Attachment Theory and Theory of Planned Behavior: An Integrative Model Predicting Underage Drinking

Andrew Lac
Loyola Marymount University

William D. Crano, Dale E. Berger, and Eusebio M. Alvaro
Claremont Graduate University

Research indicates that peer and maternal bonds play important but sometimes contrasting roles in the outcomes of children. Less is known about attachment bonds to these 2 reference groups in young adults. Using a sample of 351 participants (18 to 20 years of age), the research integrated two theoretical traditions: attachment theory and theory of planned behavior (TPB). The predictive contribution of both theories was examined in the context of underage adult alcohol use. Using full structural equation modeling, results substantiated the hypotheses that secure peer attachment positively predicted norms and behavioral control toward alcohol, but secure maternal attachment inversely predicted attitudes and behavioral control toward alcohol. Alcohol attitudes, norms, and behavioral control each uniquely explained alcohol intentions, which anticipated an increase in alcohol behavior 1 month later. The hypothesized processes were statistically corroborated by tests of indirect and total effects. These findings support recommendations for programs designed to curtail risky levels of underage drinking using the tenets of attachment theory and TPB.

Keywords: attachment theory, theory of planned behavior, young adults, underage drinking

Examining how parents influence their young adult offspring is important for understanding whether parenting efforts yield pervasive protective effects extending into adulthood (Love & Murdock, 2004) or relatively ephemeral outcomes (Harris, 1995). Parents are responsible for socializing their children and to help them develop the repertoire of skills necessary for dealing with problems and obstacles in life (Grossmann, Grossmann, Kindler, & Zimmermann, 2008; McHale, Dariotis, & Kauh, 2003). Cultivation of this bond enables parents to impart personally and socially important worldviews onto their children (Garnier & Stein, 2002; Hardy, Padilla-Walker, & Carlo, 2008; Knafo & Schwartz, 2003). Internalization of such information is expected to yield a secure psychological and behavioral foundation to schematically help manage the transition from adolescence to adulthood. Bonds with mothers are especially important. Offspring tend to develop more secure attachment bonds to mothers than fathers (Doyle, Lawford, & Markiewicz, 2009), and mothers usually serve as the pivotal parental figure in attachment theories and frameworks (Bowlby, 1988).

Young adults encounter many forces that capture their social attention (N. L. Collins & Read, 1990; W. A. Collins, Laursen, Mortensen, Luebker, & Ferreira, 1997). As young adults are forming an independent self-identity, they might be less reliant on parents (Cassidy & Trew, 2001; Thomason & Winer, 1994). The university experience, in particular, affords additional opportunities to make independent decisions (Abar & Maggs, 2010; Walls, Fairlie, & Wood, 2009). Parental expectations for their children’s emotional and functional autonomy during the transition to college or university have been found to be significantly higher than their children’s own expectations of autonomy (Kenyon & Koener, 2009). If a paramount goal of parenting is to help children develop the foundation to eventually become competent adults, then expectations for their autonomy in decision making are not incongruous with healthy parenting practices (Bell, Forthun, & Sun, 2000; W. A. Collins et al., 1997; Kenyon & Koener, 2009). With the current research, we investigate whether the mother–offspring bond continues to wield a guiding force against underage alcohol use in adult college students. The research is guided by two major theoretical frameworks: attachment theory and theory of planned behavior (TPB). These two theoretical traditions are sequentially linked in a predictive model using attachment theory factors as precursors to the TPB factors.

Attachment Theory

Attachment theories are based on the view that human beings have an intrinsic and universal desire to be accepted by others. Parent attachment is broadly conceptualized as the overall level of parental responsiveness toward the offspring (Bowlby, 1988). The youth’s internalization of the security of attachment is expected to be imprinted heuristically through interaction with the caregiver, in time becoming relatively resistant to change, showing enduring effects across the lifespan (Bowlby, 1988). Through formation of secure bonds to parents, children acquire a healthy internal working model of themselves and others. Youth with secure attachment to parents develop the skills necessary to regulate their emotions.
and manage their impulses (Grossmann et al., 2008). Those with insecure attachment to parents have problems with emotional regulation and impulse control (van der Kolk & Fisler, 1994), acting on immediate rewards at the expense of long-term goals (Gailliot, Mead, & Baumeister, 2008).

Attachment security is thought to be fostered through the formation and maintenance of three pivotal and interrelated processes: trust, communication, and nonalienation (Armsden & Greenberg, 1987). These three components of attachment security are embodied in much of the modern research on the ways in which parents are protective against delinquent behaviors. The literature has shown that the parent–child factors of trust (Borawska, Levers-Landis, Lovegreen, & Trapi, 2003), communication (Lac et al., 2011), and nonalienation (Baker, 2005) attenuate internalizing and externalizing problems in youth. These three components of attachment underlie the conceptual definitions of many other parenting constructs. Trust is embedded in the operational definition of familism, the importance placed on maintaining family ties and the commitment and loyalty to family (Ramirez et al., 2004). The communication of information regarding the child’s activities and whereabouts is necessary for parental monitoring, sometimes more aptly referred to as parental knowledge (Hemovich, Lac, & Crano, 2011; Lac & Crano, 2009). Nonalienation toward the parent promotes feelings of unconditional acceptance, but alienation or anger stems from parental rejection of the child, leading to the child’s rejection of the parent in response (Dwairy, 2010).

