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The Effects of Mothers' Protective Parenting and Alcohol Use on Emerging Adults' Alcohol Use: Testing Indirect Effects through Prototype Favorability among African American Youth

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Abstract

Background—We examined how mothers' protective parenting and alcohol use influenced changes in offspring's heavy drinking among a sample of African American youth. The conceptual model also tested indirect effects of mothers' behaviors, through changes in the youths' social images (i.e., prototypes) of heavy drinkers, derived from the Prototype Willingness (PW) model.

Materials and Methods—Participants were 686 emerging adults (55% female) from the *Family and Community Health Study (FACHS)*, an ongoing prospective study of African American families. Three waves of *FACHS* data were used: T3 during 10th grade (*M* age = 16.3 years), T4 shortly after high school (*M* age = 19.4 years), and T5 three years later (*M* age = 22.1 years). Mothers' self-reports of protective parenting and alcohol use were assessed at T4. Two separate path models tested the study hypotheses. The first model specified direct and indirect effects of mothers' protective parenting and alcohol use. The second model added interaction terms between the protective parenting behaviors and mothers' alcohol use. The analyses were first conducted using the full sample and then repeated separately for female and male participants.

Results—Maternal alcohol use had a positive and direct effect on offspring's alcohol use. Mothers' endorsement of alcohol-related rules inhibited normative increases in the favorability of the offspring's social image of heavy drinkers (prototype) while her warmth was positively related to these increases. Maternal alcohol use amplified the positive association between mothers' warmth and the daughters' increased drinking. For sons, maternal alcohol use increased the positive association between alcohol-related rules and increased prototype favorability.

Conclusions—Results indicated clear gender differences in how mothers' behaviors influence her offspring's alcohol use during the transition to emerging adulthood. Interventions that target culturally-specific risk and protective factors within the family environment are needed to reduce health disparities among this vulnerable population of youth.

Keywords

Alcohol Use; African American; Emerging Adulthood; Parenting; Modeling

Between 2001 and 2013, the prevalence of alcohol use and alcohol use disorders (AUD) in the U.S. increased at alarming rates among all sociodemographic groups (Grant et al., 2017). Especially alarming was evidence that these increased rates were pronounced for certain subgroups, including African American individuals whose rates of high-risk drinking increased more than 60% and rates of AUD increased more than 90% (Grant et al., 2017). Although Grant and colleagues' report noted that these increases were highest among older individuals, prevalence rates for all drinking behaviors were highest among the youngest cohort (ages 18-29 years). For example, the 12-month prevalence rate of AUD among this cohort (23.4%) was more than 60% higher than that of the next oldest cohort (14.3% among individuals 30-44) and more than twice that of those aged 45-64 (9.8%). These results are consistent with a large body of research that identifies emerging adulthood – generally defined as the ages between 18-29 years (Arnett, 2005) – as a critical period in the lifespan when rates of alcohol and other substances peak (Hingson et al., 2009; Johnston et al., 2016).

The overall trends highlighted above obscure important racial and ethnic group differences in developmental patterns of alcohol use: African American emerging adults report lower levels of use as well as slower escalation of drinking over adolescence and emerging adulthood, compared to other groups (Zapolski et al., 2014). These differences are especially noteworthy in light of research that indicates African American youth are disproportionately exposed to contextual risk factors for substance use, including economic pressures, neighborhood disorganization, and racial discrimination (Wallace Jr and Muroff, 2002). Hence, this pattern suggests there are unique protective factors that may mitigate against these risks (Maslowsky et al., 2015). For example, previous research has established the importance of the family context in protecting African American adolescents from alcohol and substance use (Cleveland et al., 2005; Maslowsky et al., 2015; Odgers et al., 2012). The current study examines the protective role of the family context in predicting changes in African American emerging adults' alcohol use.

Role of Parents in Predicting Emerging Adults' Alcohol Use

Children fare best when raised in family environments that are characterized by warm and supportive relationships in conjunction with age-appropriate supervision (Barnes et al., 2000; Steinberg, 2001). Recent studies demonstrate that practicing such parenting behaviors, collectively referred to hereafter as “protective parenting” during children's adolescence can have lasting effects and predict alcohol use during emerging adulthood (Englund et al., 2008; Stone et al., 2012). Protective parenting processes also include parent-child

communication (Brody et al., 2016; Simons et al., 2006); however, evidence is mixed whether general communication or alcohol-specific communication is a stronger predictor of offspring behavior (Ennett et al., 2001; Ryan et al., 2010). Other studies indicate that parental endorsement of rules against underage drinking is prospectively associated with college students' changes in high-risk drinking and related consequences (Abar and Turrissi, 2008; Patock-Peckham and Morgan-Lopez, 2006; Varvil-Weld et al., 2012; Walls et al., 2009).

Within the family environment, parental modeling of alcohol use is also a strong predictor of their offspring's alcohol use during both adolescence (Alati et al., 2014; Latendresse et al., 2008) and emerging adulthood (Casswell et al., 2002; Merline et al., 2008; Saunders et al., 2016). Notwithstanding the dramatic increased rates of alcohol use cited above (Grant et al., 2017), African American youth, on average, may be more likely to be exposed to abstinence models and norms than their non-African American peers (Zapolski et al., 2014). However, few studies have examined the influence of parental alcohol use on offspring's use among African American families (Jordan and Lewis, 2005). Thus, it is unclear how parental modeling of alcohol use (or abstinence) impacts African American youths' alcohol use during the high-risk transition from adolescence into emerging adulthood.

This gap is concerning because past research suggests the family context may be more central to the psychosocial development of African American youth relative to other groups (Jones et al., 2008; Klima et al., 2014). For example, some research indicates African American youth are more closely attached to their parents than are White youth (Elmore and Gaylord-Harden, 2013; Giordano et al., 1993; Wilson et al., 2009). African American parents are also more likely to closely monitor their children's behavior and provide stricter guidelines for alcohol use (Giordano et al., 1993; Wallace Jr and Muroff, 2002).

