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A Moderated Mediation Model of Parent–Child Communication, Risk Taking, Alcohol Consumption, and Sexual Experience in Early Adulthood

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Abstract

The relationship between risk-taking personality and health-risk behaviors has been widely established, where people who like to take risks are more likely to engage in risky sexual behaviors such as having multiple casual partners and having unprotected sex. Drawing on a national U.S. sample from the National Longitudinal Study of Adolescent to Adult Health, the present study examined the relationship between risk-taking personality and sexual experience among adults in early adulthood, and the role of family (parent–child) communication in moderating this relationship. Findings indicated that, for both males and females, the effect of risk taking on sexual experience through alcohol use dissipated at high levels of father–child communication. However, mother–child communication did not have such moderating effects. Implications for the way in which we study parent–child communication are discussed.

Keywords Risk taking · Parent–child communication · Sexual behavior · Alcohol use

Introduction

A key question in social science research addresses why and how individuals engage in risky behaviors. The literature in this area suggests that engagement in risky behaviors is determined by individual, interpersonal, environmental, and situational factors (Kotchick, Shaffer, Miller, & Forehand, 2001). For example, in the context of risky sexual experience, both individuals' risk-taking personality traits (Schmitt, 2004) and social environments (Brown & Vanable, 2007) are known as major determinants of risk taking. Building on past research, the present study proposes and tests a model of risky behavior that includes individuals' risk taking and communication patterns within family. Specifically, we examine how risk-taking personality leads to alcohol consumption, which in turn leads to risky sexual experiences. In addition, we explore whether family communication moderates the link between

risk taking and risky sexual behaviors. Understanding how individuals' risk taking and the pattern of family communication jointly operate can provide new insights into why risky sexual behaviors occur and how to prevent them.

The current study focuses on early adulthood (defined as 24–34 years of age), an understudied age group. Prior research has largely focused on adolescent and emerging adult populations because they engage in high rates of risky behaviors including substance abuse and sexual activity. Research findings suggest that risk-taking personality traits among adolescents are a key predictor of risky sexual behaviors such as having multiple casual partners and having unprotected sex (Birthrong & Latzman, 2014). Other work also indicates that parent–child communication plays an important role in risky behaviors for adolescents (Hutchinson, Jemmott, Jemmott, Braverman, & Fong, 2003; Nash, McQueen, & Bray, 2005). However, while adolescent-aged children are at the highest risk of negative consequences from risky sexual behaviors including sexually transmitted infections (STIs) and unwanted pregnancy (Center for Disease Control and Prevention, 2014), adults still face a considerable amount of sex-related risks. For early adults, the incidence rate of chlamydia was over five times higher in 2013 than in 1996 (Minnesota Department of Health, 2016). For both men and women, uncommitted sexual encounters have

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become more socially acceptable (Garcia, Reiber, Massey, & Merriwether, 2012), and nationally representative data show that many have reported not using condoms (Reece et al., 2010). Given this, while adolescence continues to be a critical cohort in which to study sexual health, it is still of importance to study adult populations, especially those in the early adulthood stage. This population group is active in sexual activities but also exposed to a great deal of sex-related risks. Despite the centrality of family relationships throughout one's lifetime (Bucx & van Wel, 2008), empirical research on parent–child communication at this stage of adulthood is virtually nonexistent. Recognizing the dearth of research for this cohort of adulthood, the current study aims to determine whether the relationship between risk-taking personality and sexual experience replicates for the young adult population, investigate the mediating mechanism of the relationship via alcohol consumption, and finally examine whether and how parent–child communication moderates this relationship.

