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The Competition-Violence Hypothesis: Sex, Marriage, and Male Aggression*

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Abstract

Sexually active men, who are not in a monogamous relationship, may be at a greater risk for violence than men who are sexually active within monogamous relationships and men who are not sexually active. The current study examines changes in sexual behavior and violence in adolescence to early adulthood. Data on male ($n = 4,597$) and female ($n = 5,523$) respondents were drawn from four waves of the National Longitudinal Study of Adolescent and Adult Health (Add Health). HLM regression models indicate that men who transition to a monogamous, or less competitive, mode of sexual behavior (fewer partners since last wave), reduce their risk for violence. The same results were not replicated for females. Further, results were not accounted for by marital status or other more readily accepted explanations of violence. Findings suggest that competition for sex be further examined as a potential cause of male violence.

Introduction

Since its publication, Sampson and Laub's (1990) landmark study of previously incarcerated males has generated a flurry of research on marriage and crime. This research generally finds that after men marry they report less criminal behavior, are less likely to be arrested or incarcerated, and are less involved with drugs and deviant peer groups (see Blokland and Schipper, 2016 for a recent review). Marriage also demands of men that they no longer compete against one another for sexual partners, which historically has been a source of male aggression and continues to engender conflict (Campbell, 2005; Betzig, 1986; Buss, 2006; Keegan, 2004; van der Dennen, 1995).

The current study augments prior life course related theories (e.g., Laub and Sampson, 2003) by discussing sex, in addition to marriage, in relationship to violent behavior. While prior research shows that marriage may indeed reduce male criminal offending, there are at least two problems posed by focusing on marital unions in criminological research. The first problem is demographic. The median age of first-time marriage in the United States is about

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26 for women and 28 for men (U.S. Census Bureau, 2010). Desistence from criminal behavior, on the other hand, typically begins in mid to late adolescence (Gottfredson and Hirschi, 1990). Early marriages may reduce involvement in crime and violence (e.g., Siennick et al., 2014; Theobald and Farrington, 2010); however, this subset of unions is not statistically representative of the youth population. Furthermore, cohabitation has come to replace marriage in recent decades as the type of union many young people engage in during their early adult years (Smock, 2000; Lesthaeghe and Neidert, 2006); yet rates of violent crime have declined despite this major social change (Zimring, 2006).

A second problem, related but not specific to the research on marriage, is that most criminological studies that have examined intimate relationships among adolescents and young adults have focused heavily on the qualities of a single union (Capaldi, Hyoun, and Owen, 2008; Eklund, Kerr, Stattin, 2010; Haynie et al., 2005; Giordano et al., 2010; McCarthy and Casey, 2008). Criminologists who conduct peer research by comparison rarely focus on the influence of a single friendship, even though these dyads tend to be longer lived than dating relationships (Giordano, 2003; Warr, 2002). While this singular focus makes sense in the context of marriage and perhaps cohabitation, it is far less applicable when studying youthful populations and patterns of sexual behavior. Over the course of adolescence and early adulthood, individuals will likely experience multiple intimate relationships. Relatively high levels of sexual exclusivity and emotional attachment may characterize some of these relationships, while others may be more fleeting as well as sexually non-exclusive (Manning, Longmore, and Giordano, 2005).

The perspective brought to bear on the data is grounded in research on evolved differences between the sexes (e.g., Darwin, 1871; Buss, 2003; Puts, 2010; Trivers, 1972; Zahavi, 1975). As a general rule of sexual behavior, also known as Bateman's principle (1948), males often attempt to have sex frequently and with a variety of partners if given the opportunity, while females by comparison are more judicious in selecting partners and will reject sexual advances under a variety of circumstances, individual and cultural variation notwithstanding (Brown et al., 2009). A consequence of these divergent strategies is that males may need to compete against other males for a chance to be selected by a female. Sexual competition therefore holds the potential for violence, particularly when the romantic and sexual interests of one man are at odds with another.

Women are also competing for desirable partners, and whose choice of partners may play a significant role in the link between sex and violence. Men who show a willingness to take risks, have a high self-esteem, and a body that is physically imposing possess qualities that women may find desirable, but these qualities are also correlated with aggressive behavior (Apicella, 2014; Brewer and Howarth, 2012; Frederick and Haselton, 2007; Sell et al., 2009; Baumeister, Smart, and Boden, 1996). A broadly held preference among women for partners who embody these qualities may result in physically aggressive men being favored for sex. Thus because of female biases in mate selection, it follows that any observed link between men's sexual behavior and their involvement in violence may be explained not as a direct result of men competing, but rather as a by-product of women choosing men on the basis of qualities which happen to correlate with physical aggression.