Mediating and Moderating Effects of Parental Influence

A number of other questions regarding parental influence remain unanswered in the literature. Foremost, there is uncertainty about whether the effects of parental alcohol use are contingent upon other family dynamics. Some studies indicate parent-child concordance in drinking behaviors is more likely when the offspring values the parent, as evidenced by a close parent-child relationship (Andrews et al., 1997; Cooper et al., 1995; Jung, 1995). This pattern implies a *risk-enhancing* effect of close parent-child bonds. Other studies indicate a warm and supportive family environment can counter the negative effects of parental alcohol misuse (Cleveland et al., 2014; Ennett et al., 2008; Farrell et al., 1995; Kuendig and Kuntsche, 2006; Zhang et al., 1999). This type of *buffering* effect might suggest that the offspring “do as the parents say, not as they do” (Urberg et al., 2005).

These discrepant conclusions may be due to methodological differences. For example, most of this research has defined parental alcohol use as abuse or dependence (Cooper et al., 1995; Pearson et al., 2012), with less emphasis on examining parental alcohol use along a continuum. It is also important to consider the gender of the child as well as which parent (mother or father) is the modeling or bonding source. There is some evidence that family processes may be more closely related to girls' substance use compared to boys (Kelly et al.,

2011a, 2011b; Soloski and Berryhill, 2016), and that there is gender specificity in terms of intergenerational transmission of substance use patterns (Windle and Windle, 2012; Yu and Perrine, 1997). Although a few studies have examined moderation effects among emerging adult samples (Cleveland et al., 2014; Jung, 1995; Pearson et al., 2012; White et al., 2000), no studies have examined these processes among African American emerging adults.

In addition to moderating effects, few studies have tested the extent to which protective parenting processes or alcohol use modeling indirectly influence offspring's behavior by shaping the attitudes and cognitions that offspring develop about alcohol use and alcohol users (Ouellette et al., 1999). Recent research that has examined the indirect mechanisms has generally focused on two broad domains of cognitive antecedents of alcohol use. Within the first domain are motivational models of alcohol use that propose alcohol-related outcome expectancies (i.e., personal beliefs about the effects of drinking alcohol) and drinking motives (i.e., reasons for drinking alcohol to obtain a desired outcome) as primary antecedents to alcohol use (Agrawal et al., 2008). The current study focuses on the second domain of cognitive antecedents, known as prototypes, or social images (Gibbons and Gerrard, 1995). Prototypes are a central element in the prototype/willingness (PW) model of health behavior (Gibbons et al., 2003; Gibbons and Gerrard, 1997), described next.

The Prototype Willingness Model

Briefly, the PW model is a dual-processing model that hypothesizes two pathways to risk behavior: a reasoned path and a social reaction path. The reasoned path describes behavior as a result of intentional decision-making (Ajzen, 1991). We focus here on the second, social reaction path, which includes behaviors that are not necessarily planned or deliberate but, rather, are determined by willingness to engage in the behavior. According to the PW model, this social reactive process is image-based; i.e., individuals have clear cognitive representations or social images (i.e., prototypes) of the *type* of person who engages in a particular health behavior (Gerrard et al., 2008) and these images affect their behavior. For example, adolescents have clear images of peers who engage in alcohol use (i.e., a “typical drinker”). Individuals also realize that if they choose to engage in the behavior in public, they are likely to be identified as members of the group that the image represents (e.g., the “typical drinker”). In this sense, prototypes are social consequences of behaviors – engage in the behavior and acquire the social image. Generally, the more acceptable a particular image is to an individual (i.e., the more favorable the prototype), the more willing he or she is to engage in the behavior (Gibbons and Gerrard, 1995). For example, if an individual perceives the type of person who drinks alcohol as popular, then that individual will be more willing to drink.

Previous research based on the PW model demonstrates that favorability of risk prototypes predicts a variety of health behaviors among both adolescent and young adult populations (see Gibbons et al., 2015, 2003 for reviews and Todd et al., 2016; van Lettow et al., 2016 for meta-analyses). Several of these studies have documented a link between alcohol prototypes and adolescent (e.g., Andrews et al., 2008; Gerrard et al., 2002) and young adult (Spijkerman et al., 2010) drinking. A number of studies have confirmed that adolescents' perceptions of risk prototypes are influenced by several factors, including media sources

(Gibbons et al., 2010), favorability of parents' own prototypes (Ouellette et al., 1999), and parent and peer substance use (Gerrard et al., 2008). There is also evidence that protective parenting behaviors, including warmth, supervision, and communication are associated with less favorable risk prototypes among adolescents (Cleveland et al., 2005; Wills et al., 2003). To date, however, no studies have examined these associations among emerging adults -- when alcohol use becomes normative.

The Current Study

This study addressed these gaps using longitudinal data from a sample of African American youth and their primary caregiver (PC), who most often identified as the biological mother. As described below, we restricted the analysis to PCs who self-identified as female; thus, we refer hereafter to PCs as *mothers* and discuss parental behaviors as *maternal* influences. The conceptual model that guided the study is pictured in Figure 1. The model posits that maternal behaviors, exhibited during emerging adulthood, directly influence offspring's subsequent alcohol use. Consistent with the PW model, the model posits that maternal behaviors also have indirect influences on offspring's alcohol use, through changes in the youth's drinker prototype favorability. Finally, the model also specifies that maternal alcohol use may moderate the impact of protective parenting on offspring's alcohol use. Thus, interactions among the protective parenting processes and alcohol use modeling are depicted in Figure 1.

We tested four specific hypotheses. The first two hypotheses concern indirect effects of maternal influences. First, we expect that higher levels of protective parenting processes (warmth, alcohol-related communication, alcohol-related rules, and supervision) inhibit or reduce the normal increase in prototype favorability, which, in turn, is associated with a decrease in the normal upward trajectory of emerging adults' alcohol use (*Hypothesis 1*). Conversely, we expected that mothers' alcohol use will predict increased risk prototype favorability, leading to increased rates of alcohol use among the emerging adults (*Hypothesis 2*).

The third hypothesis addressed the possibility that the influence of protective parenting processes on offspring's alcohol use are moderated by the effect of mothers' alcohol use. We expect to find that emerging adults' alcohol use will be most strongly related to their mothers' alcohol use within the context of close maternal bonds (*Hypothesis 3*). This hypothesized risk-enhancing effect was proffered because of the close family ties among African American families and the age of the offspring in the current study. As described below, almost all of the participants were above the legal drinking age by the end of the study. For these reasons, we did not expect to find support for the alternative hypothesis that would posit a buffering influence, such that a close relationship allows the emerging adult offspring to adopt their mothers' values, regardless of her behavior.