Risk-Taking Personality and Risky Behaviors

Risk-taking personalities crave varied, novel, and intense experiences (Bardo, Donohew, & Harrington, 1996). They are also characterized by a willingness to take social and legal risks and a difficulty in delaying gratification (Worthy, Jonkman, & Blinn-Pike, 2010; Zuckerman & Kuhlman, 2000). The concept of risk taking has been studied in conjunction with other traits such as sensation seeking and impulsivity (e.g., Cooper, 2002; Donohew et al., 2000; Zuckerman & Kuhlman, 2000), which are also associated with a tendency to seek new experiences and be more receptive to arousing stimuli than people who do not exhibit this trait (Stanford et al., 2009). Notably, risk taking has been established as a predictor for engaging in risky behaviors such as alcohol consumption and risky sexual behavior. For example, one study found that high levels of risk taking at age 18 were related to alcohol use in adulthood (Merline, Jager, & Schulenberg, 2008). In addition, impulsive decision-making was associated with a variety of sexual risk behaviors (Charnigo et al., 2013).

Cognitive psychologists have attributed these outcomes to the way in which risk-taking individuals perceive the level of risk associated with certain actions (see Ingra & Irwin, 1996). Adolescent risk perception theory explains the association between risk taking and the enactment of risky behaviors: People exhibiting risk-taking personality have been found to report lower levels of perceived risk and danger than those not exhibiting the personality trait (Boyer, 2006). When assessing a situation that involves both positive and negative consequences (for example, deciding whether to have sex or deciding whether to use protection), these personality types are likely to minimize the perceived level of risk associated

with a situation. It should be noted that people may simultaneously be aware of the risks without feeling personally vulnerable. Interestingly, one study found that sensation-seeking individuals were aware of the risk of HIV when engaging in unprotected sex, but chose to engage in risky sexual behavior acknowledging these risks (Horvath & Zuckerman, 1993).

Ingra and Irwin (1996) describe adolescents in particular as being “optimistically biased” and having the perception that they are “invulnerable” to any negative consequences of risky behaviors. However, longitudinal studies suggest that the risk-taking personality trait remains stable over time (Roberti, 2004). Given these findings, we expect that risk-taking personality will positively predict sexual risk behaviors during early adulthood.

H1 Participants exhibiting increased risk-taking personality will have more sexual experience in early adulthood.

Alcohol Use and Sexual Behavior

Research has supported the notion that drinking encourages risky sexual behavior. People who are under the influence are more likely to decide to have sex and are more likely to have sexual relationships with multiple partners on a casual basis (Benotsch, Snipes, Martin, & Bull, 2013). In addition, alcohol has been associated with the decision to have unprotected sex (Kiene, Barta, Tennen, & Armeli, 2009).

In order to explain the connection between alcohol consumption and increased likelihood of engaging in sex, Steele developed the alcohol myopia theory (AMT; Steele, Critchlow, & Liu, 1985; Steele & Josephs, 1990; Steele & Southwick, 1985). When people are deciding whether or not to engage in a behavior, both impelling and inhibiting cues are present and both factor into the decision-making process. Impelling cues highlight the advantages of enacting the behavior, while inhibiting cues emphasize the disadvantages. AMT assumes that alcohol causes a reduction in people's attentional capacity such that the available attentional resources are used for processing and understanding the most salient stimulus in their environment. Further, intoxicated individuals are likely to focus on their impelling cues over inhibiting cues (Mocai-ber et al., 2011). Therefore, when intoxicated individuals are deciding whether to engage in sex, they are more likely to think about the benefits of sex, as opposed to the possible costs such as pregnancy, contracting an STI, or possible negative social or emotional consequences. In support of this, a recent meta-analysis concludes that the causal link between alcohol consumption and risky sexual outcomes is well established (Scott-Sheldon, Carey, Cunningham, Johnson, & Carey, 2016). Thus, we predict that alcohol use will mediate the relationship between risk taking and sexual experience, or number of sexual partners. Specifically, participants with high levels

of risk taking will increase the likelihood of alcohol use, and increased alcohol use will result in more sexual experience.

H2 Alcohol use will mediate the effect of risk-taking personality on sexual experience.