There is also the possibility that male competition and female choice conspire to create the link between sex and violence. If aggressive behavior in men is correlated with qualities that women find desirable, all that is needed for an aggressive competition to ensue is for young women to exercise a preference for desirable men, and for men to want sex. From this perspective both genders are culpable for the link between sexual behavior and violence—men for competing against each other for sexual partners and women for choosing the most desirable competitors. Monogamy offers men an escape from this unwitting conspiracy and is therefore central to the issues being explored in the current study.

The current study integrates prior research on sexual competition and violence with findings from criminology to advance a competition-violence hypothesis. It states that sexually active men, who are not in a monogamous relationship, are in competition against other men for access to females, and when challenged by a rival, denied access by a third party, or humiliated men may seek violent retribution. Women, by selecting partners on a non-random basis, play a central role in men's competition for sex that inadvertently and disproportionately favors men who have a history of violence as well as the potential for being violent in the future. Transitioning to a monogamous, or less competitive, mode of sexual behavior may reduce men's risk for violence. The hypothesis is tested in a longitudinal sample of males and females over a period of about twelve years. The current study looks to Thomas Hobbes's (1651) principle causes of quarrel, routine activities theory (Cohen and Felson, R, 1979; Felson, M and Boba, 2009), as well as sexual selection theory (Darwin, 1871; Puts, 2010; Trivers, 1972; Zahavi, 1975) to expound on the competition-violence hypothesis.

Background

Prior evidence linking men's sexual behavior to violence can be found in research that varies in method and approach. Historians and anthropologists note that competition for wives and conflict over adulterous behavior is chief among the reasons for primitive warfare in non-state and tribal societies (Betzig, 1986; Keegan, 2004; van der Dennen, 1995). While modern governments may no longer endorse sexual jealousy as a justification for war, men's participation in violence often has a sexual motive, which is clearly present in cases of homicide throughout the industrialized world. Daly and Wilson (1988), for example, in a comprehensive analysis of homicide, conclude that sexual jealousy and competition among males are motivating factors in a large proportion of cases. Buss (2006) reports similar findings in research that asked a large sample of culturally diverse participants to describe scenarios in which they might want to kill someone (or may be killed). A reoccurring theme in the participants' narratives often concerned sex and intimate relationships in which there was infidelity, a jilted lover, and the pursuit of justice to right these wrongs. Finally, research into the social behavior of men and women in bars and nightclubs confirms what was long suspected about violence in and around these places, that incidents are especially likely to occur when the romantic and sexual interests of different parties conflict (Graham et al., 2014, 2011, 2010).

The notion that one's sexual and romantic interests may be linked to violence is also supported by research that employs experimental designs. Research conducted by Ariely and

Loewenstein (2006) suggests that when men are aroused by the prospect of a sexual encounter they may behave more aggressively toward rival males as well as female partners, lending credibility to the notion that acts of violence are experienced by perpetrators as “crimes of passion” and seem to happen in the “heat of the moment”. Ainsworth and Maner (2012) present similar findings that males, but not females, are more likely to act out in an aggressive manner towards other males after being primed by researchers to think about sexual encounters. Furthermore, Thompson et al. (2006) finds that men, after being exposed to arginine vasopressin— a peptide thought to be linked to aggression and sexual arousal in men— exhibit facial expressions that are angrier and more threatening than controls and perceive less friendliness in the faces of other men. The women in this study, by contrast, reacted to the same peptide with friendlier facial expressions and perceived less animosity in the faces of other women. Collectively, these studies suggest that situations in which men’s sexual and romantic interests are at the forefront are the very situations in which violent behavior is likely to occur.

Male Competition

While violence and the situations in which it occurs are well documented, there are no established criminological theories for linking sexual competition to observed patterns of violence. Hobbes’s (1651) principle causes of quarrel continue to be widely discussed in the literature on violence (Pinker, 2011), and because of their general applicability, they serve as a useful starting place for unpacking the competition-violence hypothesis. Consider Hobbes’s first cause of quarrel, which is in fact competition. This first cause, applied to sexual competition, may be understood from a “routine activities” perspective on crime, which is focused on the interplay of motivated offenders, suitable targets, and capable guardians (Cohen and Felson, R. 1979; Felson, M. and Boba, 2009). Here the motivated offender is a male, who targets females that he believes will be receptive to his advances. He may be blocked, however, in pursuing this goal by a guardian, who prevents his access, or by a rival male who has taken his place. If he persists despite resistance from third parties, violent confrontation may result (Parks et al., 2013).

Violence resulting from sexual competition may also be embedded within a longer timeline of events and may not be resolved in a single incident. As Buss’s (2006) research on homicide suggests, men may stew over a perceived indiscretion that kept them achieving their romantic or sexual goals, but then an opportunity arises to balance the scales of justice. In the mind of the aggrieved party, justice is achieved through violent retribution, but from the perspective of his rivals justice will not be done until this aggression is repaid in kind. This much is true of violence generally, which can produce vicious cycles of revenge, despite its initial causes being trivial and sometimes sexual in nature (Black, 1983; Harris, 2003; Kanazawa and Still, 2000; Katz, 1988; Wolfgang, Ferracuti, and Mannheim, 1967).

