



Moderating effects of positive parenting and maternal alcohol use on emerging adults' alcohol use: Does living at home matter?



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HIGHLIGHTS

- Maternal parenting behaviors were associated with emerging adults' alcohol use.
- Effect of mothers' own drinking was significant only among male participants.
- 3-way interaction of mothers' drinking X warmth X living arrangements for females.
- Strongest effects among females who lived with family and had low closeness.

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ABSTRACT

Positive parenting behaviors and parental modeling of alcohol use are consistent predictors of offspring's alcohol use. Recent research extends these findings to emerging adult children and confirms continued parental influence beyond adolescence. This paper examines how maternal warmth and supervision moderate the effects of mother's heavy alcohol use on their offspring's alcohol use among a sample of non-college-attending emerging adults. Three-way interactions were used to examine if these moderating effects differed between emerging adults who lived at home and those with other living arrangements. Separate analyses within gender were used to further examine these associations. Participants were 245 emerging adults between ages 18 and 22 years with no post-secondary education (59% female) who were selected from a national probability-based internet panel. Path analyses indicated that, regardless of living arrangements, male emerging adults who were more likely to witness their mother getting drunk were themselves more likely to engage in risky drinking. However, among female emerging adults, similarity between mothers' and daughters' drunkenness was strongest among participants who resided with their family and also reported low levels of maternal warmth. This study extends previous research by indicating that the effects of maternal modeling of heavy alcohol use on emerging adults' heavy alcohol use depend upon several factors, including the gender of the child and the family context. Implications of the study findings are discussed in terms of expanding the scope of a parent-based intervention (PBI) to all emerging adults, including those who do not attend colleges or universities.

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1. Introduction

The transition from adolescence to adulthood in modern U.S. society has been recognized as a distinct stage of life, referred to as "emerging adulthood" (Arnett, 2000). A notable characteristic of this transitional phase (generally between ages 18 and 25) is an increase in risk behaviors, particularly alcohol use. For example, rates of both current (e.g., 30-day) alcohol use and risky alcohol use, such as heavy episodic drinking (HED), are highest in this age group (Johnston, O'Malley, Bachman, &

Schulenberg, 2012). Consequently, relative to other age groups, emerging adults are at highest risk for experiencing alcohol-related problems, including accidental injury and sexual violence (Hingson, Zha, & Weitzman, 2009).

The experience of emerging adulthood among U.S. youth is not universal, however. For most individuals with middle and higher SES backgrounds, navigating this stage of life begins with a college or university education. However, less than half of all high school seniors enroll the following fall semester as full-time students at 4-year institutions and only about one-quarter enroll at 2-year institutions (Aud et al., 2011). Further, at least one-fifth of U.S. students do not complete high school, with highest dropout rates observed among minority youth and those from lower SES backgrounds (Heckman & Lafontaine, 2010). Although longitudinal studies indicate that such non-college-bound (NCB)

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youth are at higher risk for developing alcohol-related problems later in life, compared to their college-attending peers (Muthén & Muthén, 2000; White, Labouvie, & Papadaratsakis, 2005), prevention efforts have focused primarily on reducing high-risk drinking among college students (Larimer & Cronce, 2007; White et al., 2005). Etiological research that examines risk and protective factors associated with alcohol use among NCB emerging adults is thus essential (Spath, Greenberg, & Turrissi, 2008). The present study focuses on risk and protective factors within the family environment as predictors of emerging adults' heavy alcohol use.

1.1. The role of parents in predicting emerging adults' alcohol use

Risk factors within the family environment can be described as either alcohol-specific or non-alcohol-specific parental influences (Jacob & Johnson, 1997). *Alcohol-specific* influences include the impact of the parents' own alcohol use as well as genetic risk factors on children's drinking behaviors. As described in Social Learning Theory (Bandura, 1986), the effects of parental alcohol use likely occur through children's direct observation of this use as well as the transmission of values and norms regarding alcohol use (White, Johnson, & Buyske, 2000). Many studies indicate that parental alcohol use is a strong predictor of their adolescent offspring's use of alcohol (Chassin, Curran, Hussong, & Colder, 1996; Ellickson, Tucker, Klein, & McGuigan, 2001; Latendresse et al., 2008; Wills, McNamara, Vaccaro, & Hirky, 1996) and recent research has extended these findings to emerging adult offspring, including both college student (Abar, Abar, & Turrissi, 2009) and community (Casswell, Pledger, & Pratap, 2002; Chassin, Pitts, & Prost, 2002; Englund, Egeland, Oliva, & Collins, 2008; White et al., 2000) samples.

Parents also influence their offspring's alcohol use through *non-alcohol-specific* behaviors, which can be defined as more general features of the family environment. Several decades of research yield consistent evidence that children fare best when raised in positive family environments that are characterized by (1) warm and supportive relationships and (2) appropriate supervision and monitoring strategies (Steinberg, 2001). According to Social Control Theory (Hirschi, 1969), children raised by parents who use these positive parenting behaviors are more likely to develop close bonds to their parents and thereby are more likely to adopt pro-social norms and values. These social bonds attenuate the offspring's tendency toward risky behaviors, such as alcohol use. Recent research indicates that positive parenting behaviors are protective against high-risk drinking during emerging adulthood in college student samples (Abar & Turrissi, 2008; Mallett et al., 2011; Varvil-Weld, Mallett, Turrissi, & Abar, 2012; Walls, Fairlie, & Wood, 2009). A few studies using community samples have also confirmed protective effects of positive parenting behaviors among emerging adults who do not attend college (e.g., White et al., 2000, 2006).