The Influence of Parent–Child Communication on Risky Behaviors

While many believe that parents would play a minimal role in their children’s lives in adulthood, current trends in parent–child living arrangements indicate otherwise. Unlike the previous generation of baby boomers who tended to move out of their parents’ homes after graduating from high school or college, recent studies have found that 32% of adults aged 18–34 years old are currently living with their parents, which is more than any other living arrangement (Pew Research Center, 2016). This trend has been shown to have positive implications for parent–child interactions and relationships. For example, 67% of parents whose adult children live at home said that they felt close to their child emotionally. The parent–child ties, social and psychological, which increasingly continue into early adulthood may speak to the possibility of parental influence on young adults.

The relationship between parent–child communication and alcohol use is one that deserves attention. Parents tend to underestimate their influence on their children’s lives starting from the time they leave home for college (Turrisi, Wiersma, & Hughs, 2000), but research has shown that parents can have an influence on their children’s health behaviors (Bahr & Hoffmann, 2010). In one study, a positive family environment, which was characterized by parent–child communication and parental monitoring, was negatively associated with alcohol and other substance use (Nash et al., 2005). It is also possible that parents may be more influential than peers regarding their children’s alcohol and substance abuse (Kelly, Comello, & Hunn, 2002; Nash et al., 2005). In particular, increased openness in parent–child communication reduces the risk of unhealthy alcohol abuse (Brody, Murray, Kim, & Brown, 2002). Another study found that among high school graduates, the influence of young adults’ parents moderated the influence of young adults’ peers, suggesting that a higher level of parental involvement mitigates the influence of peer pressure to consume alcohol (Wood, Read, Mitchell, & Brand, 2004).

The influence of parent–child communication on risky sexual behavior has also been shown to be more effective than previously thought (Hutchinson et al., 2003). Although again the emphasis of this area of research is on adolescent-aged subjects, young adults’ attitudes about sex and sexual health can be a product of parental supportiveness (Parkes, Henderson, Wight, & Nixon, 2011) and parent–child communication (Hutchinson et al., 2003). However, empirical

studies examining the parent–child relationship as a predictor of sexual behavior have yielded mixed findings. For example, parental monitoring has been linked to later ages of sexual initiation (Parkes et al., 2011). Greater amounts of parental involvement also led to an increase in communication about sexual risk and comfort with risk-related conversations (Aronowitz, Rennells, & Todd, 2005). In contrast, Somers and Paulson (2000) found that parental closeness did not significantly influence participants’ sexual behavior. Given the inconsistent findings about how high levels of parental involvement may influence children’s engagement in risky behaviors, we are left with an important question about the moderating role of parent–child communication on sexual experience in early adulthood (see Fig. 1).

RQ What is the nature of the influence of parent–child communication on the effects of risk-taking personality on sexual experience through alcohol use?

Method

Participants and Procedure

Data from this study were taken from Wave IV of the National Longitudinal Study of Adolescent and Adult Health (Add Health). This nationally representative data were collected over 2008 and 2009 using original respondents from the first wave collected in 1994–1995. Participants ($n = 5114$, 2353 males) were located across the U.S. with all 50 states represented, ranging from 24 to 32 years old ($M = 29$ years old, $SD = 1.78$). They identified as 71.9% White ($n = 3671$), 24.2% Black or African American ($n = 1240$), .8% American Indian or Alaskan Native ($n = 41$), 3.1% Asian or Pacific Islander ($n = 157$), and .1% did not specify ($n = 5$). Missing cases were handled with listwise deletion. Questionnaire items were measured during a computer-assisted personal interview; however, more sensitive questionnaire items were measured using a computer-assisted self-interview. For more