Hobbes’s two other principle causes of quarrel are fear and reputation. Reputation, or honor, is a re-occurring theme in the research on violence. Ethnographic descriptions of urban crime, studies on the differences in violent crime rates between northern and southern states, and historical analyses of violence all emphasize honor, and the fear of being dishonored or victimized, as a basis of male aggression (e.g., Anderson, 2000; Eisner, 2003; Elias, 1978;

Nisbett and Cohen, 1996; Ruff, 2001). Fear and reputation may also play a role in the violence that is associated with sexual competition. The injury to honor that men may feel for failing to defend a current or potential partner against the sexual advances of rival men may give rise to retaliatory violence, to restore one's reputation, as well as preemptive violence, for fear that the offense may happen again or simply to keep it from happening in the first place (Black, 1983; Felson, 1997; Mullins, Wright, and Jacobs, 2004).

Female Choice

While sexual competition may be important for explaining male aggression, female choice plays an integral role. Men who would use physical violence to gain a competitive advantage may possess other qualities that are sexually appealing to women, at least in the short-term. This much has been suggested in research by Rebellon and Manasse (2004) who found that highly delinquent males report relative success in attracting female dating partners. Rebellon and Manasse (2004) interpret these findings using a derivative of sexual selection theory known as the "handicap principle" (Zahavi, 1975). The handicap principle suggests that behaviors that are potentially costly to males—such as fighting and showing disregard for authority, but which are valued by females, perhaps for the strength and bravado they symbolize—will be implemented as tactics in male sexual competition (see also Palmer and Tilley 1995). Research on sexual selection theory also suggests that a preference for these qualities may have itself been selected for in females (Puts, 2010). This would help to explain why men have a penchant for violent behavior in the first place, in the sense that male aggression, and a preference for it among females, were selected for in the course of human prehistory.

Partnering with an aggressive and/or criminally involved male may have its advantages, especially in an unsafe environment where threats of violence are commonplace. Yet displays of dominance and physical aggression play just as well to an all male audience, who serve as a source of encouragement and validation, thereby reinforcing the behavior as well as its symbolic value in the peer culture (Messerschmidt, 1993). Furthermore, qualities in males that are correlated with aggressive behavior, such as confidence, bravado, and an athletic physique, may be attractive to women in the short-term, but in the long-term these are not necessarily the same qualities that women look for in a spouse or that would sustain a committed relationship (Buss, 2003).

Women's choice of partners is further constrained by unfavorable economic conditions which can make men less desirable as marital partners (Wilson, 2011), and the sex ratio itself (Barber, 2009; Walsh, 2003), which may contain few men relative to the number of women, thus favoring men's preference for frequent sex with a variety of partners, for which they may face competition from other men who are similarly inclined. And so without purpose or malicious intent, and while acting within the constraints of their environments, men and women conspire to make the pursuit of sex and romance a potentially violent affair.

Desistance

Desistance from sexual competition, and the violence that it produces, may require men to reassess definitions of what it means to act manly (Carlsson, 2013; Giordano, 2014; Rocque,

Posick, and Paternoster, 2016; Messerschmidt, 1993; Simons and Barr, 2014). Men, after all, do not pursue sexual opportunities endlessly as Batman's principle might suggest. Men play more conventional heterosexual roles as well, such as husband, father, and reliable partner and provider. These role transformations however, like the pro-social effect of marriage itself, may depend on the level of commitment within relationships as well as a general departure from competitive modes of sexual behavior, which may prove difficult for men who feel that long-term relationships are inaccessible because of their poor economic status and/or inexperience with stable heterosexual unions (Parker and Reckenwald, 2008). Nevertheless, prior research shows that young males commit fewer delinquent acts while in a romantic relationship with a loved partner, but sex outside of relationships increases the risk of criminal offending (McCarthy and Casey, 2008). Further, males who do not begin a new relationship shortly after breaking up with a girlfriend increase their risk of future criminal offending (Laursen and Sweeten, 2012).

The break-up effect, noted previously, may highlight that newly single males are likely competing again for female partners, possibly in high risk places, such as bars, nightclubs, and parties, where social barriers are less defined and authority figures lacking (e.g., Leonard, Quigley, and Collins, 2002; Kim, 2013; Miller, 2012; Miller et al., 2005; Osgood and Anderson, 2004; Pridemore and Grubestic, 2011). Thus, changes in men's sexual behavior may signal changes in their routine activities, and more importantly in their willingness to compete for female partners, thereby making them vulnerable to Hobbesian quarreling, selective female biases, and ultimately a greater risk of violent confrontation.