All analyses were first conducted among the full sample and then repeated separately for male and female participants. Based on past studies that support gender specificity in terms of parent-child intergenerational transmission of substance use patterns and parental influence on adolescent alcohol use (Kelly et al., 2011a, 2011b; Soloski and Berryhill, 2016;

Windle and Windle, 2012; Yu and Perrine, 1997), we predict stronger associations between mother behaviors and emerging adult outcomes among mother-daughter dyads than among mother-son dyads (*Hypothesis 4*).

Methods

Participants

The participants in the current study are part of a larger project, the Family and Community Health Study (FACHS). FACHS is a longitudinal study that is examining the impact of contextual factors on the mental and physical health of African American families who reside in rural communities, suburbs, and small metropolitan areas. A total of 889 families in Iowa and Georgia were recruited for participation in FACHS. Each family included a child who was in 5th grade who self-identified as African American or Black, and a PC, defined as an adult living in the same household as the adolescent who was primarily responsible for his or her care. Most of the PCs were female (94%) and biological mothers of the target child (84%); other PCs included fathers, grandmothers, stepparents, and foster parents.

The present study used data from T3 to T5 in order to focus on the effects of parenting behaviors administered when the target offspring was transitioning into emerging adulthood. For most target youth, T3 occurred during 10th grade ($Mage = 16.3$ years), T4 occurred shortly after high school ($Mage = 19.4$ years), and data for T5 were collected three years later during emerging adulthood ($Mage = 22.1$ years). We restricted the analysis sample to include only those youths whose PC self-identified as female and was present at T4 ($N = 686$). Most of these individuals (92%) were either biological, step, or adoptive mothers; about 4% were the targets' grandmother. Previous research with FACHS indicates that although few of the mothers reported regular drinking ($< 20\%$ drink every week or more), more than half (60%) reported experiencing at least one alcohol-related problem in the last year (Gerrard et al., 2018).

Recruitment Procedures

Families were recruited from 259 block group areas in Iowa and Georgia. Sites included rural communities, suburbs, and small metropolitan areas. Community coordinators and school liaisons compiled lists of all families in the area that included a 5th grade African American child. Potential participant families were chosen randomly from these lists, and complete data were gathered from 72% of the families on the recruitment lists. Those who declined to participate almost always cited the amount of time the interview took (up to 3 hours per visit) as the reason. Median family income at T1 was \$20,685/year (\$31,691 in 2018 dollars); 33% of the families were living below the poverty line. Written informed consent was obtained from participants at every wave and families received compensation for their participation (\$70 - \$125 per wave for adolescents; \$100 - \$125 per wave for mothers). Further description of the FACHS sample and recruitment is available in (Cutrona et al., 2000) and (Gibbons et al., 2004).

Measures

The primary outcome variable for the analyses (emerging adults' alcohol use) was assessed at T3 and T5. Emerging adults' prototype images were assessed at T3 and T4. Protective parenting behaviors and mothers' alcohol use were measured at T4 (during emerging adulthood), using the mothers' self-reports.

Emerging Adults' Alcohol Use—At T3 (age 16), participants responded to an item that asked “Next we'd like to ask you some questions about alcohol. During the past 12 months, how often have you had a lot to drink – that is, 3 or more drinks at one time?” Six response options were provided (*never, 1-2 times, about 3-11 times, a few times per month, about 1-2 times per week, and several times per week*). At T5, participants first reported the number of times during the past year they had drunk any amount of alcohol (i.e., beer, wine, hard liquor). Those who indicated drinking alcohol at least 1-2 times in the past year were asked to respond to the same alcohol use item as above, using the same 6-point response scale (1 = *never*, 6 = *several times per week*). Participants who did not respond to the second item (past 12-month drinking) due to the skip pattern imposed by the first item (any drinking) were given a score of “0.”

Mothers' Protective Parenting Behaviors—Separate subscales assessed mothers' self-reported warmth, alcohol-related rules, supervision, and communication about alcohol and other substances. The subscales, described below, were adapted for FACHS from instruments developed for the Iowa Youth and Families Project (IYFP; Conger et al., 1992; Conger and Elder, 1994). Previous research has shown that these measures are valid and reliable. For example, analyses from IYFP indicated these instruments correlated with child reports and observer ratings of parental behavior (Conger et al., 1992; Simons, 1996). Prior to data collection in FACHS, focus group feedback indicated the subscales were meaningful to African American parents and captured what they considered to be important dimensions of supportive parenting (Simons et al., 2006).

Maternal **warmth** was assessed with eight items, such as “I frequently tell [target] that I love [him/her]” and “When there is a problem at home, I sit down with [target] so we can figure out how to solve it.” The eight items were measured on 5-point scales (1 = *never*, 3 = *sometimes*, 5 = *always true*) and combined to create an overall index ($\alpha = 0.88$). Mothers' **supervision** practices were measured with two items, each one on a 4-point scale (1 = *never*, 4 = *always*): “How often do you know where [target] is and what [s/he] is doing?” and “How often do you know if [target] does something wrong?” ($r = 0.47$). Two items, measured on 5-point scales (1 = *strongly disagree*, 3 = *neutral or mixed*, 5 = *strongly agree*) were combined to create an index of maternal **alcohol-related rules and consequences**: “I have clear and specific rules about whether [target] can hang out with peers who use alcohol” and “I have explained the consequences of not following my rules concerning alcohol use to [target]” ($r = 0.73$). Three items assessed mothers' communication about alcohol and other substances: “How often in the past 12 months have you talked to [target] about smoking cigarettes/drinking alcohol/using drugs?” The three items were measured on a 3-point scale (1 = *never*, 2 = *sometimes*, 3 = *often*) combined to create an overall index of **substance-related communication** ($\alpha = 0.91$).