1.1.1. Moderating effects of parental influences

Despite this large literature, a number of questions regarding parental influences on emerging adults' alcohol use remain unanswered. Foremost, relatively few studies have examined how parents' non-alcohol-specific and alcohol-specific behaviors may interact to either protect against or increase the risk of their offspring's alcohol use. Tenets of both Social Learning Theory and Social Control Theory posit that modeling of heavy drinking parents may be contingent upon the quality of the parent–child relationship (Jung, 1995). However, the two theories offer competing hypotheses regarding the nature of this moderation and whether a high quality parent–child relationship increases or decreases the likelihood that the child will imitate the drinking behaviors of their parent.

Social Learning Theory suggests that close bonds between parents and their children may increase the risk associated with parental alcohol use, as the child is more likely to adopt behaviors of individuals (i.e., parents) with whom they are closely attached (Bandura, 1986). Thus, parent–child concordance in drinking behaviors is more likely

when the offspring values the parent, as evidenced by a close parent–child relationship. Moreover, alcohol-using parents in such situations may be more likely to encourage and reinforce their offspring's use of alcohol if they feel they have a good relationship with their child (Andrews, Hops, & Duncan, 1997). This scenario seems more likely as the offspring approaches the legal drinking age of 21 years. Thus, a close relationship with a parent should *exacerbate* the risk associated with parental alcohol use on offspring's alcohol use. On the other hand, if the parent–child relation is hostile, the child may actively reject their parent's values. At the extremes, this could present as a child of a heavy drinking parent choosing to remain abstinent, or vice versa, the child of an abstinent parent choosing to become a heavy drinker.

In contrast, Social Control Theory proposes that a child's close relationship with his or her parent leads to the adoption of conventional social values, thereby reducing the likelihood that an underage child would drink alcohol. In situations where parents' behaviors are incongruous with these values, such as when parents who drink heavily discourage their child from drinking, it may be that a close relationship allows children to adopt the parents' values rather than their behavior. In essence, the offspring “do as the parents say, not as they do” (Urberg, Goldstein, & Toro, 2005). This pattern of results suggests that positive parenting behaviors (i.e., close relationships and appropriate supervision) can counter the effects of parental alcohol use, resulting in a *buffering* (i.e., protective) effect.

Previous research provides inconsistent evidence regarding how the family environment may moderate the modeling of problem drinking. Several studies indicate that a positive family environment, characterized by warm parent–child relations and strong parental supervision, can counter the negative effects of parental alcohol use on offspring's alcohol use (Andrews et al., 1997; Ennett et al., 2008; Farrell, Barnes, & Banerjee, 1995; Kuendig & Kuntsche, 2006; Zhang, Welte, & Wiczorek, 1999). These findings support the assumptions of Social Control Theory. However, other research has indicated that parent–child drinking behaviors were similar only when the parent–child association was close (Andrews et al., 1997; Cooper, Peirce, & Tidwell, 1995; Jung, 1995), consistent with Social Learning Theory.

1.1.2. Limitations and gaps in previous research

Such discrepant conclusions may be due to several methodological differences among the studies that have examined moderation effects of parental influences. For example, past studies have used several different operational definitions of parental alcohol use. Most of this research focuses on children of alcoholics (COA) and defines parental alcohol use as abuse or dependence (e.g., Cooper et al., 1995; Pearson, D'Lima, & Kelley, 2012) or relies on dichotomous measures of parental drinking (e.g., Andrews et al., 1997; Farrell et al., 1995; Kuendig & Kuntsche, 2006). There has been less emphasis on examining the continuum along which parental alcohol use exists (for exceptions, see Jung, 1995; Urberg et al., 2005; White et al., 2000; Zhang et al., 1999). Further, only one study (Ennett et al., 2008) has examined the role of parental supervision; all other past studies defined positive parenting behaviors by warm relationships alone.

Different conclusions may also be due to other moderating variables, such as the age and gender of the child, as well as which parent (mother or father) served as the modeling or bonding source (Andrews et al., 1997; Coffelt et al., 2006; Cooper et al., 1995; Pearson et al., 2012). For example, Andrews et al. (1997) found that adolescents were more likely to model the alcohol use of their fathers if they had a good relationship with him but significant interactions were not found for the effects of mothers' alcohol use. In contrast, Zhang et al. (1999) examined moderating results among a sample of adolescent males (ages 16–19) and found significant interaction effects only among mothers' behaviors: adolescent drinking was related to mothers' drinking only when male adolescents reported low levels of closeness to their mother.

Only a few studies have examined offspring gender as a moderator of these associations, however. Andrews et al. (1997) found that

mothers' alcohol use was significantly related to offspring use only among younger girls (less than age 14) and older boys (greater than age 14); it was not related to alcohol use among younger boys or older girls. However, a positive mother–child relationship was inversely related to alcohol use among adolescent girls, but not among boys. In contrast, among college students, Jung (1995) reported a significant concordance between drinking of sons with drinking of each parent. Although drinking levels of female students were not related to either parent's drinking, modeling of mothers' drinking was more likely if the female student reported a close relationship with her mother. Similar results were reported by Cooper et al. (1995) who found that mothers' history of alcohol-related problems were significantly related to alcohol use among adolescent males but was not related to use among female adolescents.

Importantly, a majority of studies examine positive parenting behaviors directed toward adolescent offspring. We could not identify any prior studies that examined the effects of positive parenting behaviors, administered during emerging adulthood, or concurrent measures of parent alcohol use on NCB youth alcohol use (Stone, Becker, Huber, & Catalano, 2012). Rather, the limited number of studies that have examined these relations among emerging adults and their parents are limited to samples of college students (Jung, 1995; Pearson et al., 2012) or, in community samples, focus on prospective effects of parenting behaviors exhibited during adolescence on emerging adults' alcohol use (White et al., 2000, 2006). Jung (1995) reported that college students' drinking behaviors were most similar to their parents' drinking habits only in families with close bonds; in families that did not have close bonds, there was a negative relationship between parent and child alcohol use. Findings reported by Pearson et al. (2012), however, suggest an opposite conclusion. Defining parent modeling along four dimensions of ACOA status (mother, father, both parents, or neither parent), the positive relation between maternal ACOA status and offspring's alcohol use outcomes was weaker among students with strong attachment to their mother for one of the two measures of parental relationship. White et al. (2000) found no evidence of moderation.