Current Study

The current study examines sexual behavior and violence in a longitudinal sample of males and females. The analyses are focused primarily on males, although results are also presented for females. The effects of sexual behavior are compared to other, more readily accepted, explanations of violence. Drug and alcohol use may increase the likelihood of violence, especially when used in social contexts such as parties and nightclubs, where relaxed social norms are paired with opportunities for males to make sexual advances (Graham et al., 2014, 2011, 2010). Childhood trauma, emotional attachment to caregivers, and local risk factors have also been shown to influence patterns of violence and risky sexual behavior (Harris, 2003; MacMillan 2001; Maimon and Browning, 2012; Widom, 2000). Retrospective reports of childhood physical and sexual abuse are controlled in the regression models, as are community levels of poverty and the proportion of unmarried males and females (Parker and Reckenwald, 2008; Porter and Purser, 2010). Emotional attachment to caregivers is controlled for in wave 1 of the data. Finally, marriage and full-time employment, which prior research suggests may deter men from criminal behavior, are controlled for in all waves (Laub and Sampson, 2003; Uggen, 2000).

The competition –violence hypothesis makes five statements that are tested in the analyses to follow:

1. Changing to a monogamous, or less competitive, mode of sexual behavior (fewer partners since last wave), reduces violence.

2. Changing to a more competitive mode of sexual behavior (multiple partners since last wave), increases violence.
3. Men with a history of violence are selected for sex more often than their less aggressive peers.
4. Both male competition and female choice contribute to the link between sex and violence.
5. The influence of sexual behavior on violence cannot be accounted for by marital status or any other more readily accepted explanation of violent behavior.

Data

The National Study of Adolescent and Adult Health (Add Health) is the data source for the current study.¹ The Add Health study is a nationally representative sample of adolescent youth containing four waves of longitudinal data. The sampling frame consisted of all high schools in the United States. A sample of 80 high schools and 52 middle schools was selected with unequal probability of selection. Respondents from grades 7 through 12 were initially surveyed during the 1994–1995 academic year. Waves 1 thru 4 of the restricted version of this dataset were used in the current study. The analytic sample includes males (n = 4,597) and females (n = 5,523) who participated in all four waves of the data. Fifty-four and one-half percent of the analytic sample is White/non-Hispanic; 19.5% African American/Black; 16% Hispanic/Latino; 7% Asian; 3% other.

Measures

Violence is measured with a 4-item index that asks respondents how often they have pulled a knife or gun on someone, seriously injured someone in a fight, gotten into a group fight, and shot or stabbed someone. These four items were selected because they appear in all waves of the data. Violence items were coded as “0” or “1” to eliminate differences in measurement and then summed to create a 5-point index, range 0–4 (see Table 1). While some of the violence items were originally coded dichotomously, with “yes” or “no” responses, other items were de facto dichotomous due to the high degree of right-skew in the distributions, and were re-coded as such. The violence index is therefore an approximate indicator of one’s ranking on an underlying continuum of violence potential, with high scores suggesting involvement in violence that is varied in type (some incidents more serious than others) and occurs with some regularity.

Sexual behavior is measured in terms of different modes, with each mode represented by a dichotomous or discrete variable. In waves 2–4 of the data, respondents were asked how many sexual partners they had since the last interview. In wave 1, the number of lifetime sex partners was recorded. Respondents reporting zero sex partners represent the sexually non-

¹Harris, K.M., C.T. Halpern, E. Whitsel, J. Hussey, J. Tabor, P. Entzel, and J.R. Udry. 2009. The National Longitudinal Study of Adolescent to Adult Health: Research Design [WWW document]. URL: <http://www.cpc.unc.edu/projects/addhealth/design>. The sampling weight variables provided by Add Health were not used in this study due to the use of male and female subsamples and the implementation of hierarchical linear models that account for the complex error structure in the data. Missing cases for certain variables constituted less than two percent of the analytic sample. The mean was imputed for the census-block variables, percent below the poverty line and percent never married, while zero was imputed for all other variables with missing cases and was interpreted as ‘no evidence for the behavior in question’

active mode. Virgins were included in the non-active mode. Respondents with one sex partner represent the monogamous mode, and respondents with more than one sex partner represent the competitive mode. The competitive mode is further decomposed into categories of 2–3 partners (low competitive), 4–5 partners (mid competitive), and 6 or more partners (highly competitive). The highly competitive mode makes up a small but consistent percentage of the sample in each wave (3–4 percent), however large enough to be treated as a discrete variable. Sexual behavior is therefore represented with variables that are mutually exclusive and exhaustive of the sex partner variable. Furthermore, while the number of sexual partners reported is an imperfect proxy for degrees of competitiveness, the concept is similar to dating/mating effort, or the extent to which individuals express interest and involvement in dating and sex, which is shown in prior research to be predictive of delinquent behavior (Rowe et al., 1997; Seffrin et al., 2009).