Armsden and Greenberg (1987) proposed that these three critical components of attachment—trust, communication, and nonalienation—could be used to advance the understanding of attachment to peers. In their research involving university students, peer attachment positively correlated with the frequency that students sought out their peers for emotional support. Peer attachment was positively associated with self-esteem, locus of control, and optimism, but these variables tended to be more strongly associated with parental attachment (Fass & Tubman, 2002). Accordingly, achieving secure attachment to both parents and peers could result in greater social competency and adoption of a resilient outlook (Benson, McWey, & Ross, 2006). Inadequate bonding to a parental figure, however, might produce a risky shift to overreliance on peers engaged in normative behaviors (Bell et al., 2000).

**TPB**

Ajzen and Fishbein’s (1980) theory of reasoned action (TRA) and TPB were developed to explicate how persuasive forces and motivational beliefs drive intentions and behavior. The TRA posits that attitudes (evaluation of anticipated behavioral outcomes) and subjective norms (the normative influence of important others regarding a behavior) simultaneously affect intentions (action tendency to perform a behavior). Intentions, in turn, are postulated to impinge directly on subsequent behavior. In an addendum to the theory (Ajzen, 1991), the TPB incorporated the construct of perceived behavioral control (ease in performing the behavior) to predict both intentions and behavior. Behavioral control has incremental predictive validity over intentions if the behavior in question is not completely under volitional control, such as physical obstacles hindering behavioral implementation (Ajzen, 1991; Madden, Ellen, & Ajzen, 1992). Another distinction is that the intentions construct is postulated to be fully mediating in TRA but only partially mediating in TPB.

Numerous studies have applied the TPB to understand an array of behaviors in adolescents and young adults (Cha, Dowswell, Kim, Charron-Prochownik, & Patrick, 2007; Kassem & Lee, 2004; Lac, Alvaro, Crano, & Siegel, 2009). Lending support to the predictive validity of the TPB is a meta-analytic review of 185 studies that involved application of the theory (Armitage & Conner, 2001). The TPB is relevant in the current study owing to potential persuasive forces impinging on young adults’ beliefs about alcohol. Furthermore, behavioral control in accessing alcohol is not completely under volitional control among underage drinkers because of minimum age legal restrictions.

**Alcohol Use**

Alcohol consumption was selected as the delinquent behavior for investigation in this cohort because of its widespread occurrence in university environments (Pedersen, LaBrie, & Lac, 2008), the high overestimation of peer approval of the behavior (LaBrie, Cail, Hummer, Lac, & Neighbors, 2009), its legal and social ramifications (Berger & Marelich, 1997), and the potential for misuse to lead to serious negative consequences (Fiorentino, Berger, & Ramirez, 2007). In the United States, enactment of the National Minimum Drinking Age Act (1984) made it illegal for people under 21 years of age to purchase and publicly possess alcohol (Toomey, Nelson, & Lenk, 2009). This law was changed largely because of initial evidence indicating that increasing the legal drinking age from 18 to 21 years old would substantially decrease traffic fatalities caused by young adults. The effectiveness of this social deterrence was subsequently demonstrated by a sharp drop in alcohol consumption and auto accidents and deaths among young adults, but debate continues as to whether the change in law is solely responsible (Crano, 2012; McCartt, Hellenga, & Kirley, 2010; Toomey et al., 2009).

Underage drinking is a major problem on university campuses. The campus culture affords opportunities to participate in events in which alcoholic beverages are prevalent and serve as a social lubricant (Wechsler & Nelson, 2008). Young adults enrolled in university drink at a higher rate than do same-aged counterparts who are not enrolled (L. D. Johnston, O’Malley, Bachman, & Schulenberg, 2010). As a result of underage drinking, approximately 5,000 people under the age of 21 die annually in the United States, with the greatest proportion attributed to motor vehicle accidents (National Institute on Alcohol Abuse and Alcoholism [NIAAA], 2006).

**Present Study and Hypotheses**

Drawing on attachment theory and the TPB, in the current research, we examined peer and maternal attachment in the context of alcohol consumption in underage adults (18 to 20 years old) attending a university. Maternal attachment was assessed as the mother is typically the primary caregiver during the child’s youth. Using a full structural equation model (SEM), we hypothesized separate peer and mother factors of attachment theory as antecedents to the alcohol belief factors (attitudes, norms, and behavioral control) of TPB. Incorporating attachment factors only as precur-
sors to the belief factors is consistent with recommendations for testing extensions to TPB models proposed by Hennessy et al. (2010). They argued that extensions to TPB models should not specify external variables (e.g., past behavior) as covariates that compete with beliefs in the prediction of intentions or behavior. Doing so violates the theoretical tenets of TPB and the theoretical sufficiency of its pathways, because statistical control variables are not an internal feature of the theory. Hennessy et al. contend that the inclusion of external factors as antecedents to the belief factors is entirely compatible with the theory.