Mothers' Alcohol Use—The mothers' interviews included several items concerning their own alcohol use. The mothers were asked, “During the past 12 months, how often did you: a) drink beer? b) drink wine, wine coolers, or other wine drinks? and c) drink hard liquor, such as bourbon, vodka, whiskey, gin, tequila, etc.?” A standard drink definition was defined as a glass of wine, a wine cooler, a bottle or can of beer, a shot glass of liquor, or a mixed drink. Six response options were available (1 = *never* to 6 = *every day*). The three items were averaged to create an overall index ($\alpha = 0.52$).

Alcohol Prototype Favorability—Emerging adults' images of heavy drinkers were measured using established procedures (Gibbons and Gerrard, 1997). The items were preceded by this lead-in statement: “Take a moment to think about the type of [kid (T3) / people (T4)] your age who frequently drink/s a lot of alcohol.” Participants were then asked to describe their image of the person (i.e., image favorability) using four adjectives (*popular, smart, cool, attractive*), each accompanied by 4-point scales from *not at all* to *very*. The items were coded with a higher score indicating a more favorable perception of peers who drink a lot of alcohol and the average was taken across the four items (T3: $\alpha = 0.88$, T4: $\alpha = 0.89$).

Control Variables—Four control variables were included in the analyses: participants' age, risk-taking tendency, SES, and gender. *Age* was calculated using data from the participants' date of birth and interview administration. *Risk-taking tendency* was measured at T4, using six items adapted from Eysenck and Eysenck (1977). Sample items included “You would prefer doing something dangerous rather than sitting still” and “You enjoy taking risks,” each measured on a 3-point Likert scale (1 = *not true at all*, 2 = *somewhat true*, 3 = *very true*). The six items were combined to create a single indicator of risk-taking tendency ($\alpha = 0.91$). Participants' *SES* was computed by combining mothers' reports of gross household income (averaged over T1 and T2 reports) and the highest level of education she completed at T2. Participants' *gender* was coded as 0 = male, 1 = female.

Analysis Plan

A series of path analysis models was estimated using Mplus version 7.4 (Muthén and Muthén, 1998) to address the study aims. As depicted in Figure 1, we hypothesized mothers' behaviors would have both direct and indirect effects on emerging adults' alcohol use, accounting for the stability in the emerging adults' alcohol use between T3 and T5. Thus, *changes in alcohol use* during the transition to emerging adulthood were predicted. The exogenous variables (T3 alcohol use and prototype favorability, T4 parenting behaviors, and the control variables) were assumed to be correlated. Thus, two separate, fully-saturated path models were estimated. In the first model, the main effects of mothers' protective parenting behaviors and alcohol use were estimated. This model also specified indirect effects of mothers' behaviors on offspring alcohol use, through changes in prototype favorability between T3 and T4. The indirect effects were computed using the delta method in Mplus (Muthén and Muthén, 1998) to test Hypotheses 1 and 2. In the second model, interaction terms were created by multiplying each of the four protective parenting behaviors with mothers' alcohol use to test Hypothesis 3. The above analyses were first conducted using the

full sample and then repeated separately for female and male participants to examine Hypothesis 4.

Following procedures outlined in Preacher and colleagues (2006), we evaluated significant interaction effects by obtaining significance tests for simple slopes across high and low scores of the mothers' alcohol use using estimated parameters and the associated covariance matrix. All predictor variables regarding mothers' behaviors were centered prior to entry in order to reduce collinearity and facilitate interpretation of coefficients. To account for non-normality in the data, all models were estimated using maximum likelihood with robust standard errors (MLR). To take advantage of full information maximum likelihood (FIML) for missing data (Enders and Bandalos, 2001), parameter estimates and standard errors were estimated using all available information from partially missing cases (Graham, 2009).

Results

Missing Data Analyses

Preliminary analyses using the full FACHS sample ($N = 889$) were conducted to determine the extent of missing data. Of the 889 participants, 565 participants (64%) had complete data across all five waves and 81% completed at least four of the five waves. Less than 10% of the sample ($N = 74$, 8%) completed two or fewer waves. Subsequent analyses revealed that the data were not missing completely at random (MCAR): $\chi^2(1133) = 1569.70$, $p < 0.001$ (Little, 1988). Univariate t-tests revealed that participants with complete data were more likely to report higher scores on three of the four protective parenting behaviors at T4 (alcohol related rules, relationship warmth, and monitoring). Comparisons also revealed that the likelihood of missing data at T5 was significantly associated with the targets' risk-taking, age, gender, and SES. Inclusion of these variables in the path models allowed us to meet the missing at random (MAR) assumptions that underlie FIML estimation techniques (Enders, 2006).

Inter-Item Correlations and Descriptive Statistics

Table 1 presents the inter-item correlations for the study variables, separately by participants' gender. SES was negatively correlated with mothers' substance-related communication for both males and females. For both genders, age was negatively correlated with three of the four parenting behaviors: rules, communication, and supervision. Among the females, age was also negatively correlated with mothers' warmth. For both males and females, risk-taking was positively associated with prototype favorability (at both assessments) as well as T3 alcohol use (and T5 alcohol use among females). Mothers' self-reported supervision was negatively correlated with male and female offspring's alcohol use at both assessments, and negatively correlated with daughters' prototype favorability (also at both assessments).

Table 1 also provides the descriptive statistics for all study variables, separately for male and female participants. Although both genders reported an increased frequency of alcohol use between T3 and T5, the average level of use did not exceed 3-11 times in the past year (i.e., a value of 3 on the 6-point scale) for either group. Significant mean differences between male and female participants were found for three variables: sons reported higher levels of

risk-taking, alcohol-related communication, and T5 alcohol use (p -values < 0.001). For both sons and daughters, mothers' reports of warmth, alcohol-related rules, and alcohol use exhibited moderate negative skewness (all values < -1.00). Thus, a plurality of mothers reported highest possible values for warmth (25%) and alcohol-related rules (46%). About half of the mothers (51%) reported not drinking at all; 30% reported drinking less than weekly and 12% reported drinking once or twice weekly. Less than 10% reported drinking three or more times a week.

Testing Main and Interaction Effects across the Full Sample

Table 2 presents the results of the path analysis models using the full sample. Model 1 tested main effects of mothers' behaviors and Model 2 examined two-way interactions among the four positive parenting behaviors and mothers' alcohol use. Within each model, the first set of columns represents the standardized effects of each predictor on T4 prototype favorability and the second set of columns displays the standardized path coefficients for predictors of T5 alcohol use, both controlling for T3 alcohol use.