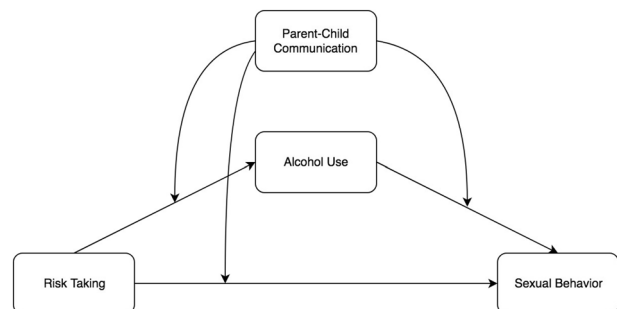


Fig. 1 Conceptual model of hypothesized moderated mediation

information about the sampling design, please visit <http://www.cpc.unc.edu/projects/addhealth/design>.

Measures

Sexual Experience

Participants' sexual experience was measured with their number of sexual partners. Participants were asked to list their total number of sexual partners. Data show that 10.8% of participants indicated having one sexual partner ($n = 552$), 49.9% indicated having 2–10 partners ($n = 2553$), 15.4% indicated having 11–20 partners ($n = 790$), 12.7% indicated having 21 or more partners ($n = 649$), 2.7% indicated “don't know” ($n = 137$), and 8.5% skipped or refused to answer the question ($n = 433$). On average, males reported having sexual intercourse with 15.95 partners ($SD = 27.98$) and females reported 9.53 partners ($SD = 13.33$). Overall, participants had an average of 12.4 sexual partners ($SD = 21.41$) at the time the survey was conducted.

Risk Taking

Risk taking was measured by a single item. Participants were asked to rate on a Likert-type scale the degree to which they “like to take risks” (1 = *strongly disagree* to 5 = *strongly agree*). Relatively similar proportions of participants agreed, or liked taking risks ($n = 1809$, 35.5%) and disagreed, or disliked taking risks ($n = 1899$, 37.2%), and 27.3% reported that they neither agreed nor disagreed ($n = 1394$) (total $n = 5102$, $M = 2.98$, $SD = 1$).

Alcohol Use

Alcohol use was measured considering the frequency of alcohol consumption by asking participants, “During the past 30 days, on how many days did you drink?” Responses ranged from 0 = *none* to 6 = *every day or almost every day*. Participants reported an average of 2.3 ($SD = 1.71$), which equates to 2–3 days out of the month.

Parent–Child Communication

Parent–child communication was measured by three items (i.e., frequency, satisfaction, and closeness), each listed for both the mother figure and father figure for a total of six items. These items were completed by the participant about his or her relationships with parents. This multi-dimensional approach allows us to capture both frequency and quality of parent–child communication. To measure frequency of communication, participants were asked how often they and their mother/father figure talk on the telephone, exchange letters, or exchange email (1 = *once a year or less* to 5 = *almost*

every day). To measure communication satisfaction, participants were asked how satisfied they were with the way they and their mother/father figure communicate with each other (1 = *strongly disagree* to 5 = *strongly agree*). To measure parent–child closeness, participants were asked how close they feel with their mother/father figure (1 = *not at all close* to 5 = *very close*).

With these items, our first task was to develop a reliable measure for the latent concept of parent–child communication and to determine whether we should analyze both parents together as one unit, or as separate units. To accomplish this, we performed an exploratory factor analysis using the six manifest variables associated with parent–child communication, followed by a direct oblimin rotation. The pattern matrix indicated a two-factor solution explaining 68% of the variance. The factors reflected mother–child communication and father–child communication as two separate factors. We then tested the two factors and their respective three items on their reliability. Internal consistency was determined using Cronbach's alpha. Both mother–child communication ($\alpha = .72$) and father–child communication ($\alpha = .79$) exceeded the minimum recommendations for reliability. Since all items were measured on a 1 to 5 scale, we created a mean composite measure of mother–child communication and father–child communication. Our composite measure of mother–child communication, which ranged from 1 to 5, yielded an average score of 4.41 ($SD = .72$), while father–child communication yielded an average of 3.95 ($SD = .99$).