Finally, although living arrangements are important factors in emerging adults' alcohol use (White et al., 2006), no studies to date have examined how the moderating effects of parent drinking and parent–child relationship may differ depending on whether or not the emerging adult offspring continues to reside in their childhood home or not. Rather, most previous research has focused on identifying differences between college-bound (CB) and NCB youth, suggesting that college students who move away from their family homes into dormitories or other peer-inhabited living situations increase their heavy drinking (Baer et al., 1995; Harford et al., 2002; White et al., 2006). For example, Bachman and colleagues (1997) found that increases in alcohol and marijuana use for college students were attributed to living with similar-aged peers. While their high school drinking was lower than that of their NCB peers, after moving away from home and into same-aged peer living situations, their use increased to levels higher than their NCB peers. Explaining these results, White et al. (2006) suggest that CB youth who go to college but continue to live with parents are protected from the high-risk environments of living with same-aged peers, and therefore maintain stability in alcohol use from high school to college. This stability results in lower levels of drinking compared to their CB peers who make the transition to living with same-aged peers. Very little research, however, has focused on differences between living arrangements among NCB youth, particularly those with no post-secondary education (see White et al., 2006 for an exception).

1.2. The current study

The current research was designed to address these gaps using a sample of NCB emerging adults with no more than a high school education. Three primary aims guided the study. The first aim examined the main effects of positive parenting behaviors (i.e., provision of warmth

and supervision) and parental heavy alcohol use on offspring's heavy drinking. Focusing only on maternal behaviors, we hypothesized that higher levels of mothers' warmth and supervision would be associated with decreased risk of offspring heavy drinking, whereas mothers' heavy alcohol use would be positively associated with their emerging adult child's heavy drinking.

The second aim investigated the possibility that mothers' warmth and supervision moderated the effect of their own heavy drinking use on their offspring's heavy drinking. As summarized above, previous research suggests two competing hypotheses concerning the direction of this interaction. On one hand, several studies suggest that a close relationship with a parent offers a *buffering* effect by countering the risk associated with parental alcohol use on offspring use. On the other hand, other studies suggest that offspring are more likely to imitate a parent's behavior if they feel close to that parent. In this situation, a close relationship *exacerbates* the risk associated with parental alcohol use. Most of this literature focuses on parent–child relations using adolescent samples; we identified only two studies of emerging adults (college students) that produced conflicting results. Because we operationalized maternal drinking along a continuum, similar to Jung (1995) rather than distinguishing between non-COA and COA statuses (as Pearson et al., 2012 did), we hypothesized that participants' drinking behaviors would be most strongly related to their mothers' drinking behavior within the context of close maternal bonds.

The third aim investigated how these associations varied across different living arrangements of the emerging adult offspring. We hypothesized that all associations would be strongest among participants who currently resided with their childhood family, compared to participants who did not currently live with their family. Specifically, we expected to find support for the exacerbating effect of positive parenting on mothers' alcohol use only among participants living with their childhood family.

Because past research has produced conflicting results regarding gender differences in these relations, we conducted all analyses were first conducted among the full sample and then repeated separately for male and female emerging adults. Because this was an exploratory aim, we had no hypothesis about whether the three-way interaction would be stronger for men or women.

2. Materials and methods

2.1. Participants

Participants were recruited from a predetermined Internet panel (Knowledge Panel®, KP) designed to be representative of the general population of the United States and maintained by the consumer information company Knowledge Networks. KP members are randomly recruited through probability-based sampling of addresses from the U.S. Postal Service's Delivery Sequence File, which covers approximately 97% of U.S. households. The selected households are provided access to the Internet and hardware if needed. KP recruitment uses dual sampling frames that include both listed and unlisted telephone numbers, telephone and non-telephone households, cell-phone-only households, and households with and without Internet access. Only persons sampled through these probability-based techniques are eligible to participate (Chang & Krosnick, 2009).

Upon entry, members of KP completed a profile survey of demographic information. Based on information provided in the profile survey, it was determined that 1631 KP members met initial eligibility criteria (age 18 to 22, not enrolled in high school, and no more than a high school education). In the fall of 2011, these eligible panelists received an email invitation from Knowledge Networks that described the study and included a link to an online screening survey, which included criteria to only select panelists who had received no post-secondary training of any type (e.g., technical or trade school). Of those contacted, 666 consented to participate and completed the

screening items, yielding a study completion rate of 41%; a number consistent with web-based recruitment (Larimer et al., 2007). Preliminary analyses revealed the responders ($N = 666$) were more likely to have completed high school and to be married, divorced, or separated (relative to living with a romantic partner), whereas non-responders ($N = 965$) were more likely to be unemployed and report non-White ethnic status.

Of those who completed the screening survey, 264 (40%) were confirmed as non-students and completed the anonymous, web-based survey. Included in the survey was an item that asked, "What is your relationship to the person in your life that has been most like a mother to you?" A total of 16 participants either reported having no mother figure in their life ($N = 15$) or refused to answer the question ($N = 1$), and 19 participants did not report perceptions of their mother's alcohol use. These participants were excluded from the present study, resulting in a final sample of 245 participants (59% female; mean age = 20.64 years, $SD = 1.28$). Among these, 94% of the mother figures were biological mothers. Slightly more than half (59%) of the sample identified themselves as White, Non-Hispanic, 10% identified as Black, Non-Hispanic, and 21% identified as Hispanic. The majority of the sample had earned either a high school diploma (62%) or equivalency (i.e., GED; 17%) whereas 20% reported less than a high school education. On average, panelists completed the survey within 18 min and were compensated via a "point" system administered by Knowledge Networks.