Three significant direct effects of mothers' behaviors on prototype favorability were found in Model 1 for the full sample. Mothers' self-reported alcohol-related rules and consequences were negatively related to increases in prototype favorability, as were mothers' reports of supervision. Mothers' warmth was positively related to increases in prototype favorability. Additionally, mothers' own alcohol use was positively related to her offspring's increased alcohol use at T5. Increases in favorable prototypes were associated with increased alcohol use at T5. The resulting indirect effect of mothers' warmth on alcohol use was significant (standardized indirect effect = 0.01 95% CI [.004, .03], $p < 0.05$). The indirect effects of mothers' alcohol-related rules or supervision were only marginal (both p -values < 0.10). The results of Model 2, which specified interaction terms between mothers' self-reported alcohol use and each of the protective parenting behaviors, are displayed on the right side of Table 2. Among the full sample, mothers' self-reported warmth significantly moderated the association between mothers' alcohol use and changes in emerging adults' alcohol use.

Testing Main and Interaction Effects Separately by Gender

Table 3 displays the results of models predicting alcohol use among the daughters. Results for Model 1 indicated mothers' reports of alcohol-related rules and supervision were both negatively related to changes (increases) in daughters' prototype favorability. Neither of the indirect effects on changes in daughters' alcohol use were significant. Model 2 indicated there was a significant interaction between mothers' self-reported warmth and alcohol use on daughters' increased alcohol use. To probe the interaction, we computed simple intercepts and simple slopes at three levels of mothers' self-reported alcohol use. Due to the skewed distribution, the three values of mothers' alcohol use were specified as the three lowest response options (never, less than once per week, and 1-2 times per week). As seen in Figure 2, mothers' warmth was positively associated with daughters' increased alcohol use if the mother was a drinker (i.e., only at the two higher levels of self-reported alcohol use). Among mothers who reported no alcohol use, the association between warmth and daughters' alcohol use was not significant.

Table 4 displays the results of models predicting alcohol use among the sons. Results for Model 1 indicated mothers' warmth was positively related to increases in prototype favorability, whereas mothers' self-reported alcohol use was negatively related to increased prototype favorability. The indirect effect of mothers' warmth on changes in sons' alcohol use, through changes in prototype favorability, was significant (standardized indirect effect = 0.04, 95% CI [.008, .08], $p < 0.05$). Among the sons, there was a significant interaction between mothers' endorsement of strict alcohol-related rules and her alcohol use on increased prototype favorability. This interaction was also probed using the three lowest levels of mothers' alcohol use. The interaction (Figure 3) suggested that mothers' endorsement of rules and consequences was most strongly (and positively) associated with changes in sons' prototype favorability among mothers who were regular drinkers (i.e., reported the highest level of alcohol use: 1-2 times weekly). Conversely, the association between mothers' endorsement of rules and consequences and sons' prototype favorability was not significant among sons whose mothers reported no alcohol use in the previous year.

Discussion

We examined the extent to which African American mothers' behaviors, assessed shortly after their children graduated from high school (mean age 19), predicted changes in their offspring's prototype images, thereby indirectly influencing changes in alcohol use during emerging adulthood (mean age 22). The results revealed several significant findings. Addressing Hypothesis 1, mothers' endorsement of clear and specific rules about alcohol use and greater supervision of their offspring were both negatively associated with increases in their offspring's alcohol-related prototypes and resulted in marginally significant indirect effects on subsequent alcohol use. Thus, implementation of protective parenting behaviors inhibited the normative increase in risky prototypes during the transition from adolescence to emerging adulthood. Results using the full sample also demonstrated mothers' alcohol use had a positive direct effect on increased alcohol use among the emerging adults, despite the fact that relatively few mothers reported any alcohol use. The hypothesized indirect effect of mothers' alcohol use through changes in prototype favorability was not supported, however.

Also contrary to our expectations, we found that higher levels of maternal warmth were related to more favorable risk prototypes and subsequent increased alcohol use by the offspring among the full sample. Our hypothesis was based on a large literature that suggests family cohesion is generally protective against adolescent and emerging adult alcohol use, although a few studies have found inconsistent associations between parental warmth and offspring drinking (Barnes et al., 2006; Chapple et al., 2005; Ennett et al., 2001). Particularly relevant to our unexpected findings is evidence that parenting styles, defined by combinations of warmth and control, may be different during emerging adulthood, when parents are expected to adapt to the unique demands of emerging adult offspring, such as achieving autonomy and independence (Nelson et al., 2011). Within this literature, a few studies have noted that permissive parenting styles (defined by high levels of warmth combined with low levels of control) are positively associated with emerging adults' drinking behaviors, via indirect links on the offspring's impulsiveness (Patock-Peckham et al., 2011; Patock-Peckham and Morgan-Lopez, 2006). We focused on combinations of

maternal alcohol use and each of the protective parenting behaviors; thus, model complexity did not allow us to also examine interactions among the parenting behaviors.

Maternal Influences on Daughters

Separate gender-specific models revealed several nuances for these associations. Among daughters, we found a positive association between maternal warmth and increased alcohol use that was exacerbated when the mother modeled alcohol use. On the other hand, mothers' warmth was not related to daughters' alcohol use when the mother reported no alcohol use, lending support to Hypotheses 3 and 4. There is general consensus that family cohesion is more closely linked to adolescent girls' alcohol use, compared to adolescent boys' alcohol use (Kelly et al., 2011a, 2011b; Soloski and Berryhill, 2016). Our findings extend this literature by confirming these gender differences exist among emerging adult daughters. To our knowledge, the unexpected positive link between maternal warmth and daughters' alcohol use has not been previously reported. However, some authors have also found that family cohesion enhances the effects of parental alcohol use on offspring's alcohol use, such that a high-quality parent-child relationship increases the likelihood that children will imitate the drinking behavior of their parent (Andrews et al., 1997; Brody et al., 1998; Jung, 1995).