In the current research, we hypothesized that secure peer attachment should foster pro-alcohol beliefs, because establishing close bonds with peers is achieved through seeking typicality of membership to produce a shared collective identity with peer members. As a result of internalization of peer belief systems for the sake of conformity to the group and to avoid rejection (Brown, Lohr, & McClanahan, 1986), young adults are susceptible to pro-alcohol persuasions from ingroup peer members (Marks, Graham, & Hansen, 1992). Secure maternal attachment, in contrast, is hypothesized to inversely predict alcohol beliefs, as strong bonds with this caregiver impart a schematic basis to guide the adoption of more conventional antirisk beliefs (Bell et al., 2000). Secure maternal attachment should enable young adults to better manage their impulses and become more resistant to alcohol temptations.

Considering the research involves young adults who fail to meet the minimum age requirement for purchasing alcohol, behavioral control was conceptualized as the control over access to alcohol rather than control over intake when access has already been granted. Research suggests that the accessibility of alcohol is positively related to consumption, as difficulty in obtaining access to alcohol is a hurdle preventing many underage individuals from drinking (Morleo, Cook, Bellis, & Smalllalthwaite, 2010). Consistent with TPB, these three alcohol belief factors were each hypothesized to predict intentions to consume alcohol, as supported by past research (Conner, Warren, & Close, 1999; K. L. Johnston & White, 2003). Both behavioral control and intentions were hypothesized to directly increase alcohol behaviors longitudinally; this hypothesis was also supported by previous investigations (Conner et al., 1999; Mcmillan & Conner, 2003).

Method

Participants

Two rounds of data were collected on 396 participants, 18–20 years old, all legally defined as adults but still under the minimum age for drinking in the United States. Of these, 45 participants failed to complete both rounds or completed both rounds but had missing values on the measures. This loss resulted in 351 participants (89%) who provided complete responses longitudinally. Retention analyses between completers and noncompleters uncovered no significant demographic differences on the categorical variables of age, $\chi^2(2, N = 396) = 3.64, ns$; gender, $\chi^2(1, N = 396) = 0.00, ns$; or race, $\chi^2(3, N = 391) = 5.82, ns$.

Participants used in the analyses ($N = 351$) averaged 18.7 years of age ($SD = 0.71$ years): 48.1% were 18-year-olds, 38.2% were 19-year-olds, and 13.7% were 20-year-olds. Men made up 26.8% of the sample. Participants racially self-identified as White (60.7%), Latino (17.9%), Asian (15.7%), and Black (4.6%), with 1.1% declining to report.

Design and Procedure

Undergraduate students were recruited to participate for either extra credit or subject pool credit. The gender distribution of the sample corresponded with the distribution of students in these classes. In the online and hard copy bulletin announcement, potential respondents were informed that the study would entail the completion of two online surveys separated by 4 weeks. Participants completing the study for extra credit were recruited by their instructor. Subject pool participants signed up for the study via an online study administration program.

After signing up for the study, each participant received an e-mail with a unique link to the electronic survey. They had 7 days to complete the study at their convenience. Four weeks later, the same participants were e-mailed a link to the Time 2 (T2) survey and again afforded 7 days to complete it. During each measurement period, participants received at least two e-mails reminding them to complete the measures within the allotted time. All measures were assessed at Time 1, except the three indicators of alcohol use behavior, which were assessed at T2.

Measures

Attachment theory. Quality of attachment was measured with the revised Inventory of Parent and Peer Attachment (Armsden & Greenberg, 1987). This inventory contains separate instruments, completed by the youth, to report the security of attachment to their peers and mother, each tapped with three subscales (trust, communication, and nonalienation). Previous validation research has evaluated the properties of these scales using samples of children and young adolescents (Armsden & Greenberg, 1987) and older adolescents (Gullone & Robinson, 2005).

Peer attachment ($\alpha = .83$). To assess the security of attachment to peers, we had respondents answer questions that asked about the relationship with close friends. Cronbach’s alpha values were acceptable for the subscales tapping trust ($\alpha = .92$; 10 items; e.g., “I trust my friends”), communication ($\alpha = .91$; eight items; e.g., “When we discuss things, my friends care about my point of view”), and nonalienation ($\alpha = .69$; seven items; e.g., “I feel angry with my friends”). Response options were anchored on a scale from 1 (almost never/never true) to 5 (almost always/always true). Negatively phrased items were reverse scored, so that higher values represent more secure attachment to peers.