2.2. Measures

2.2.1. Emerging adults' alcohol use

Heavy drinking was assessed using a single item adapted from the Quantity, Frequency, Peak (QFP) scale (Dimeff, Baer, Kivlahan, & Marlatt, 1999). Participants indicated how many times, in the past 30 days, they had been drunk or very high from alcohol. Participants reported the number of times they had been drunk or very high from drinking alcohol in the past month (*Frequency of Drunkenness*), assessed on a 6-point Likert scale, from 1 = *Never* to 6 = *9 or more times*.¹ Participants who reported that they did not currently drink alcohol were given a score of "0."

2.2.2. Maternal alcohol use

Participants also reported their perceptions about their mothers' drunkenness use using the stem, "In the past year, how often did you see your mother drunk or very high from alcohol?" Response options ranged from 1 = *never* to 6 = *9 or more times*.

2.2.3. Maternal parenting behaviors

Participants' perceptions of their mothers' parenting behaviors were assessed with two scale indices. Four items adapted from Abar (2012) assessed *maternal warmth* ($\alpha = 0.93$). These included: (1) I go to my mother for help when I need advice about something important; (2) My mother is honest with me; (3) I can trust my mother when we talk; and (4) Overall, I am satisfied with the way my mother and I communicate. Maternal supervision was assessed with two items originally adapted by Wood, Read, Mitchell, and Brand (2004) from the Strictness-Supervision scale (Steinberg, Lamborn, Dornbusch, & Darling, 1992) to reflect items relevant for older adolescents: (1) My mother tries to know where I go at night; and (2) My mother tries to know about my drinking ($r = 0.78$). All items utilized response categories ranging from 1 = *strongly disagree* to 5 = *strongly agree*; thus, higher scores indicate greater maternal warmth and supervision.

¹ Additional analyses (not shown) were conducted using drinks per week as the outcome. Results were similar in magnitude and direction to the present findings and are available from the first author upon request.

2.2.4. Living arrangements

Demographic profiles for KP participants included an item concerning their current living arrangements. Six options were available, including: (1) *alone*; (2) *with my childhood family*; (3) *with other relatives*; (4) *with friends [unrelated]*, (5) *with a romantic partner*; (6) *group quarters [e.g., dorm, military]* and (7) *have no regular place to stay*. From these responses, a dichotomous variable was created to contrast those living with their childhood family (1) to all other participants (0).

2.2.5. Demographic variables

All analyses included control variables derived from the demographic profiles provided by KN. These included the participants' age (continuous variable, measured in years), sex (0 = male; 1 = female), and race/ethnicity (0 = nonwhite; 1 = white). Gross income of the participants' household, measured by 19 categories ranging from *Less than \$5000* to *\$175,000 or more*, was used as a proxy for participants' SES (continuous item, mean = 7.79, $SD = 4.29$). Both age and income were standardized prior to model entry.

2.3. Analysis plan

A sample base weight was computed from the demographic profile data provided by participants upon entry to account for known sources of deviation from an equal probability of selection design. Demographic and geographic distributions for the non-institutionalized, civilian U.S. population ages 18 and older from the August 2011 Current Population Survey (CPS) were used as benchmarks for this adjustment. Using the base weight described above, comparable distributions were calculated by using all completed cases from the field data, including eligible and non-eligible panelists. The post-stratified and trimmed weights were then scaled to fit the total sample size of the qualified respondents.

Path analysis was used to examine relations among mothers' positive parenting behaviors, mothers' drunkenness, and NCB emerging adults' risky alcohol use, using the Mplus software (Muthén & Muthén, 1998–2011). We specified two series of fully saturated path models. In the first model, the main effects of both mothers' positive parenting behaviors (warmth and supervision) and drunkenness were included as independent variables to test Hypothesis 1 (Model 1). Two separate sets of models were then specified to examine unique interaction effects associated with each of the two positive parenting behaviors. In the second model, an interaction term was created by multiplying the specific parenting term (warmth or supervision) with mothers' drunkenness and added to the model to test the hypothesis that each positive parenting behavior moderated effects of mothers' drunkenness (Hypothesis 2; Models 2a and 2b). This model also included two-way interaction terms for living arrangement group by mothers' drunkenness and living arrangement group by the specific parenting behavior. The third model tested the hypothesis that moderation effects would be found only among participants who currently resided with their childhood family (Hypothesis 3; Models 3a and 3b). In this model, a three-way interaction term was added that specified the specific parenting behavior (warmth or supervision) by mothers' drunkenness by living arrangement group. The above analyses were first conducted using the full sample and then repeated separately for female and male emerging adults.

Variables involving positive parenting behaviors and mothers' drunkenness were unstandardized to facilitate assessment of significant interaction effects and completely unstandardized results are reported (Preacher, 2010–2013). We used an alpha level of .05 for all statistical tests and computed Cohen's f^2 as a measure of effect size for models to compare models with and without interaction effects. This test measured the improvement in model fit that was attained by adding the interaction terms to the regression model that included only the main effects. By convention, f^2 values of 0.02, 0.15, and 0.35 refer to small, medium, and large effect sizes, respectively (Cohen, 1992). Following procedures outlined in Preacher, Curran, and Bauer (2006), we evaluated interaction

effects by obtaining significance tests for simple slopes across high and low scores of the moderating variables (e.g., maternal warmth = 1 and 5) using estimated parameters and the associated covariance matrix. These computations were conducted via online tools provided by Preacher et al. (2006) at <http://www.quantpsy.org>. Three control variables were included in all models (race/ethnicity, age, and SES). Participant gender was included as an additional control in the full sample models. To account for non-normality of the outcome variables and sampling weights, maximum likelihood estimation with robust standard errors (MLR) was used in all analyses. Preliminary analyses indicated that missing responses were minimal (<1% on any variable) and were addressed using Full Information Maximum Likelihood (FIML), the default missing data method applied by Mplus (Muthén & Muthén, 1998–2011).