Research that addresses this question is relatively scarce and most often focuses on parent-child relations among children and adolescents from non-minority groups. We could not locate any studies that have examined such moderating effects among ethnic minority samples of emerging adults. Because the daughters in our sample were nearly all above the legal drinking age at T5, we can speculate that concordance between mother and daughter drinking, especially in families with close ties, could reflect a pattern in which the mother and daughter are drinking together. There is evidence that African American drinkers (especially females) are more likely to drink at home, whereas White drinkers are more likely to drink in social settings, such as bars or clubs (Herd, 1994; Nyaronga et al., 2009). Noting these differences, Cooper and colleagues (2008) suggested that unique trajectories of alcohol use between African American versus White youth may be due to increased coping motives for drinking among African American drinkers. Given that African American youth are more strongly bonded to their family, and are likely to live at home longer than other youth (Goldscheider et al., 2014), it is possible that the female drinkers in our study relied on their mothers' support as they encountered stressful situations, such as racial discrimination (Gerrard et al., 2012). Although we were unable to explore this possibility, it underscores the need to more fully understand these processes in future research.

Maternal Influences on Sons

For sons, the results were also not as expected: increased favorability of prototype images was predicted by higher levels of maternal warmth, which indirectly led to increased alcohol use. There was also a significant interaction between the mothers' endorsement of strict alcohol-related rules and their alcohol use on son's alcohol use. Increased alcohol use by sons was predicted by mothers' stronger endorsements of alcohol-related rules and consequences, with the strongest association among mothers who themselves reported higher rates of alcohol use. Conversely, the positive association between mothers' endorsement of rules and her son's alcohol use was not significant among mothers who

reported no alcohol use. Our results suggest that if the mother reported more frequent alcohol use, sons may view his mother's imposition of strict alcohol-related rules as inconsistent and respond by drinking even more frequently and by forming less favorable images of drinkers due to a similar reactance process (Ennett et al., 2001; Kam et al., 2017). Regardless of the mothers' alcohol use, however, having a warm maternal relationship (from the mothers' perspective) was directly related to increased favorability of risk prototypes (and subsequent increased alcohol use) among the sons.

Future research that examines sons' and daughters' perceptions of maternal relationships may help untangle the cognitive processes that lead to more favorable risk images and increased use of alcohol during this vulnerable developmental stage. For example, some studies suggest gender-specific effects of maternal closeness on children's alcohol use: for girls (but not boys), this association is mediated through association with high-risk peers (Kelly et al., 2011a). While studies indicate that African American youth are less susceptible to peer influences, relative to White youth (Giordano et al., 1993; Seffrin, 2012; Steinberg and Monahan, 2007; Wallace Jr and Muroff, 2002), it is also important to consider sibling influences, which may be especially salient for African American youth (Pomery et al., 2005; Rowan, 2016). Gender differences in family influences have also been explained by noting that parental disapproval of alcohol use is stronger for sons, relative to daughters (Kelly et al., 2011a).

Prevention Implications

The results have several prevention implications. Foremost, mothers of African American youth should be aware that modeling of excessive alcohol use has a significant impact on their children's alcohol use as they transition into emerging adulthood. Emerging adults whose mothers reported more frequent consumption of alcohol were most likely to increase their own alcohol use during the transition out of high school. Preventive interventions should therefore encourage African American mothers who do not consume alcohol or report infrequent alcohol use -- who comprised the majority of mothers in our sample -- to continue modeling an abstinence approach.

In the full sample, two of the four protective parenting behaviors (endorsement of alcohol-related rules and consequences, and supervision) were negatively related to changes in risk prototypes and subsequent increases in the emerging adults' alcohol use. Thus, mothers should be encouraged to have clear rules about alcohol use and explain these rules to their children, as well as maintain supervision practices even as the child transitions from adolescence to emerging adulthood. However, gender-specific models qualify these general recommendations. Our results suggested that imposition of alcohol-related rules for sons is not protective when the mother herself models drinking behavior, even at moderate levels (less than once per week). Among the mothers who reported abstinence from alcohol, imposition of alcohol-related rules did not influence the sons' behavior. It is also important to note that prototypes are malleable and interventions with both adolescent (Gerrard et al., 2006) and adult (Gibbons et al., 2005; van Lettow et al., 2015) samples have demonstrated that they can be made less favorable. Future research in this area could explore how effects

of parent-based interventions (Ichiyama et al., 2009; Turrisi et al., 2001), which encourage parent-teen communication, could be mediated through changes in prototype favorability.

Limitations

A number of strengths of the study increase confidence in the results. These include the use of a prospective design to bolster interpretation of mediation effects on changes in alcohol use and mothers' self-reports of both parenting behaviors and alcohol use. We also included several control variables to reduce the possibility of confounding variables, including participants' age, SES, and risk-taking tendency. Nonetheless, several limitations of the study should be noted. First, our sample comprised only non-urban African American families from two states. Although this group is underrepresented in the emerging adult literature, the current results may not generalize to other racial and ethnic groups or to African American families who reside in urban areas. We also tested a model of protective parenting processes that included only maternal effects. Future research should include measures of fathers' (male caregivers') parenting behaviors and alcohol use, as well as peer influences (Borsari and Carey, 2001). Finally, we note that our drinking outcome variable was limited to a single item of emerging adults' alcohol use in the past year. Prior research suggests alcohol use is a multidimensional construct that is best described by combinations of frequency and quantity of use, as well as problematic drinking (Auerbach and Collins, 2006; Cleveland et al., 2013a, 2013b).

We also note that the emerging adults in our sample reported relatively low frequency of alcohol use, even at T5 when almost all of the participants (90%) were above the legal drinking age. Only about 12% reported drinking alcohol at least weekly at that assessment. This pattern is consistent with other studies showing African American youth report lower rates of alcohol use, relative to other racial groups (Johnston, 2010; Klima et al., 2014). However, despite these low rates of use, nearly one-third of the sample (29%) reported experiencing alcohol-related problems at T5, including family, work, and friend problems, getting into physical fights, and problems with the law due to their drinking. It is particularly concerning that of the participants who reported experiencing any alcohol-related problem, *all of them* reported experiencing *each type of problem* at least once in the previous year. These results are consistent with other research that has found a racial disparity for problems associated with alcohol use – relative to other groups, African American adults are at greater risk of experiencing negative consequences, even at the same level of consumption (Herd, 1994; Jones-Webb et al., 1997; Mulia et al., 2009; Witbrodt et al., 2014). Of particular relevance to our study, these disparities between amount of use and risk of negative consequences are most pronounced among those who report lower levels of alcohol consumption; that is, among those who rarely drink heavily (Jones-Webb et al., 1997; Mulia et al., 2009; Witbrodt et al., 2014).