Maternal attachment ($\alpha = .91$). To assess security of maternal attachment, we had respondents answer questions about the relationship with their mothers. Reliability coefficients were found to be acceptable for the subscales measuring maternal trust ($\alpha = .93$; 10 items; e.g., “I trust my mother”), communication ($\alpha = .93$; nine items; e.g., “When we discuss things, my mother cares about my point of view”), and nonalienation ($\alpha = .83$; six items; e.g., “I feel angry with my mother”). Responses were on a scale from 1 (almost never/never true) to 5 (almost always/always true). Negatively phrased items were reverse scored, so that higher values reflect more secure maternal attachment.

TPB. Prior to answering questions regarding alcohol beliefs and use, participants read the following instructions to help under-
stand the types of beverages constituting a drink. “Questions are about drinks of alcoholic beverages. By a ‘drink,’ we mean beer, wine, wine cooler, shot of liquor, cocktail, or any beverage containing alcohol.”

**Attitudes** ($\alpha = .86$). The attitudinal evaluation of potential outcomes associated with partaking in the behavior of interest was represented with three items: (a) “drinking alcohol is beneficial”; (b) “drinking alcohol is relaxing”; (c) “drinking alcohol is pleasurably.” Respondents indicated their level of endorsement on a scale from 1 (strongly disagree) to 7 (strongly agree).

**Norms** ($\alpha = .79$). Normative information may be divided into two related types. Descriptive norms is the perception of how often important others engage in a behavior, whereas injunctive norms is the perception of the extent to which important others approve of the behavior (Jacobson, Mortensen, & Cialdini, 2011). Both types of norms were measured only with peer reference groups, to determine whether secure maternal attachment is predictive of lower alcohol peer norms in the model. To assess descriptive norms, we had participants read the question, “how much do the following people drink?” followed by each of three reference groups: (a) “typical students,” (b) “friends,” and (c) “closest friends.” Descriptive norms were on a 7-point scale: 1 = never, 2 = less than once a month, 3 = once a month, 4 = 2–3 times a month, 5 = once a week, 6 = 2–3 times a week, and 7 = daily. Injunctive norms were measured using a similar format but with the question, “how much do the following people approve of drinking?” followed by the same three reference groups. The responses for injunctive norms ranged from 1 (strongly disagree) to 7 (strongly agree). Mean composites consisting of descriptive norms ($\alpha = .74$) and injunctive norms ($\alpha = .76$) also yielded acceptable reliabilities.

**Behavioral control** ($\alpha = .86$). The self-confidence or ability to gain access to alcoholic beverages was captured with three statements: (a) “it’s easy for me to drink alcohol”; (b) “it’s easy for me to try a new alcoholic drink”; and (c) “it’s easy for me to drink a lot.” The options for these items were anchored on a scale of 1 (strongly disagree) to 7 (strongly agree).

**Intentions** ($\alpha = .88$). Three items assessed the goal of engaging in the behavior in the future: (a) “i intend to drink this much in the next 30 days”; (b) “i intend to drink in the next 30 days”; and (c) “i intend to drink more than average in the next 30 days.” The first item was on a scale from 1 (never) to 7 (daily), and the last two were on a scale from 1 (very unlikely) to 7 (very likely).

**T2 behavior** ($\alpha = .86$). Assessed at the 1-month follow-up, three items tapped alcohol consumption behaviors: (a) “on how many days in the past 30 days did you drink?” (frequency); (b) “on the days you drank during the past 30 days, how many drinks did you usually consume per occasion?” (quantity); and (c) “on the days you drank during the past 30 days, what was the most number of drinks you consumed on any occasion?” (maximum). These three open-ended responses were each standardized.

**Analytic Plan**

**Modeling strategy.** In all analyses, higher scores on the attachment theory measures represented greater security of attachment, and higher scores on the TFB measures represented greater support for alcohol use. Parcels representing trust, communication, and nonalienation served as indicators of the latent factors of peer attachment and maternal attachment. Parcels also were constructed for descriptive and injunctive norms. Formed by taking the mean of its individual items, each parcel was allowed to load on its respective factor. The practice of constructing parcels parsimoniously aggregates the many manifest items into manageable indicators for latent approaches (Little, Cunningham, Shahar, & Widaman, 2002).

All models were estimated using maximum likelihood and specified with the EQS 6.2 program (Bentler, 2001). Consistent with recommendations for testing structural equation models proposed by Anderson and Gerbing (1988), a two-step approach was undertaken. In the first step, the measurement component was judged using confirmatory factor analysis, to determine if the magnitude of the loadings adequately represented the factors. At this step, a less than optimal measurement component should be modified to derive psychometrically sound latent factors. The second step involves testing the structural component by examining the predictive factor-to-factor paths.