3. Results

3.1. Descriptive statistics and correlations

Table 1 presents the inter-item correlations among the study variables, separately by living arrangement group and gender. Among females living with their childhood family (top panel, above the diagonal), mothers' supervision was negatively related to participants' age and positively correlated with maternal warmth (both $ps < 0.05$). Within this group, mothers' drunkenness was negatively correlated with both maternal warmth and maternal supervision (both $ps < 0.05$). Examining the correlations among females not living with family (top panel, below the diagonal) revealed that maternal warmth was positively correlated with maternal supervision ($r = 0.34, p < 0.05$) and negatively correlated with participants' drunkenness ($r = -0.49, p < 0.01$). In addition, mother's drunkenness was positively correlated with daughters' drunkenness ($r = 0.55, p < 0.001$) among females not living with their family.

Among males living with their childhood family (bottom panel, above the diagonal), mothers' drunkenness was negatively correlated with maternal supervision ($r = -0.38, p < 0.01$) and positively correlated with the sons' drunkenness ($r = 0.40, p < 0.01$). Among males not living with their childhood family (bottom panel, below the diagonal), maternal warmth was positively correlated with both parental income and maternal supervision (both $ps < 0.05$).

A comparison of measures across the two living arrangement groups (Table 2) indicated that female, compared to male, NCB emerging adults

were less likely to live with their childhood family ($\chi^2 [1, N = 245] = 11.29, p < 0.001$). Participants living with their childhood family were younger than their counterparts ($t = 2.24, p < 0.05$) and also reported higher levels of maternal warmth and supervision (both $ps < 0.05$). Comparison of means across gender revealed two significant differences. Male participants reported higher parental income ($t = 2.01, p < 0.05$) as well as higher rates of drunkenness ($t = 2.15, p < 0.05$) than female participants.

3.2. Results of path analysis models

3.2.1. Full sample

Results of the path analysis models among the full sample are presented in Table 3. Results for Model 1 indicated that emerging adults who reported higher levels of mothers' drunkenness reported greater frequency of drunkenness themselves ($b = 0.32, p < 0.01$), whereas maternal warmth and supervision were not associated with emerging adults' alcohol use. Subsequent models indicated that neither of the two-way interactions involving mothers' drunkenness and positive parenting behaviors were significant predictors of emerging adults' drinking (Models 2a and 2b) nor were the three-way interactions involving mothers' warmth or supervision (Models 3a and 3b).

3.2.2. Female participants

Table 4 presents results of models predicting frequency of drunkenness among the female participants. Results for Model 1 indicated that living arrangements had a significant main effect on emerging adults' heavy drinking. Female emerging adults who resided with their family of origin, compared to those who did not, reported lower rates of heavy drinking ($b = -0.76, p < 0.001$). No other main effects were found for females. Model 2a indicated a significant two-way interaction between living arrangement by mothers' drunkenness ($b = 0.50, p < 0.05$). However, this interaction was qualified by the significant three-way interaction involving maternal warmth found in Model 2b ($b = -0.26, p < 0.01$), indicating that relations among mothers' drunkenness, emerging adults' living arrangements, and emerging adults' drunkenness were moderated by the mothers' warmth. This model accounted for 34% of the variance in female emerging adults' drunkenness, a proportional increase of 0.06 (Cohen's $f^2: 0.34-0.30/1-0.25 = 0.06$) relative to Model 1, the main effects-only model. The two- and three-way interactions with supervision were not significant (Models 3a and 3b).

To probe the three-way interaction for maternal warmth, we computed simple intercepts and simple slopes for the regression of female emerging adults' drunkenness on mothers' drunkenness at low and high values of mothers' warmth for each of the two living arrangement groups (with family of origin, not with family of origin). These plots are displayed in Fig. 1. This analysis indicated that the simple slope of mothers' drunkenness on emerging adults' drunkenness was significant only among female participants who reported low levels of maternal warmth and living with their family of origin ($b = 1.05, p < 0.001$); the relation of mothers' drunkenness to daughters' drunkenness was not significant for the other three groups (all $ps > 0.40$). Thus, the positive association between mothers' drunkenness and female participants' frequency of drunkenness was strongest among those who reported lowest levels of maternal warmth and lived at home.

3.2.3. Male participants

The results of models predicting male emerging adults' frequency of drunkenness are presented in Table 5. Among this group, there was a positive association between mothers' drunkenness and emerging adult sons' drunkenness ($b = 0.45, p < 0.001$). No other main effects or interaction effects were found for male participants.

Table 1

Inter-item correlations, by living arrangement group and gender.

	Age	Income	Warmth	Super	Mom drunk	EA drunk
<i>Females</i>						
Age	–	–0.11	0.09	–0.24*	0.08	0.19
Income	0.40*	–	0.06	0.02	–0.14	–0.06
Warmth	0.15	0.21	–	0.35***	–0.21*	0.05
Super	–0.02	0.02	0.34*	–	–0.22*	–0.02
Mom drunk	–0.06	–0.09	–0.19	–0.15	–	0.06
EA drunk	0.03	0.03	–0.49***	–0.10	0.55***	–
<i>Males</i>						
Age	–	–0.04	–0.19	–0.11	–0.04	0.10
Income	–0.14	–	–0.09	–0.07	0.00	–0.12
Warmth	0.09	0.29*	–	0.18	–0.11	0.08
Super	0.00	0.20	0.53***	–	–0.38**	–0.17
Mom drunk	0.19	–0.06	0.20	0.03	–	0.40**
EA drunk	0.20	0.00	–0.06	–0.12	0.23	–

Note: coefficients above the diagonal refer to participants who live with childhood FAMILY; coefficients below the diagonal refer to participants who live with OTHERS. Super = Supervision; Mom Drunk = Mother's Frequency of Drunkenness; EA Drunk = Emerging Adults' Frequency of Drunkenness.