Summary and Conclusion

The current study is among the few to examine prospective associations between African American mothers' behaviors, observed during their children's transition to emerging adulthood, and subsequent alcohol use among those offspring. The results offered partial support for the notion that risk prototypes serve as cognitive mediators of maternal

influences on African American emerging adults' alcohol use. Significant differences in the patterns of these associations were found, however, between male and female youth. For sons, mothers' endorsement of strict alcohol-related rules amplified the risk associated with alcohol use modeling, suggesting a reaction by the sons against an inconsistent stance by the mothers. In contrast, alcohol-related rules and consequences were protective among the daughters. Contrary to our expectations, having a warm relationship with mothers was associated with increased frequency of alcohol use, regardless of gender. Among daughters, these close relationships also compounded the risk associated with mothers' alcohol use. Future research that builds on these findings is necessary to develop effective intervention strategies that may protect African American youth from experiencing increased alcohol-related problems as they enter the age when racial disparities become more pronounced.

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Figure 1. Conceptual model of relations among mothers' behaviors, alcohol prototype favorability, and emerging adults' alcohol use.

Figure 2.
Interaction of mothers' warmth and alcohol use on changes in daughters' alcohol use.

Figure 3. Interaction of mothers' alcohol-related rules and alcohol use on changes in sons' prototype favorability.

Table 1

Inter-Item Correlations, by Gender

	SES	Age	Risk	Warm	Rules	Comm	Super	PCAlc	W3Proto	W4Proto	W3Alc	W5Alc
SES	---	0.07	0.07	0.02	0.01	-0.12*	-0.02	0.05	0.13*	0.19*	-0.02	0.21*
Age	-0.02	---	0.04	-0.04	-0.30*	-0.23*	-0.14*	-0.01	0.12 ⁺	0.08	0.03	0.06
Risk	0.11*	0.07	---	0.01	-0.13*	-0.11 ⁺	-0.01	-0.03	0.14*	0.19*	0.13*	0.06
PC Warmth	0.01	-0.11*	-0.09 ⁺	---	0.35*	0.28*	0.33*	0.02	-0.02	0.14*	-0.07	0.00
PC Rules	-0.01	-0.27*	-0.03	0.12*	---	0.42*	0.18*	-0.08	-0.08	-0.04	-0.11 ⁺	-0.10
PC Comm	-0.24*	-0.14*	0.05	0.21*	0.33*	---	0.10 ⁺	-0.01	-0.06	-0.05	-0.02	-0.06
PC Super	-0.11*	-0.21*	-0.09 ⁺	0.22*	0.14*	0.13*	---	-0.11*	-0.06	0.00	-0.14*	-0.14*
PC Alc Use	0.04	0.05	0.04	-0.06	-0.14*	-0.03	0.05	---	0.08	-0.05	0.00	0.11 ⁺
W3 Proto	0.19*	0.07	0.20*	0.02	-0.06	-0.10 ⁺	-0.11*	0.07	---	0.30*	0.22*	0.30*
W4 Proto	0.21*	0.15*	0.20*	0.00	-0.18*	-0.02	-0.22*	0.10 ⁺	0.27*	---	0.15*	0.28*
W3 Alc Use	0.00	0.13*	0.24*	-0.02	-0.01	0.00	-0.11*	0.09 ⁺	0.34*	0.03	---	0.15*
W5 Alc Use	0.10 ⁺	0.10	0.20*	-0.02	-0.03	-0.01	-0.13*	0.12	0.27*	0.23*	0.23*	---
Mean (Male)	0.05	18.79	1.54	4.37	4.29	2.36	2.86	0.79	2.04	2.32	1.28	2.50
SD	0.72	0.86	0.54	0.64	0.84	0.71	0.74	1.05	0.79	0.80	0.75	1.80
Mean (Female)	-0.01	18.77	1.41	4.32	4.26	2.22	2.95	0.81	2.13	2.30	1.30	2.00
SD	0.77	0.90	0.44	0.71	0.88	0.73	0.72	1.02	0.80	0.84	0.78	1.64
T-test	1.14	0.23	3.43***	0.96	0.45	2.66***	1.57	0.30	1.50	0.36	0.31	3.53***

Note: Coefficients above the diagonal refer to MALES (N = 310); coefficients below the diagonal refer to FEMALES (N = 376). Risk = Risk-Taking Tendency; PC = primary caregiver Rules = Alcohol-related rules; Comm = Alcohol-related communication; Super = Supervision; Alc Use = Alcohol Use; Proto = Prototype Favorability. SD = standard deviation.

⁺ $p < 0.10$,

* $p < 0.05$

Table 2
Effects of Maternal Behaviors on Emerging Adults' Alcohol Use among the Full Sample (N = 686)

Predictor:	Model 1 Main Effects				Model 2 Interactions			
	W4 Prototype		W5 Alcohol Use		W4 Prototype		W5 Alcohol Use	
	β	[95% CI]	SE	β	[95% CI]	SE	β	[95% CI]
SES	.15***	[.08, .23]	.04	.08*	[.01, .15]	.04	.14***	[.06, .22]
W4 Risk	.14***	[.06, .21]	.04	.05	[-.03, .13]	.04	.14***	[.06, .21]
Age	.06	[-.01, .14]	.04	.02	[-.06, .10]	.04	.06	[-.02, .14]
Female	.01	[-.06, .09]	.04	-.13***	[-.21, -.05]	.04	.01	[-.06, .09]
W3 Alcohol Use	-.03	[-.11, .05]	.04	.11*	[.02, .19]	.05	-.03	[-.11, .04]
W3 Prototype	.22***	[.14, .30]	.04	.17***	[.08, .26]	.05	.23***	[.14, .31]
W4 Prototype	---	---	.05	.15***	[.06, .24]	.05	---	---
W4 PC Rules	-.11**	[-.19, -.03]	.04	.01	[-.09, .10]	.05	-.11**	[-.19, -.03]
W4 PC Comm	.05	[-.03, .13]	.04	.01	[-.08, .10]	.04	.05	[-.12, .05]
W4 PC Warmth	.10**	[.03, .17]	.04	.01	[-.07, .08]	.04	.10**	[.02, .17]
W4 PC Supervision	-.09*	[-.17, -.01]	.04	-.06	[-.14, .03]	.04	-.10*	[-.18, -.02]
W4 PC Alc Use	-.01	[-.09, .06]	.04	.08*	[-.01, .16]	.04	-.01	[-.08, .07]
Alc Use $\times$ Rules							.04	[-.04, .13]
Alc Use $\times$ Comm							-.04	[-.12, .05]
Alc Use $\times$ Warmth							-.01	[-.07, .06]
Alc Use $\times$ Super							.02	[-.06, .10]
R ² Value		.15					.16	.17