Results

For Hypothesis 1, we examined whether risk-taking personality was positively related to sexual experience for people in early adulthood. To test this relationship, a regression equation was specified in which sexual experience was regressed on risk-taking personality and a set of basic demographics (i.e., age, race, level of education) that was considered for control purposes. The regression analysis supported the hypothesis, revealing that risk-taking personality trait significantly predicted the number of sexual partners ($b = 3.06$, $SE = .31$, $p < .001$). That is, respondents exhibiting higher levels of risk-taking personality tend to have more sexual experience, and this pattern of relationship holds regardless of the inclusion of control variables.

Although not the focus of this study, some findings about the control variables are worth briefly noting. First, the analysis finds that participants' alcohol use was significantly associated with race ($b = -.10$, $SE = .04$, $p = .014$). To understand these effects, we dummy coded each race and tested their influence on alcohol use using univariate ANOVA, which indicated that Caucasian participants consume significantly more alcohol than non-Caucasian participants ($F[1,$

3360] = 6.20, SE = .06, $p = .013$). Alcohol use was not significantly associated with age ($b = .01$, SE = .01, $p = .449$), or level of education ($b = .03$, SE = .042, $p = .457$). Participants' sexual experience was negatively associated with level of education ($b = -1.27$, SE = .42, $p = .003$). A univariate ANOVA revealed that African American participants had significantly more sexual experience than non-African American participants ($F[1, 4539] = 36.85$, SE = .06, $p = .013$). Sexual experience was not significantly associated with age ($b = -.14$, SE = .17, $p = .416$) or race ($b = .73$, SE = .49, $p = .134$).

Furthering the baseline relationship described above, Hypothesis 2 predicted that alcohol use would mediate the effect of risk-taking personality on sexual experience. To test this hypothesis, we conducted a mediation analysis using PROCESS, a modeling tool specialized for testing mediation and moderation (Hayes, 2013), with risk taking as the independent variable, alcohol use as the mediating variable, and sexual experience as the dependent variable (Model 4 in PROCESS). The same set of demographic variables was employed as in the regression model testing H1. Consistent with H2, the results indicate that alcohol use mediated the effect of risk-taking personality on sexual experience, such that participants with higher levels of risk-taking personality consumed alcohol use more than others ($b = .22$, SE = .02, $p < .001$), and frequent use of alcohol led to more sexual experiences ($b = 1.62$, SE = .21, $p < .001$). A formal testing of the two-step mediation process supported H2, suggesting that alcohol consumption significantly mediated the effect of risk-taking personality on sexual experience (*indirect effect* = .32, bootstrapped SE = .08, CI = .21–.49).

Last, in order to investigate our research question regarding the role of parent–child communication in the mediation model tested above, we conducted a moderated mediation analysis using PROCESS (Hayes, 2013, Model 59), and 95% bias-corrected bootstrapped confidence interval (CI) based on 10,000 bootstrap samples (see Fig. 1 for the full conceptual model). This analysis tested the independent moderating effects of mother–child communication and father–child communication, compared to parent–child communication, as indicated by our factor analysis. We also created separate models for male and female participants as evidence suggests that the nature of parent–child communication and the effects of parent–child communication can vary based on the child's sex (Nolin & Peterson, 1992). In our first set of analyses, mother–child communication was the moderating variable. For males, the direct effect of risk taking on sexual experience was significant at all levels (i.e., $M - 1SD$, M , and $M + 1SD$) of mother–child communication ($b = 4.05$, SE = .93, $p < .001$, CI = 2.23–5.87 at the lowest level; $b = 3.69$, SE = .66, $p < .001$, CI = 2.39–5.00 at the mean level; $b = 3.34$, SE = .90, $p < .001$, CI = 1.57–5.12 at the highest level). This suggests that the overall effect of

risk taking on sexual experience for male respondents was significant regardless of mother–child communication. When the effects of risk taking on sexual experience were mediated by alcohol use, the indirect effect of risk taking was not significant at the highest level of mother–child communication ($b = .09$, SE = .08, CI = $-.01$ to .33), but it became significant when mother–child communication was lower ($b = .13$, SE = .09, CI = .004–.40 at the lowest level; $b = .11$, SE = .06, CI = .02–.27 at the mean level) (see Table 1). This finding suggests that mother–child communication diminished the effect of risk taking on sexual experience particularly when it occurred through alcohol consumption.