**Confirmatory factor analyses.** Two separate sets of confirmatory factor analyses were designed to evaluate the construct validity of the factors used to represent the theoretical frameworks (Anderson & Gerbing, 1988; Crano & Brewer, 2002). A confirmatory factor analysis was estimated for the two factors of peer and parental attachment, each with the parcels of trust, communication, and nonalienation as indicators. A confirmatory factor analysis was then estimated for the five factors in TFB, with the parcels of descriptive and injunctive norms as indicators for the norms factor.

**Integrative model.** After determining suitable measurement components, we ran a structural equation model that combined factors from both theories in a predictive analysis. To rule out additional pathways that might render a superior explanation over the hypothesized model, we estimated an initial integrative model as follows. After correlating peer attachment and maternal attachment, we set both factors to simultaneously predict all the TFB factors of attitudes, norms, and behavioral control, intentions, and T2 behavior. Next, attitudes, norms, and behavioral control were specified to predict intentions and T2 behavior. The intentions factor was set to explain variance in T2 behavior. Consistent with the tenets of TPB, attitudes, norms, and behavioral control were allowed to intercorrelate, but as it is impossible to covary endogenous factors directly in the Bentler–Weeks model, their disturbance terms were correlated as a proxy (Bentler, 2001). After estimation of this initial predictive framework, it was trimmed of all nonsignificant paths and then reestimated to determine whether the hypothesized linkages were supported.

**Model evaluation criteria.** Several criteria were used to evaluate the extent that the hypothesized models approximated the data. Preferred is a nonsignificant chi-square test, indicating that the model should not be rejected, but the test is sensitive to erroneous rejection if the sample size is not small (Bollen, 1989). Also evaluated are the comparative fit index (CFI) and the nonnormed fit index (NNFI), which range from 0 to 1, with higher values indicating better fit (Ullman & Bentler, 2003). Hu and Bentler (1998) found that the standardized root-mean-square residual (SRMR), a residual-based index, is useful in detecting model misspecification and suggested that values below .08 are desirable.
Results

Confirmatory Factor Analysis of Attachment Theory Scale

The fit indices of the confirmatory factor analysis for the attachment theory scales were mixed, $\chi^2(8) = 89.35$, $p < .001$, CFI = .94, NNFI = .90, SRMR = .06. The Lagrange multiplier test (Chou & Bentler, 1990) indicated that the model could be best improved by correlating the error terms of peer attachment nonalienation and maternal attachment nonalienation. This single adjustment was theoretically justified on the grounds that people’s feelings of social acceptance or rejection might be pervasive across interpersonal interactions. The model was respecified by incorporating this single correlation, producing a final confirmatory model with higher fit indices (see Figure 1), $\chi^2(7) = 22.60$, $p < .001$, CFI = .99, NNFI = .98, SRMR = .03. Given that the original and modified models were nested, a chi-square difference test was performed, revealing that the updated analysis produced a significant improvement in fit, $\Delta\chi^2(1) = 66.75$, $p < .001$.

The final confirmatory factor analysis for attachment theory showed that the factor loadings, ranging from .58 to .99 ($p < .001$), significantly represented their respective factors (see Figure 1). Peer and maternal attachment were shown to be positively correlated, suggesting that young adults securely attached to their mothers also tended to be securely attached to their peers. To test whether the peer and maternal attachment factors might be better represented by a single latent factor of interpersonal attachment, we constrained their correlation to be perfect ($r = 1.00$). The imposition of this particular equality constraint was shown to be untenable, $p < .001$, and therefore released. The finding suggested that these two attachment factors, although correlated, were not isomorphic, thereby providing evidence of factor discriminant validity.

Confirmatory Factor Analysis of TPB Scale

The confirmatory factor analysis of TPB’s five factors produced an adequate model overall, $\chi^2(67) = 287.05$, $p < .001$, CFI = .94, NNFI = .92, SRMR = .06. Lagrange multiplier tests showed that the model could be statistically enhanced by correlating the error term between quantity and maximum drinks. This was justified on the basis that both indicators tapped level of alcohol consumption on drinking occasions. The final confirmatory factor analysis of TPB factors, incorporating this respecification, yielded higher fit indices (see Figure 2), $\chi^2(66) = 208.65$, $p < .001$, CFI = .96, NNFI = .95, SRMR = .05. A chi-square difference test between these two nested models found that the respecified model produced a significant improvement, $\Delta\chi^2(1) = 78.40$, $p < .001$.

Factor loadings, ranging from .65 to .98 (all $p < .001$), were significant indicators of their corresponding TPB latent factors (see Figure 2). Interfactor correlations ranged from .44 to .87, $p < .001$. Next, each possible interfactor correlation between the five factors in TPB was constrained, in separate tests, to be perfectly correlated ($r = 1.00$). None of the equality constraint impositions proved to be statistically tenable (all $ps < .01$), so all constraints were released. These tests showed that the five factors were empirically different constructs in TPB.