* Note: CI = bias corrected confidence interval based on 5,000 bootstrap samples. Risk = Risk-Taking Tendency; Rules = Alcohol-related rules; Comm = Alcohol-related communication; Super = Supervision. $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 3
Parameter Estimates for the Effects of Maternal Behaviors on Emerging Adults' Alcohol Use among Daughters (N = 376)

Predictor:	Model 1 Main Effects					Model 2 Interactions				
	W4 Prototype		W5 Alcohol Use			W4 Prototype		W5 Alcohol Use		
	β	[95% CI]	SE	β	[95% CI]	SE	β	[95% CI]	SE	β
SES	.16**	[.05, .26]	.05	.03	[-.07, .14]	.05	.14**	[.06, .21]	.06	.02
W4 Risk	.14*	[.03, .25]	.06	.10	[-.02, .21]	.06	.14*	[.06, .21]	.05	.11
Age	.08	[-.02, .18]	.05	.04	[-.07, .15]	.06	.08	[-.02, .14]	.05	.04
W3 Alcohol Use	-.12*	[-.23, -.004]	.06	.14*	[.01, .27]	.07	-.12*	[-.11, .04]	.06	.12
W3 Prototype	.23***	[.12, .33]	.05	.15*	[.02, .27]	.06	.23***	[.14, .31]	.06	.16*
W4 Prototype	---	---	.13*	.13*	[.004, .25]	.06	---	---	.12	.12
W4 PC Rules	-.15*	[-.26, -.04]	.06	.03	[-.09, .15]	.06	-.14*	[-.19, -.03]	.06	.04
W4 PC Comm	.10	[-.01, .22]	.06	.00	[-.11, .12]	.06	.11	[-.12, .05]	.06	-.01
W4 PC Warmth	.05	[-.04, .14]	.04	.01	[-.09, .12]	.05	.05	[.02, .17]	.05	.00
W4 PC Supervision	-.17**	[-.27, -.06]	.05	-.03	[-.15, .07]	.06	-.18***	[-.18, -.02]	.06	-.03
W4 PC Alc Use	.05	[-.04, .14]	.05	.08	[-.02, .18]	.05	.05	[-.08, .07]	.05	.12*
Alc Use $\times$ Rules							.00	[-.04, .13]	.05	.10
Alc Use $\times$ Comm							-.08	[-.12, .05]	.06	-.08
Alc Use $\times$ Warmth							.03	[-.07, .06]	.04	.14***
Alc Use $\times$ Super							.00	[-.06, .10]	.07	-.08
R ² Value		.20			.14			.20		.17

Note: CI = bias corrected confidence interval based on 5,000 bootstrap samples. Risk = Risk-Taking Tendency; Rules = Alcohol-related rules; Comm = Alcohol-related communication; Super = Supervision.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$

Table 4
Parameter Estimates for the Effects of Maternal Behaviors on Emerging Adults' Alcohol Use among Sons (N = 310)

Predictor:	Model 1 Main Effects					Model 2 Interactions				
	W4 Prototype		W5 Alcohol Use			W4 Prototype		W5 Alcohol Use		
	β	[95% CI]	SE	β	[95% CI]	SE	β	[95% CI]	SE	β
SES	.15**	[.04, .26]	.06	.14*	[.02, .25]	.06	.18**	[.06, .29]	.06	.14*
W4 Risk	.12*	[.01, .22]	.05	-.01	[-.13, .11]	.06	.11*	[.002, .20]	.05	-.02
Age	.02	[-.09, .13]	.05	-.02	[-.15, .13]	.07	.02	[-.09, .12]	.05	-.02
W3 Alcohol Use	.08*	[.01, .16]	.04	.06	[-.07, .18]	.07	.07	[-.01, .15]	.04	.06
W3 Prototype	.24***	[.12, .36]	.06	.19**	[.05, .33]	.07	.24***	[.11, .36]	.06	.20**
W4 Prototype	---	---	---	.19**	[.06, .33]	.07	---	---	---	.20**
W4 PC Rules	-.04	[-.17, .08]	.06	-.05	[-.21, .12]	.09	-.06	[-.19, .06]	.06	-.05
W4 PC Comm	-.04	[-.15, .08]	.06	.00	[-.14, .13]	.07	-.03	[-.15, .08]	.06	-.01
W4 PC Warmth	.18**	[.06, .30]	.06	.03	[-.10, .15]	.06	.19**	[.07, .31]	.06	.03
W4 PC Supervision	-.03	[-.15, .09]	.06	-.10	[-.22, .04]	.07	-.02	[-.15, .09]	.06	-.10
W4 PC Alc Use	-.12*	[-.23, -.004]	.06	.08	[-.06, .23]	.07	-.15*	[-.29, -.02]	.07	.09
Alc Use $\times$ Rules							.19**	[.06, .32]	.07	.03
Alc Use $\times$ Comm							.02	[-.14, .15]	.07	-.05
Alc Use $\times$ Warmth							-.02	[-.18, .12]	.08	-.01
Alc Use $\times$ Super							.05	[-.07, .16]	.06	-.07
R ² Value		.17			.17			.22		.18

Note: CI = bias corrected confidence interval based on 5,000 bootstrap samples. Risk = Risk-Taking Tendency; Rules = Alcohol-related rules; Comm = Alcohol-related communication; Super = Supervision.

* $p < 0.05$,

** $p < 0.01$,

*** $p < 0.001$