For females, similar to the results for males, the direct effect of risk taking on sexual experience remained significant at all levels of mother–child communication ($b = 1.77$, SE = .51, $p = .001$, CI = .78–2.76 at the lowest level; $b = 1.57$, SE = .35, $p < .001$, CI = .89–2.26 at the mean level; $b = 1.42$, SE = .43, $p = .001$, CI = .57–2.27 at the highest level). Thus, as observed for males, mother–child communication did not moderate the overall effects of risk taking on sexual experience for females. In addition, the indirect effect of risk taking on sexual experience through alcohol use was significant at all levels of mother–child communication ($b = .14$, SE = .07, CI = .04–.33 at the lowest level; $b = .19$, SE = .06, CI = .10–.34 at the mean level; $b = .23$, SE = .08, CI = .11–.43 at the highest level) (see Table 1). This suggests that mother–child communication does not have a significant influence on the pattern of mediation (risk taking > alcohol use > sexual experience) for females.

The second set of moderated mediation analyses used father–child communication as the moderating variable. For males, the direct effect of risk taking on sexual experience

Table 1 Effects of risk taking on sexual experience through alcohol use moderated by mother–child communication

	Indirect effects of risk taking on sex via alcohol use			
	<i>b</i>	SE	LL BCA	UL BCA
<i>Males</i>				
Low M–C communication ($M - 1SD$)	.13*	.09	.004	.40
Mean M–C communication (M)	.11*	.06	.02	.27
High M–C communication ($M + 1SD$)	.09	.08	-.01	.33
<i>Females</i>				
Low M–C communication ($M - 1SD$)	.14*	.07	.04	.33
Mean M–C communication (M)	1.57*	.35	.89	2.26
High M–C communication ($M + 1SD$)	1.42*	.43	.57	2.27

* $p < .05$, LL BCA and UL BCA = lower level and upper level bias corrected and accelerated confidence intervals for $\alpha = .05$

remained significant at all levels of father–child communication ($b = 4.07$, $SE = 1.02$, $p < .001$, $CI = 2.08–6.06$ at the lowest level; $b = 3.62$, $SE = .74$, $p < .001$, $CI = 2.18–5.06$ at the mean level; $b = 3.18$, $SE = 1.00$, $p = .002$, $CI = 1.20–5.15$ at the highest level). That is, for males, risk taking led to sexual experience regardless of the level of father–child communication. When the effects of risk taking on sexual experience were mediated by alcohol use, the indirect effect of risk taking was not significant at the highest level of father–child communication ($b = .09$, $SE = .09$, $CI = -.03$ to $.43$). However, the indirect effect was significant when father–child communication was lower ($b = .20$, $SE = .12$, $CI = .02–.54$ at the lowest level; $b = .15$, $SE = .09$, $CI = .03–.40$ at the mean level) (see Table 2). This indicates that the effect of risk taking on sexual experience through alcohol consumption was lessened for males when father–child communication was high.