Predictive Model Integrating Attachment Theory and TPB

Factors from attachment theory and TPB were linked to develop a full structural equation model. The measurement component of the predictive model was specified in the same manner as the final confirmatory factor analyses of attachment theory (see Figure 1) and TPB (see Figure 2). To rule out alternative pathways, we estimated an initial model involving all potentially plausible direct paths. Although some paths are inconsistent with the TPB, this approach allows for a more rigorous evaluation of the model. The initial integrated model yielded satisfactory fit indices overall (see Figure 3), $\chi^2(147) = 333.73$, $p < .001$, CFI = .97, NNFI = .96, SRMR = .04. Next, to produce a more parsimonious model to describe the data, we deleted all nonsignificant paths and reestimated the model. Results of the final integrative model yielded desirable indices (see Figure 4), $\chi^2(155) = 344.00$, $p < .001$, CFI = .97, NNFI = .96, SRMR = .05. A chi-square difference test corroborated that trimming the nonsignificant paths did not significantly degrade the model, $\Delta\chi^2(8) = 10.27$, ns.

The measurement component of the final integrative model indicated that all factor loadings of their respective latent factors yielded reasonable magnitudes. A Pearson correlation test of the factor loadings obtained from two CFAs (see Figures 1 and 2) with the factor loadings obtained from the final predictive model (see Figure 4) revealed an almost perfect correlation of .99 ($N = 20$, $p < .001$). Thus, factor loadings of the final integrative model are not displayed because of redundancy in information with the CFAs.

The structural part of the trimmed model (see Figure 4) reveals that secure peer attachment positively predicted higher alcohol norms and behavioral control, whereas secure maternal attachment negatively predicted alcohol attitudes and behavioral control. Higher levels of alcohol attitudes, norms, and behavioral control positively predicted alcohol intentions. Finally, behavioral control and intentions uniquely explained alcohol use longitudinally. Two hypothesized paths were not significant: (a) peer attachment to attitudes and (b) maternal attachment to norms.

Indirect Effects

The final integrative model (see Figure 4) depicts mediational processes from exogenous factors (peer attachment and
maternal attachment) to a final endogenous outcome (T2 behavior). Thus, it was necessary to evaluate whether the proposed meditational processes were tenable. The decomposition of indirect and total effects for latent SEM models was then conducted (Sobel, 1987). Tests of indirect effects are presented in Table 1. For the sake of completeness, tests of indirect effects from intentions also were estimated and described first. Tests of indirect effects corroborated that secure peer attachment and insecure maternal attachment each indirectly predicted stronger alcohol intentions through the meditational factors of attitudes, norms, and behavioral control. Then, tests of indirect effects confirmed that secure peer attachment, insecure maternal attachment, pro-alcohol attitudes, pro-alcohol norms, and pro-alcohol behavioral control each indirectly predicted alcohol behavior at T2. Furthermore, all tests of total effects, defined as the combined direct and indirect effects on the endogenous factors, were found to be significant (see Table 1). These results supported the meditational processes depicted in the model (see Figure 4).

**Discussion**

In the current research, we investigated the interpersonal and intrapersonal factors associated with underage drinking in young adults using two major theoretical frameworks: attachment theory and TPB. On the basis of confirmatory factor analyses, results showed that measurement scales designed to capture constructs from these theories yielded reasonable psychometric properties. Using these factors for the main analyses, a structural equation model integrating both theories supported the majority of the hypothesized pathways. Secure peer attachment was related to young adults’ pro-alcohol normative perceptions and behavioral control. Even after we statistically controlled for peer attachment, secure maternal attachment negatively predicted attitudes and behavioral control toward alcohol. Secure maternal attachment had indirect, but not direct, effects on intentions and behavior, suggesting that the cultivation of parent–offspring bonds to reduce problematic alcohol behaviors might focus on persuasively influencing young adult alcohol beliefs rather than micromanaging their alcohol use. Furthermore, all of the TPB’s theoretical linkages were supported by the results.

Securely attached children might be more responsive to internalizing the conventional anti-risk-taking beliefs of their parents (Garnier & Stein, 2002). A positive parent–child bond imparts the view to the youth that the caregiver is committed to his or her well-being even in adulthood (Armsden & Greenberg, 1987). Formation of these perceptions might make college students more
resilient against attitudes and behavioral control favoring alcohol. Thus, developing this psychological resiliency may be manifested in the ability to delay gratification and manage the impulse to access alcohol (Grossmann et al., 2008; van der Kolk & Fisler, 1994). One study concerning resiliency in university students established that secure attachment to parents fostered healthy beliefs about separation and individuation, which, in turn, predicted three dimensions of positive transition to university: academic adjustment, social adjustment, and personal–emotional adjustment (Mattanah, Hancock, & Brand, 2004).