* $p < 0.05$.
 ** $p < 0.01$.
 *** $p < 0.001$.

Table 2
Descriptive statistics and comparison across living arrangement groups and gender.

	With family (N = 85)		With others (N = 160)		t-Value	Females (N = 145)		Males (N = 100)		t-Value
	Mean	SD	Mean	SD		Mean	SD	Mean	SD	
Percent female	44.71%	–	68.88%	–	11.29***	–	–	–	–	–
Percent living family	–	–	–	–	–	44.71%	–	55.29%	–	11.29***
Age	20.39	1.24	20.77	1.28	2.24*	20.69	1.25	20.56	1.32	0.78
Income	1.94	0.99	1.77	1.01	1.25	1.72	0.98	1.98	1.03	2.01*
Mothers' warmth	4.06	1.07	3.71	1.17	2.25*	3.83	1.16	3.84	1.12	0.03
Mothers' supervision	3.77	1.14	2.97	1.36	4.62***	3.14	1.35	3.41	1.32	1.57
Mothers' drunkenness	1.48	1.26	1.72	1.35	1.33	1.64	1.29	1.63	1.38	0.07
EA drunkenness	1.42	1.41	1.48	1.23	0.30	1.31	1.06	1.67	1.56	2.15*

Note: SD = Standard Deviation; Test Value for Percent Female and Percent Living Home = χ^2 Goodness-of-fit ($df = 1$), all other tests are t-tests of independent groups.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

4. Discussion

4.1. Summary of results and hypothesis tests

This study examined associations among NCB emerging adults' perceptions of their mothers' positive parenting behaviors and drunkenness, and their own risky alcohol use. Using data from a sample of emerging adults with no post-secondary education, three study aims were addressed. The results from the first set of path analytic models, examining main and interaction effects among the full sample, partially supported the first hypothesis. Mothers' drunkenness was positively related to her emerging adult offspring's drinking behavior. Subsequent models, however, revealed that this association was significant only among male participants, whereas emerging adults' living arrangement was a significant predictor only for female EAs' drunkenness. Within the full sample, there was also some evidence that mothers' supervision was negatively associated with her offspring's drunkenness (e.g., $p = 0.07$ in the main effects model). Contrary to expectations, maternal warmth did not have significant main effects on emerging adults' drunkenness in any of the models.

The second aim examined the extent to which positive parenting behaviors moderated the link between mothers' drunkenness and her offspring's drunkenness. We expected to find that NCB emerging adults' heavy drinking would be most strongly related to their mothers' drunkenness when the participants reported higher levels of positive family environments, defined by a warm relationship with their mother and higher rates of maternal supervision of their activities. However, we did not find evidence of significant two-way interactions for either

positive parenting behavior among the full sample or either of the two gender groups. Thus, the second hypothesis was not supported.

The third aim examined the impact of the emerging adults' current living arrangements on these associations and we hypothesized that these associations would be strongest among emerging adults who lived with their family of origin. Partial support for this hypothesis was found only among the female participants. Among females, the three-way interaction of maternal warmth, maternal drunkenness, and participants' living arrangements was significant. Plotting this interaction revealed that the positive association between mothers' drunkenness and her daughter's drunkenness was strongest among female participants who resided with their childhood family and reported lowest levels of maternal warmth. Simple slopes analysis confirmed this conclusion. This pattern of moderation was not consistent with our hypothesis that NCB emerging adults' would be more likely to imitate their mothers' drinking behaviors when they reported a more positive family environment. Rather, these results indicate that it was the *lack of a warm relationship* between mothers and daughters that exacerbated the negative effects of maternal alcohol use on offspring's alcohol use. Thus, in the current study, concordance between mother's and daughter's heavy drinking was found only among female emerging adults who did not have a close relationship with their mother (i.e., perceived their mothers as dishonest or not trustworthy, did not go to her for helpful advice, and were not satisfied with their communication) and if the daughter resided in the same house as her mother.

Contrary to our expectations, we found no evidence that emerging adults' living arrangements moderated the association between maternal supervision and drunkenness. Rather, the results suggested that

Table 3
Parameter estimates for the effects of maternal behaviors on emerging adults' recent drunkenness (full sample).

Independent variable	Model 1 Main effects		Model 2a Warmth		Model 3a Warmth		Model 2b Supervision		Model 3b Supervision	
	b	SE	b	SE	b	SE	b	SE	b	SE
Living home	–0.26	0.30	–1.73	1.18	–2.58 ⁺	1.37	–1.48	1.21	–1.46	1.48
Maternal drunk	0.32**	0.11	0.59*	0.29	0.45***	0.35	0.09	0.21	0.10	0.30
Maternal warmth	0.12	0.13	0.13	0.19	0.07	0.21	0.06	0.13	0.06	0.13
Maternal supervision	–0.19 ⁺	0.11	–0.24*	0.11	–0.24*	0.11	–0.36*	0.17	–0.36 ⁺	0.22
Maternal drunk × parenting			–0.11	0.09	–0.07	0.11	0.06	0.06	0.06	0.10
Living × maternal drunk			0.27	0.22	0.97 ⁺	0.57	0.10	0.18	0.09	0.41
Living × parenting			0.29	0.27	0.50	0.33	0.29	0.27	0.28	0.38
LH × MD × parenting					–0.16	0.15			0.00	0.13
R ²	0.21		0.23		0.24		0.23		0.23	
Cohen's f ²	–		0.03		0.04		0.03		0.03	

Note. b = unstandardized path coefficient; SE = standard error; LH × MD × Parenting = Interaction of Living Home by Maternal Frequency of Drunkenness by Parenting Behavior (a = Warmth; b = Supervision). All models include sample weighting and control variables (Race, Gender, Age, and SES) and were estimated using Maximum Likelihood with Robust Standard Errors.