For females, the direct effect of risk taking on sexual experience remained significant at all levels of father–child communication ($b = 1.68$, $SE = .50$, $p = .001$, $CI = .71–2.65$ at the lowest level; $b = 1.72$, $SE = .35$, $p < .001$, $CI = 1.03–2.41$ at the mean level; $b = 1.76$, $SE = .49$, $p = .001$, $CI = .80–2.271$ at the highest level). Thus, as seen for males, father–child communication did not condition the overall impact of risk taking on sexual experience for females. When alcohol use mediated the effects of risk taking on sexual experience, the indirect effect was significant only at the mean level of father–child communication ($b = .15$, $SE = .06$, $CI = .07–.29$). The indirect effect was no longer significant at the lowest level ($b = .14$, $SE = .10$, $CI = -.02–.37$) and at the highest level of father–child communication ($b = .08$, $SE = .08$, $CI = -.06$ to $.24$) (see Table 2). As indicated by the size of indirect relationship, the effect of risk taking on sexual experience

via alcohol use was reduced for females as father–child communication was high.

Discussion

From this nationally representative data set, we have learned that the relationship between early adults' risk-taking personalities and their sexual experience is more complex than normally expected. To our knowledge, this is the first study to examine risk-taking personality in conjunction with parent–child communication, while considering the mother and father independently, to predict sexual experience. Our findings show that risk-taking personality positively and significantly predicted sexual experience. Alcohol use mediated this relationship, such that individuals exhibiting higher levels of risk taking were more likely to consume alcohol, and those who frequently consumed alcohol were more likely to have a higher number of sexual partners than those who consumed alcohol less frequently. This finding supports a large body of research that connects risk taking and sexual behavior. Risk taking has been observed as early as childhood, persisting into adulthood (Caspi, Dickson, & Dickson, 1997). While this construct has been studied in the mid-20s age group (Hendershot, Stoner, George, & Norris, 2007), our additional support for this model for early adulthood provides external validity for associations typically examined among adolescents.

Moving beyond individual-level models of predicting sexual experience, we tested the role of parent–child communication in the effects of risk taking on sexual experience. Our data revealed that parent–child communication mattered. Specifically, we found that, for males and females, the effect of risk taking on sexual experience through alcohol use dissipated at high levels in father–child communication. However, mother–child communication did not mitigate those effects for females as it did for males. This was a surprising finding considering previous research that suggests that more sex-based communication occurs between children and their mothers than children and their fathers (Dilorio, Kelley, & Hockenberry-Eaton, 1999). In addition, mothers have been found to be the primary provider of sexual information to their children compared to fathers (Helpren, 1983; Warren & Neer, 1988). However, Nolin and Peterson (1992) suggest that fathers engage more in discussions about sociosexuality and family values in the context of sexual relationships. Both empirical and theoretical research examining the importance of parent–child relationships in health-risk behaviors has considered both parents as one entity (e.g., Blake, Simkin, Ledsky, Perkins, & Calabrese, 2001; Ennett, Bauman, Foshee, Pemberton, & Hicks, 2001; Harakeh, Scholte, Vermulst, de Vries, & Engels, 2004; Holtzman & Rubinson, 1995; Huebner & Howell, 2003), by asking the participant

Table 2 Effects of risk taking on sexual experience through alcohol use moderated by father–child communication

	Indirect effects of risk taking on sex via alcohol use			
	<i>b</i>	SE	LL BCA	UL BCA
<i>Males</i>				
Low F–C communication (<i>M</i> – 1SD)	.20*	.12	.02	.54
Mean F–C communication (<i>M</i>)	.15*	.09	.03	.40
High F–C communication (<i>M</i> + 1SD)	.09	.09	–.003	.43
<i>Females</i>				
Low F–C communication (<i>M</i> – 1SD)	.14	.10	–.02	.37
Mean F–C communication (<i>M</i>)	.15*	.06	.07	.29
High F–C communication (<i>M</i> + 1SD)	.08	.08	–.06	.24

* $p < .05$, LL BCA and UL BCA = Lower level and upper level bias corrected and accelerated confidence intervals for $\alpha = .05$

general questions about communication with his or her parents without accounting for differences between parents. Further, because mothers typically assume the responsibility of having more discussions on sexual education than fathers, fathers may even be excluded entirely from analyses on the effects of parent–child communication (e.g., Hutchinson et al., 2003). Such practices may be problematic given our findings that mothers and fathers do not necessarily have the same influence on males and females. Future research should conduct more in-depth analyses on the differences between mother–child and father–child relationships regarding their influence on sexual behavior for both sexes. Father–child communication should also receive more attention than it has in the past concerning the nature of influence on risky decision-making processes.