Marriage is measured with a dichotomous indicator. In waves 3 and 4 of the data, respondents indicated the month and year in which they were married. Respondents were coded as being married in waves 1–4, provided they were married for at least twelve months at the time of the interview. In each wave, respondents were recorded as employed if they indicated current and fulltime employment, defined as working 35 hours or more in a week.

Drug use is measured with a 4-item index that asks respondents how often, since the last interview, have they used marijuana, cocaine, injection drugs, and hallucinogens or other drugs. In wave 1, lifetime drug use was recorded. These four items were selected because they appear in all waves of the data. Drug items were coded as “0” or “1” to eliminate differences in measurement and then summed to create a 5-point index, range 0–4. Similar to the violence items, several of the drug items were de facto dichotomous due to the high degree of right-skew in the distribution, and were re-coded as such. Alcohol use “drunkenness” is measured with a single item which ranges from 0 “never” to 6 “almost every day” and asks respondents how often in the past 12 months they got drunk. This item appears in all waves of the data.

Childhood abuse is measured with two items that appear in wave 3 of the data. These items refer to experiences that occurred prior to the 6th grade. Respondents were asked how often a parent or caregiver hit, kicked, or slapped them (i.e., physical abuse), and how often they were forced to engage in sexual relations with a parent or caregiver (i.e., sexual abuse). Each item ranges 0 “never” to 5 “more than ten times.” Attachment to caregivers is measured with a 6-item scale, recorded in wave 1 of the data. Respondents were asked if they feel that their mother, father, caregiver are warm and loving, cares about them, and how close they are to mother, father, and/or other caregiver. Each item ranges 1 “not at all” to 5 “very much.” Cronbach’s alpha for the scale is 0.81.

Local risk factors are measured with two items that appear in wave 1 of the data. The percent of residents living below the poverty line and percent of never married adults were recorded in the census-block groups where respondents were living shortly before the time of the wave 1 interview.

Age is measured in years, and months is measured as the number of months since the wave 1 interview. The longitudinal design of the current study requires that time-varying observations are demarcated in terms of the length of time that has elapsed between waves. Thus at wave 1, months equals “0” for all respondents, but then varies between respondents in the three subsequent follow-up interviews, depending on the respondents’ respective interview dates. Further, the months variable was logged before being entered into the regression analyses (Singer and Willet, 2003).

Analytic Strategy

Descriptive statistics are presented for the male sample in Table 1. Results from longitudinal HLM regression models are presented in Tables 2 and 3. Fixed and random effects are used to statistically control for the influence of individual characteristics that are relatively stable over time but which may be correlated with variations in violence and sexual behavior (e.g., Gottfredson and Hirschi’s conception of ‘low self-control’).² Within-individual and between-individual effects for sexual behavior are presented in Tables 2 and 3, along with control variables. Within-individual components are created by subtracting each respondent’s average on X (the between-individual average) from each time-ordered observation of X. This technique allows the within-individual components to be interpreted as fixed effect regression estimates, as change in the dependent variable caused by a change in an independent variable (Raudenbush and Bryk, 2002). Once within-individual effects are statistically controlled, the between-individual effects for sexual competitiveness suggest the degree to which violent males are successful at attracting sexual partners, or likewise, the degree to which non-violence is associated with monogamous commitment. However, given that women usually choose who they have sex with, a statistically significant link between violence and male sexual behavior would suggest a bias among females for sexual partners who happen to be relatively aggressive. If both within-individual and between-individual effects for sexual behavior are statistically significant, this would suggest that male competition, as well as female choice, contribute to the link between sex and violence.

Results

Table 1 shows the distribution of modes of male sexual behavior in each wave of the data. Participation in the highly competitive mode (6 or more partners) remains fairly constant, with roughly 4 percent of males involved in this mode over the course of the study. The same goes for mid-level competitiveness (4–5 partners), whereas participation in low levels

²The multilevel/mixed regression is a two-level model, expressed below as a composite of level 1 and level 2. Composite Model:

$$Y_{ij} = \sum_{i=1}^n \gamma_k X_{ik} + (\epsilon_{ij} + \zeta_{0i} + \zeta_{1i} \text{Time}_{ij}).$$

The notation $(\epsilon_{ij} + \zeta_{0i} + \zeta_{1i} \text{Time}_{ij})$ is the stochastic part of the model and represents the random variance components (ζ) for time, the intercept, and the error (ϵ), at level 1. The notation $\sum_{i=1}^n \gamma_k X_{ik}$ is the structural part of the model and represents a vector of fixed effects and the intercept for the j th respondent at the j th time of measurement, at level 2 (see Singer and Willet, 2003).

of competitiveness (2–3 partners) rises from about 9 percent in wave 1 to 18 percent in wave 4. Monogamous involvement (1 partner) also increases over time, with about 8 percent monogamous in wave 1 and 53 percent in wave 4. Participation in the non-active mode (0 partners) decreases over time, with about 75 percent non-active in wave 1, down to 17.4 percent in wave 4.