As found in the integrative model, peer attachment security predicted significantly higher normative beliefs favoring alcohol. Establishing closer peer attachment relationships might make young adults more vulnerable to alcohol-related peer pressure (Crawford & Novak, 2007; Robin & Johnson, 1996). The norms factor was measured with peer norm items to assess whether maternal attachment protected respondents against peer norms in support of alcohol, but this link was not found to be statistically significant. A practical implication is that attachment-based maternal efforts to manage university-aged children’s affiliation with

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**Figure 3.** Initial integrative model of attachment theory and theory of planned behavior (N = 351). Standardized coefficients are presented. For diagrammatic clarity, disturbance terms are not displayed, with disturbance terms correlated between attitudes and norms (r = .45), attitudes and behavioral control (r = .69), and norms and behavioral control (r = .45), all ps < .001. *p < .05. **p < .01. ***p < .001.

**Figure 4.** Final integrative model of attachment theory and theory of planned behavior (N = 351). D = Disturbance. Standardized coefficients are presented. Disturbance terms were correlated between attitudes and norms (r = .46), attitudes and behavioral control (r = .69), and norms and behavioral control (r = .46), all ps < .001. *p < .05. **p < .01. ***p < .001.
Indirect Effects and Total Effects From Predictors to Intention and Behavior in the Integrative Model (N = 351)

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<td>0.13</td>
<td>.10</td>
<td>3.13**</td>
</tr>
<tr>
<td>Maternal attachment</td>
<td>-0.11</td>
<td>-.10</td>
<td>-3.11**</td>
<td>-0.11</td>
<td>-.10</td>
<td>-3.11**</td>
</tr>
<tr>
<td>Attitudes</td>
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<td>.08</td>
<td>2.04</td>
<td>0.08</td>
<td>.08</td>
<td>2.04</td>
</tr>
<tr>
<td>Norms</td>
<td>0.26</td>
<td>.31</td>
<td>6.64***</td>
<td>0.26</td>
<td>.31</td>
<td>6.64***</td>
</tr>
<tr>
<td>Behavioral control</td>
<td>0.17</td>
<td>.35</td>
<td>6.76***</td>
<td>0.25</td>
<td>.51</td>
<td>8.25***</td>
</tr>
<tr>
<td>Intentions</td>
<td>0.36</td>
<td>.75</td>
<td>11.59***</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

*p < .05. **p < .01. ***p < .001.

high-risk friends and acquaintances may be futile, so other avenues might be pursued instead.

Of the three TPB beliefs, only behavioral control was explained by both peer attachment and maternal attachment. Peer attachment security was positively related to perceived behavioral ability to access alcohol, but maternal attachment security was negatively related to perceived behavioral ability to access this substance. Among the three belief factors, behavioral control was the strongest predictor of intentions, and it also predicted behavior at the 1-month follow-up. Despite it being an illegal substance for use among participants in this underage sample, the explanatory power of behavioral control is not unforeseen, considering that alcohol is a popular and ubiquitous beverage readily found in many situational contexts in the college culture (Chen, Gruenewald, & Remer, 2009; Komro, Maldonado-Molina, Tobler, Bonds, & Muller, 2007).

The path from intentions to T2 behavior produced the largest magnitude of effect. Although TPB’s intentions and behavior factors were empirically distinct in tests of constraints in the current project, as well as theoretically distinct as argued by the theory’s authors (Ajzen & Fishbein, 1980), a rationale for the strong connection is that the intentions construct most fully captures the immediate impetus to enact the behavior (Ajzen, 1991). Another explanation is that when responding to questions regarding alcohol intentions, participants recalled past alcohol behaviors to guide their intentions for reengaging in the behavior. One study found that although past behavior significantly correlated with intentions, the predictive connection of past behavior to intentions was no longer statistically significant once attitudes, norms, and behavioral control were set to predict intentions (S. E. Collins & Carey, 2007). Not all behavioral domains applying TPB have evidenced a strong intention–behavior link, as intention implementation requires self-regulation through the ability to inhibit an array of other impulses and behaviors competing for one’s attention (Ajzen, 2011).

A 1-month time lag was used in this research because it was thought that recall of past alcohol use via self-reports might become less accurate with the passage of more time. A meta-analysis of 206 TPB health studies containing a prospective design determined that the median length of follow-up in assessing behavior was 5 weeks (McEachan, Conner, Taylor, & Lawton, 2011). The intention–behavior link found in our study was larger than the typical magnitude documented in this quantitative review, which concluded that the strength of the intention–behavior link varies as a function of the type of behavior and the temporal interval between measurements. Various intervening factors and circumstances arising over the course of longer delay periods can modify the course of people’s intentions to implement a behavior (Ajzen, 2011).

The attachment factors were assessed at the same measurement period as the alcohol belief factors. The analyses were modeled to be logically consistent with attachment theory and much of the research in this area, as quality of attachment security was expected to foster development of an internal working model to guide beliefs and behaviors (Bowlby, 1969, 1988) rather than the other way around. Future researchers might consider expanding on our two-round approach by using more complex multiround designs to carefully scrutinize directional processes, for example, assessment of attachment variables prior to measurement of alcohol beliefs followed by the measurement of a behavioral outcome.