On a related note, the finding that parent–child communication mattered illuminates the complex interactions between personality traits and social and environmental factors when assessing risky sexual behaviors. First of all, the overall effect of risk-taking personality on sexual experience was robust at all levels of parent–child communication. That is, risk taking itself was a stable and strong predictor of sexual experience regardless of parent–child communication. However, part of the overall (total) effect was found to operate through alcohol consumption, and the indirect effect of risk taking via alcohol use was then reduced by parent–child communication. These findings contribute to a more nuanced understanding of the mechanisms underlying risky behaviors. Personality factors account for individuals' risky behaviors not only independently but also jointly with social and environmental factors. Moreover, the results suggest that parent–child communication can play a role in alleviating sex-related risks. The outcomes or risks from sexual experience would likely be more serious especially when alcohol consumption connects risk-taking personality to sexual experience. If, as observed in this study, parent–child communication can reduce the effect of risk taking on sexual behaviors that occurs through alcohol use, parent–child conversations might be able to lower the possibility for the child to face high risks that are often found in alcohol-driven sex.

This study is not without limitations. First, the use of public data for the current study prevented us from examining specific topics communicated in “close” parent–child relationships. Though statistically significant findings emerged from our model, we were unable to determine whether the parent–child communication described in our sample involved any discussions of sex-related issues, and whether these discussions occurred during or after adolescence. Second, and also due to the use of secondary data, we were restricted to measuring risk-taking personality with a single-item measure. Instruments have been developed to measure risk taking and conceptually similar constructs, including Kalichman et al.'s (1994) General

Sensation-Seeking Scale and the Impulsive Unsocialized Sensation Seeking subscale of the Zuckerman-Kuhlman Personality Questionnaire (Zuckerman, Kuhlman, Joireman, Teta, & Kraft, 1993). Although single-item measures have been shown to effectively measure certain psychological constructs (Robins, Hendin, & Trzesniewski, 2001), future research examining these variables with this cohort of adults should incorporate more detailed scale measurements.

Despite these limitations, our findings provide a foundation for future research examining the influence of parents on their children's sexual behavior. One potential avenue for future research is to look at the *content* side of parent–child communication. Studying whether content features in parent–child discussion (e.g., topics, style, type, depth of discussions) shape young adult children's risky behaviors would help us more fully understand the role played by the communicative interactions between parent and child. Furthermore, this could be done ideally with a longitudinal design in which the dynamics of parent–child interaction in terms of amount, form, and content are observed multiple times. Such a method would allow researchers to assess parental influence as both parents and children grow and also their relationship evolves into different stages, with more confidence about the causal direction among parent–child communication, risk taking, and sexual behavior. A study of this nature may serve to inform parents about the conditions under which their communication is most effective. Future research should also consider whether the moderating role of parent–child communication replicates for other risky behaviors, such as drug use and unprotected sex.

To conclude, given what we know about risk-taking individuals, it is important to develop a means of disseminating sexual health information into adulthood that caters to their needs and interests. Donohew et al. (2000) recommend that information should be delivered with increased “novelty and excitement,” and in such a way that reduces impulsive decision-making. Attributes of such interventions can then be applied to promoting a high level of communication between parents, especially fathers, and their children on sex-related topics.

Compliance with Ethical Standards

Conflict of interest The authors declare that they have no conflict of interest.

Ethical Approval For this type of study, formal consent is not required. The current study uses public data from the National Longitudinal Study of Adolescent to Adult Health (Add Health) and therefore does not currently rely on human participation. More information on how the data were initially collected is described in this paper, and can also be found at <http://www.cpc.unc.edu/projects/addhealth>.

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