Table 2 presents a longitudinal HLM regression analysis that includes both between-individual and within-individual effects for the different modes of sexual behavior. Model 1 compares the highly competitive mode to all other modes of sexual behavior. Findings suggest that when boys and young men transition from a highly competitive mode of sexual behavior to one that is monogamous violence declines by 0.312 points on a 5-point index. Transitioning from monogamy to a highly competitive mode increases violence by the same amount (result not shown). Violence also declines when men transition from a highly competitive mode to one that is less competitive or non-active.

Model 2 controls for marital status and employment, drug and alcohol use, childhood abuse and attachment to caregivers, poverty, and the proportion of never married adults in the respondents' census-block group. The interaction term (marriage $\times$ months) is also included in the model to account for the time-sensitive effect of marriage found in prior research (e.g., Theobald and Farrington, 2010). Marriage is shown here to reduce violence ($b = -0.201$), but according to the positive and significant interaction term 'marriage $\times$ months' ($b = 0.049$) its effect on violence diminishes the later men wait to marry. Employment status is not statistically significant. Drug use, drunkenness, and childhood abuse are all statistically significant whereas attachment to caregivers is not. Local levels of poverty are significant, whereas percent never married is not. All together these more readily accepted explanations of violence explain only about five additional percentage points in the overall variation in violence. Further, the effect of monogamy is reduced in size, but remains statistically significant, net of these controls.³

The significant between-individual effects indicate that men with little history of violence are more likely to be monogamous or non-active than competitive, whereas men with extensive histories of violent behavior are more likely to be highly competitive than monogamous or non-active. Both within-individual and between-individual effects are statistically significant, which suggests that female choice also plays a role in linking sex to violence. More specifically, the models suggest that women are more likely to have sex with men who have been violent in the past, and may be violent in the future, than with men who are less physically aggressive.

Post-Hoc Analysis

Post-hoc analyses were conducted to examine whether and to what degree the research hypotheses apply to women and how prior sexual experience may influence the link between

³The results from the HLM models were compared to results from a GEE logit model (general estimating equation), fit for repeated observations as well as to a general linear model for estimating fixed effects. The "genmod" SAS procedure produced the GEE model estimates. The SAS "general linear model" procedure was used to estimate the fixed effects regression parameters. The SAS "mixed" procedure was used to estimate the HLM regression parameters shown in Tables 2 and 3. Results from these alternative models were nearly identical to that of the HLM models.

sex and violence. Table 3 shows results for male and female respondents who were already sexually active at the time of the wave 1 interview (i.e., at least one lifetime sexual partner reported), as well as results for respondents who were sexual virgins at the time of wave 1. The former of these two groups constitutes a subset of respondents who are sexually precocious compared to their peers, which according to prior research may indicate an increased risk for delinquent behavior (e.g., Downing and Bellis, 2009). Results for virgin males and males who were sexually active at wave 1 are similar to each other and to the results shown in Table 2. However for sexually active females the within-individual effects are not statistically significant. Marriage is non-significant for precocious males, and non-significant for females in both models.

When the sample is limited to virgin females, changes in sexual behavior are found to have a significant relationship with violence, which may suggest that peer networks and routine activities have also changed to include hanging out with boys and partying (e.g., McGloin and DiPietro, 2013). The more precocious females, on the other hand, may have already made these transitions and may not compete as males do for sexual partners. Further, the significant between-individual effects for virgin females suggest that physically aggressive women have more sexual partners, on average, than less aggressive women, which is similar to what was found for men, however the same findings do not hold consistent for sexually precocious females.

Discussion of Findings

Sex is a defining feature of intimate relationships as well as a source of violent conflict, yet prior research on criminal desistance has ignored the influence of sexual behavior, focusing instead on marriage and employment to explain changes in criminal offending. Findings from the current study indicate that males, who transition to a less competitive mode of sexual behavior as evidenced by a reduction in sex partners from previous waves, reduced their risk for violent behavior. Changes in sexual behavior were shown to be more consistent and stronger in predicting violence than marriage and employment. The pro-social effect of marriage was not explained by changes in sexual behavior however, which suggests that marriage reduces male aggression for reasons other than monogamous commitment (e.g., Laub and Sampson, 2003). Findings also indicate that violent men tend to have more sexual partners than men who are less aggressive, which suggests that female choice, in addition to male competition, plays a role in linking sexual behavior to violence. The same findings were not replicated for females. This suggests that female competition does not carry the same potential for violence as male competition, if for no other reason than the fact that men are competing against other men, and women against women (Felson, 1996). As prior research suggests, in a competition for desirable partners, the malicious actions that transpire between women are more likely to take the form of psychological rather than physical aggression, such as manipulation and character assassination (Archer, 2004; Salmivalli and Kaukiainen, 2004; Vaillancourt, 2013). Furthermore, the results of the analyses were drawn from longitudinal data, which controlled for changes in drug and alcohol use as well as early childhood factors that may have accounted for the sex-violence link, but did not. Thus, the findings of this study are in support of the research hypotheses and suggest that competition for sex be further examined as a potential cause of male violence.

