling	4.07 (3.93)	5.07 (4.26)	4.03 (3.17)	16.97 (9.33)
Paternal alcohol modeling	7.80 (6.24)	7.88 (6.54)	7.13 (5.21)	24.27 (13.65)
Approval of alcohol use	6.37 (2.43)	6.15 (1.93)	6.82 (2.68)	8.27 (2.43)
Alcohol communications	28.24 (10.87)	27.02 (10.83)	21.69 (8.13)	28.26 (9.43)
Monitoring	2.69 (.56)	3.00 (.14)	2.36 (.57)	2.55 (.56)
Knowledge	2.79 (.51)	3.00 (.14)	1.98 (.51)	2.38 (.51)
Trust and Support	15.46 (.66)	13.70 (1.85)	12.40 (2.44)	12.93 (2.17)
Access	8.00 (.14)	6.72 (1.27)	6.35 (1.41)	6.88 (1.26)
Mother-teen conflict	2.00 (.14)	4.18 (1.78)	3.99 (1.77)	3.87 (1.46)
Father-teen conflict	2.00 (.14)	3.36 (1.49)	3.58 (1.67)	3.51 (1.73)

Table 3

Latent growth curve parameters

	Intercept		Linear Slope		Quadratic Trend	
	Mean	Variance	Mean	Variance	Mean	Variance
Heavy Episodic Drinking	.68***	1.16**	.22***	.17	-.02	.01
Typical Weekend Drinking	3.21***	17.65***	2.35***	7.36***	-.31***	.23**
Peak BAC	.66***	.49***	.23***	.01	-.03***	N/A

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

Table 4

Profile beta coefficients predicting latent growth parameters

	Intercept	Linear Slope	Quadratic Trend
<i>Typical Weekend Drinking</i>			
High Quality vs. Pro-Alcohol	−3.86***	−1.75*	.41
High Monitoring vs. Pro-Alcohol	−3.20***	−1.47*	.64
Low Involvement vs. Pro-Alcohol	−1.95*	−1.61*	.60
<i>Heavy Episodic Drinking</i>			
High Quality vs. Pro-Alcohol	−1.01***	−.15	−.03
High Monitoring vs. Pro-Alcohol	−.81**	−.08	.01
Low Involvement vs. Pro-Alcohol	−.48	−.06	.00
<i>Peak BAC</i>			
High Quality vs. Pro-Alcohol	−.59***	−.05	N/A
High Monitoring vs. Pro-Alcohol	−.53***	.00	N/A
Low Involvement vs. Pro-Alcohol	−.35*	−.03	N/A

†
 $p < .10$,*
 $p < .05$,**
 $p < .01$,***
 $p < .001$