Participants in this study were young adults not old enough to legally drink in the United States. In most countries, the legal drinking age is around 18 years (McCatt, Hellinga, & Kirley, 2010). In a survey of university students from the United States and 20 European countries, including England, Germany, and France (Keller, Frye, Bauerle, & Turner, 2009), higher legal drinking age positively correlated with prevalence of binge drinking. That is, in countries where alcohol is restricted to older individuals, university students were prone to heavier drinking, suggesting that underage respondents might consume at riskier levels when alcohol is contraband. Causality should not be implied, as unidentified cultural differences might confound this connection. A distinction that sets the United States apart is that it has a relatively pronounced driving culture, thus raising the possibility of serious harm involving a vehicle (Wechsler & Nelson, 2008). In any country, whether underage individuals consume alcohol may be
due in part to whether they believe the minimum age requirement is legitimate. The perceived illegitimacy of an alcohol control policy corresponds to elevated drinking levels in reactance to perceived restrictions and infringements on personal liberties, as research shows that youth who felt that alcohol laws were unjust were more likely to use the substance (Amonini & Donovan, 2006).

Limitations

Results presented in this study should be interpreted in light of potential limitations. The current research focused exclusively on underage drinking in a young adult sample, without distinguishing participants in terms of clinical forms of drinking—such as alcohol abuse and addiction—which necessitates categorizing participants on the basis of a checklist of disorders assessed from the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; American Psychiatric Association, 2000). Our goal in the current research was to focus on modeling levels of alcohol consumption typical among underage adult drinkers, with an eye toward isolating developmental and belief factors for prevention efforts.

A methodological limitation is the use of self-report measures, a modality of administration susceptible to the threat of socially desirable responding (Crano & Brewer, 2002). Given that alcohol use is relatively normative behavior among college students and the precautions of confidentiality afforded in the Web-based survey, such biases are likely small. Research applying the TPB has been conducted predominantly using self-report measures, but future research should assess its constructs in observational and field-based designs. As college students are returning from a party, blood alcohol concentration might be measured via breathalyzer tests that serve as a physiological indicator of alcohol use (Grant, LaBrie, Hummer, & Lac, 2012), but this instrument is not without problems, as it only gauges the concentration of alcohol remaining in the blood at the moment of assessment. Although the study provided information on types of beverages containing alcohol, the amount of alcohol constituting a standard drink was not defined to participants. It was possible that a person who poured a generous glass of vodka might have judged this to be a single serving. Given the different types of alcohol beverages, each varying in percentage of ethanol, conversion information might be confusing to participants. Experimental research shows that people have difficulty in accurately pouring the amount of alcohol even when information about a standard drink is provided (Dawson, 2011). Furthermore, college students’ knowledge of the ethanol content of beverages is unrelated to accuracy in the pouring task (De Visser & Birch, 2012). Part of people’s poor ability to gauge a standard drink unit is that no universal standard exists. In the United States, a standard drink size contains about 14 g of ethanol, but in a comparable country such as the United Kingdom, it is only 8 g (Dawson, 2011).

Other potential factors explicating underage drinking were unmeasured and therefore not incorporated into the model. Past alcohol use might be responsible for driving the belief factors of attitudes, norms, and behavioral control. Additional research should determine whether peer and maternal attachment explicates each of the alcohol belief factors beyond past behavior. Another extension might require underage drinkers to indicate the extent to which they believe that alcohol laws and policies are unjust, to determine whether this particular variable might be directly or indirectly responsible for alcohol use. Incorporating these measures, however, might have expanded the results observed in the present analyses, but it is unlikely that they would have contradicted them.

Conclusions

The NIAAA (2006, 2009) recommended that future preventive research should strive to examine underage drinking in terms of how developmental forces, such as peer relationships and family dynamics, serve as risk and resilient factors. The present project is a response to this call to action by examining both types of interpersonal relationships in a multivariate framework. Consistent with the findings presented here and the NIAAA’s recommendation, parents could be trained to adopt protective parenting practices that are part and parcel of the parental attachment construct, such as engaging in familial activities that cultivate trust, encouraging bidirectional parent–child communication, and adopting disciplinary practices that reject delinquent behaviors yet foster unconditional acceptance of the youth.

Results from the current research demonstrate that maternal bonds continue to play a protective role in the lives of young adults, even after controlling for peer bonds. It is noteworthy that the attachment constructs were measured entirely with respect to attachment theory conceptualizations, as none of the attachment items were phrased in terms of peer or maternal beliefs regarding alcohol use. The predictive utility of attachment bonds is underscored by the fact that these broadly defined interpersonal constructs were shown to explain significant variance in a restricted behavioral domain. A major implication of this point is that secure attachment bonds to mothers could potentially serve as a defense against an array of other forms of risk beliefs and problematic behaviors in young adulthood. Results obtained from this research offer theoretical and practical information regarding the processes leading to underage drinking.

References


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