Limitations and Directions for Future Research

The current study is limited in several respects, foremost by the ambiguity introduced when attempting to interpret changes in sexual behavior. While changes in sexual behavior were shown to have a statistically significant influence on changes in violence, the data cannot say for sure that sexual competition is the reason why. For a male to accumulate a relatively high number of sexual partners in a short time suggests competition—fighting and wrangling with other men—although the same outcome could be achieved with little to no violence. Further, a growing body of research suggests that, rather than marriage and monogamous unions affecting violence, the relationship may also work the other way around, with crime and antisocial behavior affecting union formation and stability (Barnes et al., 2014; Bersani and Doherty, 2013; Lyngstad and Skardhamar, 2013). Unfortunately, detailed information on specific relationships was limited to a small sample of sexual partners, making it difficult to discern why some of the men became monogamous while others did not. More research is needed here on the conditions that push men and women in and out of committed relationships as it may relate to involvement in crime and violence.

A second set of limitations concerns the treatment of sexual behavior as an independent influence on violence, although prior research suggests that both behaviors may be influenced by the same social conditions. Men with a history of violence often have unstable and short-term relationships with women and come disproportionately from segments of society that have been marginalized by poverty and racial segregation (Wilson, 2011). Although marriage and monogamous relationships may offer men a healthier lifestyle, these are long-term and costly investments, whose formation and stability may therefore depend on life being predictable and free of violence (Daly and Wilson, 2005). Furthermore, high crime rates and staggering levels of unemployment can make marriage and monogamous relationships inaccessible to men who would otherwise benefit from a stable heterosexual union. A more inclusive theory of sex and violence will need to pay special attention to high-risk and marginalized groups of men and women who live under conditions of legal and economic dysfunction.

The current study was also focused primarily on male behavior; however women are not passive agents in the arena of sexual competition. Campbell (1995) for example explains that women may become violent when defending a male partner from the sexual advances of a rival female. Women can also be the victims of competitive male aggression, especially if they are believed to have been unfaithful to a partner (Archer, 2014; Capaldi et al., 2012). Further, the hypothesis that females prefer males who possess qualities which happen to correlate with aggressive behavior was tested through indirect means by examining the between-individual effects of male sexual behavior on violence. A more direct test of this hypothesis would require an assessment of women's preferences in men as well as the situations in which they may be likely to partner with an aggressive male. Finally, women's risk of criminal involvement is disproportionately affected by male associates (McGloin and DiPietro, 2013). Co-offending occurs frequently among youthful offenders, and for women in particular, criminal involvement often involves male co-offenders (Warr, 2002). The female gender and the composition of peer networks should be considered more thoroughly in future research on crime and intimate relationships.

The violence analyzed in the current study is self-reported, along with most all of the other measures, and is almost certainly non-lethal. However incidents of non-lethal violence are relatively high in the same places and within the same socio-demographic groups that have high homicide rates and official crime statistics are generally correlated with self-reports (Gottfredson and Hirschi, 1990; Zimring, 2006). Thus, the competition-violence hypothesis, by focusing on sex in addition to marriage, suggests a broader scope of behavior for criminologists to consider in future research on violence and criminal desistance.

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Table 1

Descriptive Statistics for Males, Waves 1–4

	Wave 1	Wave 2	Wave 3	Wave 4
Violence (0–4)	0.58	0.42	0.28	0.13
	<i>0.90</i>	<i>0.82</i>	<i>0.62</i>	<i>0.47</i>
%Sexual Behavior (#partners since last wave)				
Highly Competitive (6 or more)	3.85	4.07	4.66	4.59
Mid Competitive (4–5)	3.89	3.96	6.05	5.96
Low Competitive (2–3)	9.72	8.42	21.84	19.73
Monogamous (1)	7.72	7.16	42.46	53.36
Non-Active (0)	74.81	76.4	24.99	17.36
Marriage and Employment				
%Married	0.41	0.41	12.99	42.77
%Employed	3.57	8.22	52.95	63.02
Drug and Alcohol Use				
Drugs (0–4)	0.36	0.35	0.85	1.09
	<i>0.66</i>	<i>0.65</i>	<i>1.00</i>	<i>1.11</i>
Drunkenness (0–6)	0.63	0.79	1.40	1.26
	<i>1.28</i>	<i>1.44</i>	<i>1.59</i>	<i>1.45</i>
Caregiver Abuse and Attachment				
Physical Abuse (0–5)			0.81	
			<i>1.48</i>	
Sexual Abuse (0–5)			0.70	
			<i>0.43</i>	
Attachment (1–5)			4.56	
			<i>0.50</i>	
Local Risk Factors				
%Below Poverty Line	13.44			
	<i>13.15</i>			
%Never Married	24.80			
	<i>8.50</i>			
Age	15.84	16.31	21.77	28.27
	<i>1.63</i>	<i>1.65</i>	<i>1.66</i>	<i>1.67</i>
Months	0	10.99	76.26	154.39
	-	<i>1.78</i>	<i>2.87</i>	<i>3.49</i>
N = 4,597				

Note: Standard deviations appear in italics, beneath the means. Ranges appear in parentheses.