⁺ $p < 0.10$.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

Table 4

Parameter estimates for the effects of maternal behaviors on female emerging adults' recent drunkenness.

Independent variable	Model 1 Main effects		Model 2a Warmth		Model 2b Warmth		Model 3a Supervision		Model 3b Supervision	
	b	SE	b	SE	b	SE	b	SE	b	SE
Living home	−0.76***	0.21	−1.61*	0.73	−3.05***	0.89	−1.65*	0.71	−1.95 ⁺	1.04
Maternal drunk	−0.02	0.13	0.08	0.20	−0.16	0.25	−0.29	0.24	−0.33	0.28
Maternal warmth	0.07	0.11	0.13	0.17	0.01	0.19	0.07	0.11	0.07	0.11
Maternal supervision	−0.12	0.10	−0.13	0.10	−0.12	0.09	−0.25	0.16	−0.28	0.18
Maternal drunk × parenting			−0.05	0.06	0.02	0.08	0.09	0.08	0.11	0.11
Living × maternal drunk			0.50*	0.21	1.45***	0.28	0.38	0.22	0.59	0.46
Living × parenting			0.05	0.18	0.44 ⁺	0.24	0.10	0.17	0.19	0.31
LH × MD × parenting					−0.26**	0.09			−0.06	0.15
R ²	0.30		0.32		0.34		0.33		0.33	
Cohen's f ²	–		0.03		0.06		0.04		0.04	

Note. b = unstandardized path coefficient; SE = standard error; LH × MD × Parenting = Interaction of Living Home by Maternal Frequency of Drunkenness by Parenting Behavior (a = Warmth; b = Supervision). All models include sample weighting and control variables (race, gender, age, and SES) and were estimated using Maximum Likelihood with Robust Standard Errors.

* $p < 0.05$.** $p < 0.01$.*** $p < 0.001$.⁺ $p < 0.10$.

mothers' supervisory activities (trying to know about her offspring's activities, including drinking) were protective, regardless of the emerging adult child's living arrangements. Thus, a complex picture emerges regarding the associations among maternal behaviors and emerging adults' alcohol use. Regardless of living arrangements, male emerging adults who were more likely to witness their mother getting drunk were themselves more likely to engage in risky drinking. However, among female emerging adults, this synchronous pattern was strongest among participants who resided with their family and also reported low levels of maternal warmth. These results are consistent with past studies that have found concordance between sons' alcohol use and their mothers' drinking behaviors (Andrews et al., 1997; Cooper et al., 1995; Jung, 1995) but add further nuance by suggesting that similar concordance for females depends upon the family context. Similarity in mother–daughter drinking patterns is most likely found in households characterized by a negative relationship between the mother and a co-residing daughter.

4.2. Theoretical and prevention implications

We framed our research aims and hypotheses within the context of two competing theoretical perspectives. For female emerging adults, the pattern of results was more consistent with the tenets of Social Control Theory (Hirschi, 1969) than with Social Learning Theory explanations (Bandura, 1986). Our findings suggest that female NCB emerging adults who continued to reside in the family home were most likely to

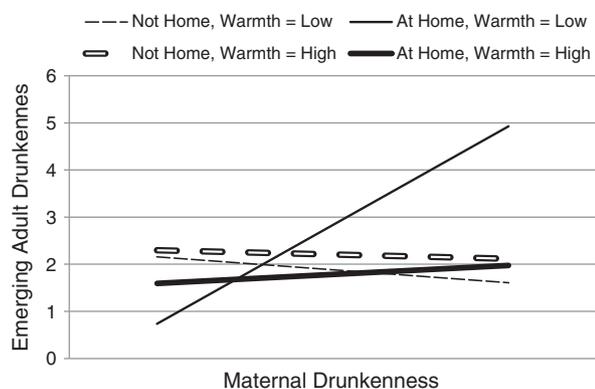


Fig. 1. Relationship between female emerging adults' recent drunkenness and maternal drunkenness modeling, separately for levels of maternal warmth and emerging adults' living arrangements.

imitate their mothers' heavy drinking in family contexts characterized by more distant and problematic mother–child relationships. In these situations, we found that a lack of strong ties amplified the risks associated with mothers' heavy use on the daughters' own use of alcohol (Farrell et al., 1995; Urberg et al., 2005; Zhang et al., 1999). Farrell et al. (1995) reported similar effects in a sample of adolescents and discussed the results in terms of social support in the context of a chronic stressor (i.e., a problem-drinking father). Likewise, living in a family with a heavy-using mother is likely to be stressful for youth and this stress may be increased when conflict between the parent and child is high (Chassin et al., 1991, 1993). Our results suggest this scenario may continue to pose risks as the offspring transition from adolescence to emerging adulthood, particularly for female youth. Unfortunately, our study did not include measures of stress or general social support; additional work that includes these constructs may help elucidate the diverse family dynamics that contribute to parent–child concordance in drinking behaviors is needed.

These findings have several implications for future prevention and intervention efforts. Numerous prevention programs have been shown to reduce alcohol use and related consequence among college students (Larimer & Cronce, 2007), including a parent-based intervention (PBI) designed by Turrissi and colleagues (Ichiyama et al., 2009; Mallett et al., 2011; Turrissi, Jaccard, Taki, Dunnam, & Grimes, 2001). The goals of this PBI are to encourage parent–teen communication about alcohol and reduce parental permissiveness of teen drinking. Given the relative ease of administering this PBI, which is delivered via a self-administered handbook, the current results suggest this intervention has potential to be expanded beyond college students to include NCB emerging adults who continue to live with their childhood family, particularly among female youth. Recent research (Varvil-Weld et al., 2012) revealed that this PBI was most effective among subgroups of students with high-risk parent types, defined by high levels of parent–child conflict, lower parental supervision, and heavier parental use of alcohol. Thus, future efforts to expand the scope of PBIs should remind parents about the importance of maintaining trust and honesty with their offspring and greater emphasis may be placed on maintaining strong family bonds as the child transitions into emerging adulthood. Within these parameters, future intervention efforts should also encourage parents to continue to provide appropriate supervision strategies throughout emerging adulthood as well as limiting their own heavy alcohol use.