Table 2

Longitudinal HLM Regression Analysis of Sex and Violence

Fixed Effects	b	S.E.	b	S.E.
<u>Sexual Behavior (Within-Individual)</u>				
Highly Competitive			Comparison group	
Mid Competitive	−0.159 ***	0.033	−0.140 ***	0.033
Low Competitive	−0.232 ***	0.028	−0.203 ***	0.028
Monogamous	−0.312 ***	0.027	−0.249 ***	0.028
Non-Active	−0.363 ***	0.027	−0.294 ***	0.027
<u>Sexual Behavior (Between-Individual)</u>				
Highly Competitive			Comparison group	
Mid Competitive	−0.389 ***	0.074	−0.382 ***	0.072
Low Competitive	−0.611 ***	0.059	−0.555 ***	0.058
Monogamous	−0.857 ***	0.055	−0.722 ***	0.055
Non-Active	−0.987 ***	0.052	−0.782 ***	0.053
<u>Marriage and Employment (Within-Individual)</u>				
Married			−0.201 **	0.071
Married × Months			0.049 **	0.016
Employed			−0.014	0.013
<u>Drug and Alcohol Use (Within-Individual)</u>				
Drug Use			0.052 ***	0.008
Drunkenness			0.058 ***	0.004
<u>Caregiver Abuse and Attachment</u>				
Physical Abuse			0.018 ***	0.004
Sexual Abuse			0.049 ***	0.013
Attachment			0.001	0.012
<u>Local Risk Factors</u>				
%Below Poverty Line			0.151 **	0.050
%Never Married			0.112	0.078
<u>Age and Time</u>				
Age	−0.017 ***	0.002	−0.021 ***	0.002
Months	−0.054 ***	0.004	−0.054 ***	0.005
<u>Random Variance Components</u>				
Within-Individual	0.014 ***	0.001	0.014 ***	0.001
Between-Individual	0.479 ***	0.016	0.434 ***	0.015
<u>R-square</u>				
	0.125		0.171	
<u>BIC</u>				
	36279.4		35458.9	

<u>Fixed Effects</u>	<u>b</u>	<u>S.E.</u>	<u>b</u>	<u>S.E.</u>
N = 4,597				

Intercepts were estimated but are not shown. Race/ethnicity and the between-individual components for marriage, employment, drug and alcohol use are included in model 2, but not shown in the table.

p.*<.05,

**
<.01,

<.001.

HLM Analysis of Sex and Violence: Controlling for Gender and Sexual Status at Wave 1

Table 3

	Males			Females		
	Virgin Wave 1	Sexually Active Wave 1	Virgin Wave 1	Sexually Active Wave 1	Virgin Wave 1	Sexually Active Wave 1
	N = 3,439	N = 1,158	N = 4,506	N = 1,017		
	b	S.E.	b	S.E.	b	S.E.
<u>Sexual Behavior (Within-Individual)</u>						
Comparison group						
Highly Competitive						
Mid Competitive	-0.107 *	0.044	-0.156 **	0.055	-0.071	0.040
Low Competitive	-0.197 ***	0.037	-0.180 ***	0.047	-0.070 *	0.034
Monogamous	-0.237 ***	0.036	-0.215 ***	0.048	-0.066 *	0.033
Non-Active	-0.244 ***	0.036	-0.226 ***	0.050	-0.045	0.033
<u>Sexual Behavior (Between-Individual)</u>						
Comparison group						
Highly Competitive						
Mid Competitive	-0.424 ***	0.103	-0.333 **	0.115	-0.261 **	0.083
Low Competitive	-0.536 ***	0.083	-0.552 ***	0.093	-0.192 **	0.070
Monogamous	-0.734 ***	0.079	-0.689 ***	0.090	-0.264 ***	0.068
Non-Active	-0.744 ***	0.079	-0.728 ***	0.104	-0.257 ***	0.068
<u>Marriage (Within-Individual)</u>						
Married	-0.188 *	0.075	-0.075	0.166	-0.018	0.043
Married × Months	0.046 **	0.017	0.023	0.038	0.007	0.010
R-square	0.110	0.214	0.081	0.115		
N = 10,120 (total sample)						

Intercepts were estimated but are not shown. Models control for all variables present in Table 2. p.

* <.05,
 ** <.01,
 *** <.001.