The prevention implications of the current results for NCB emerging adults who have moved out of their childhood homes are less clear. For many emerging adults, moving out is not a one-way transition. Rather, frequent moves into and out of the family home are common during

Table 5
Parameter estimates for the effects of maternal behaviors on male emerging adults' recent drunkenness.

Independent variable	Model 1 Main effects		Model 2a Warmth		Model 3a Warmth		Model 2b Supervision		Model 3b Supervision	
	b	SE	b	SE	b	SE	b	SE	b	SE
Living home	−0.04	0.43	−1.48	1.78	−3.10	2.71	−1.08	1.97	−0.84	2.29
Maternal drunk	0.45***	0.08	1.14	0.74	1.00	0.75	0.50	0.25	0.59	0.36
Maternal warmth	0.09**	0.18	0.12	0.33	0.05	0.33	0.07	0.19	0.07	0.19
Maternal supervision	−0.18*	0.17	−0.19	0.20	−0.18	0.21	−0.34	0.34	−0.29	0.40
Maternal drunk × parenting			−0.18	0.21	−0.13	0.22	0.02	0.07	−0.02	0.14
Living × maternal drunk			−0.01	0.33	1.51	2.37	−0.23	0.21	−0.37	0.45
Living × parenting			0.45	0.39	0.82	0.59	0.40	0.46	0.32	0.61
LH × MD × parenting					−0.34	0.53			0.06	0.16
R ²	0.25		0.29		0.30		0.28		0.28	
Cohen's f ²	–		0.05		0.06		0.04		0.04	

Note. b = unstandardized path coefficient; SE = standard error; LH × MD × Parenting = Interaction of Living Home by Maternal Frequency of Drunkenness by Parenting Behavior (a = Warmth; b = Supervision). All models include sample weighting and control variables (race, gender, age, and SES) and were estimated using Maximum Likelihood with Robust Standard Errors.

* $p < 0.05$.

** $p < 0.01$.

*** $p < 0.001$.

this stage of life, especially among NCB emerging adults (Kaplan, 2012). We found that maternal supervision was protective against drunkenness in this sample of NCB youth, regardless of their living situation. Similarly, maternal modeling of heavy alcohol use was a significant predictor of offspring heavy use in both living arrangement groups. These findings are consistent with a growing body of research that indicates parents remain an important source of influence, even as adolescents transition out of high school (e.g., Patock-Peckham & Morgan-Lopez, 2007; Wood et al., 2004). Future research that explores possible mechanisms for reaching this relatively hard to reach group of emerging adults is needed. It should be noted that our sample comprised a unique subgroup of NCB emerging adults, including a substantial proportion with less than a high school education, but excluded those who attended trade schools and 2-year community colleges. The youth we included may represent the most challenging group of NCB emerging adults to reach, despite their likelihood of being at greatest risk for development of future alcohol problems (Muthén & Muthén, 2000; White et al., 2005).

4.3. Limitations and future directions

Several other limitations of the current study offer additional areas for future research. First, all analyses were based on cross-sectional data, and provided solely by the emerging adult participants regarding their mothers' behaviors. Longitudinal data will allow stronger conclusions regarding the associations between parental behaviors and offspring's alcohol use. Studies that include mothers' as well as fathers' own reports may further bolster the evidence for continued parental influence on NCB emerging adults' alcohol use. Finally, our study included a limited set of parental behaviors and only tested three-way interactions between living arrangements, mothers' alcohol use, and two indicators of positive parenting and their associations with one alcohol use outcome (frequency of recent drunkenness). The additional variance explained by the interaction terms in these analytic models resulted in modest effect sizes, at best. It is thus possible that additional combinations of positive parenting behaviors and mothers' alcohol use may also be important to consider as well as other alcohol use outcomes. For instance, previous research indicates a permissive parenting style (i.e., high warmth, low supervision, and high parental permissiveness regarding offspring alcohol use) was related to higher drinking in college students (Mallett et al., 2011). We also did not examine how other demographic characteristics, such as participants' race/ethnicity, may further moderate these associations. Person-centered methods that examine multidimensional models, of both parenting styles

(Abar, 2012; Varvil-Weld et al., 2012) and alcohol use (Cleveland, Lanza, Ray, Turrissi, & Mallett, 2012; Cleveland, Mallett, White, Turrissi, & Favero, 2013), offer innovative approaches to testing higher order interactions among these additional constructs (Lanza & Rhoades, 2011).

5. Conclusions

The current study was among the first to examine associations between mothers' positive parenting behaviors, mothers' drunkenness, and offspring's drunkenness in a sample of NCB emerging adults. Results from this study lend support to previous research that finds the impact of parental modeling of heavy alcohol use on offspring's alcohol use depends on the gender of the child. This study extends previous research by indicating that for female NCB emerging adults, these modeling effects were present only among those who continued to live at home with their childhood family and also reported low levels of mother-daughter warmth. Future prevention efforts that build on a PBI, which was developed for college students, offer potential avenues to reduce risky drinking behaviors among this vulnerable and understudied population of youth.

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Contributors

Authors Cleveland, Turrissi, Mallett, and White designed the study. Cleveland and Reavy conceptualized the study aims. Reavy conducted literature searches and contributed to the Introduction. Cleveland conducted the statistical analysis. Cleveland wrote the first draft of the manuscript and all authors contributed to and have approved the final manuscript.

Conflict of interest

All authors declare that they have no conflicts of interest.

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