CHAPTER **23**

Violence and Homicide Following Partner Infidelity

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Abstract

Infidelity is one of the greatest adaptive challenges of our reproductive lives. A partner's infidelity can lead to their defection from the relationship and offspring, loss of important resources, and for men, cuckoldry. It is unsurprising, then, that humans have evolved adaptations meant to prevent, curtail, and punish a partner's infidelity. Among the most devastating of these are the perpetration of intimate partner violence, homicide, uxoricide, and filicide. This chapter reviews theory and supporting evidence that aggression has evolved, in part, as an adaptive set of behavior meant to prevent and respond to infidelity. It begins by describing the particular reproductive challenges posed by infidelity for men and women. Next, it reviews the available evidence that violence and killing is an abhorrent, yet predictable response to real or suspected infidelity, with attention paid to sex differences in these acts. The putative adaptive functions of different types of aggression toward an intimate partner, a sexual rival, and toward offspring are discussed. It then highlights the important role of perceptual biases surrounding infidelity and negative affect, including jealousy and anxiety, in mediating aggressive responses to infidelity. Finally, adaptive explanations of individual differences, cultural contexts, and environmental factors in predicting violent responses to infidelity are discussed and future directions are offered in order to highlight the pressing need for continued research on the adaptive functions of violence occurring in the shadow of infidelity.

Key Words: infidelity, intimate partner, violence, IPV, homicide, sexual proprietariness, jealousy, filicide, infanticide

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Infidelity: An Important Adaptive Challenge

Humans are among the roughly 5% of mammals that exhibit social monogamy and biparental care (Kleiman, 1977). Human females are also somewhat unique among mammals in that they remain sexually receptive throughout their reproductive cycles (i.e., extended sexuality; Grebe et al., 2013) and they do not conspicuously signal their fertility status (Haselton & Gildersleeve, 2011). Although biparental care provides many benefits to offspring survival and development (see Arnocky & Carré, 2016, for review; Buss & Shackelford, 1997a; Shackelford, Goetz, et al., 2005), these extended mating relationships also confer greater risk and relevance of infidelity to an individual's reproductive success.

Sexual infidelity is both common (i.e., in up to 25% of marriages; Wiederman, 1997), and universal, spanning diverse cultural, historical, and contextual boundaries (Fincham & May, 2017). As such, infidelity represents a fundamental reproductive challenge; one for which humans appear to have evolved a suite of perceptual, emotional, and behavioral abilities, tactics, and strategies to overcome (Buss, 2013; Buss & Duntley, 2014; Goetz et al., 2005; Platek & Shackelford, 2006; Starratt et al., 2007). There are many potentially violent consequences to real or suspected infidelity, ranging from psychological, physical, or sexual violence perpetrated against the partner, physical violence perpetrated against a same-sex rival, and sometimes, the abuse and killing of children. What these apparently diverse acts and targets of aggression all have in common is, broadly, their robust links to (typically) male sexual proprietariness, which embodies men's attempts to control and monopolize the reproductive decisions of women to stymie infidelity, reduce paternity uncertainty, and prevent women's attempts to defect from the romantic relationship (Daly & Wilson, 1988; Taylor, 2012; Wilson & Daly, 1996).

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Several scholars in evolutionary psychology have argued that the physiological, cognitive, and affective factors underpinning behavioral responses to infidelity, such as intimate partner violence (IPV), constitute adaptations (e.g., Barbaro, 2017; Buss & Duntley, 2011, 2014; Goetz Shackelford, Romero, et al., 2008). Adaptations may be defined as reliably occurring heritable traits that were selected because they enhanced the ability of an organism to survive and reproduce in its evolutionary past (Buss et al., 1998; Confer et al., 2010; Tooby & Cosmides, 1990). Candidates for psychological adaptations among humans include traits that: (1) contribute to reproductive success; (2) have simpler precursors in nonhuman animals, particularly close phylogenetic relatives; (3) have a direct function (i.e., they serve to overcome adaptive problems); (4) are deployed in a contextspecific, cost-efficient, and goal-directed manner; (5) are flexibly responsive to evolutionarily relevant social and environmental inputs; and (6) are represented across cultures with a meaningful level of consistency. Importantly, the operation of adaptations does not require conscious awareness of their existence nor need they be good, innocuous, or ethical at an individual or societal level (Confer et al., 2010; Crippen, 2018). Many kinds of repugnant and societally damaging behavior (e.g., IPV) may constitute adaptions that require ultimate (i.e., distal) explanations that relate to their functional significance (Archer & Vaughan, 2001; Daly, 2014; Vandermassen, 2011; Welling & Nicolas, 2015). This in no way implies that the behavior under consideration is morally acceptable or immutable (i.e., the product of genetic determinism), but rather that it is not solely the product of socialization, culture, and societal structures. Nonetheless, when studying human psychology it is necessary and fruitful to consider how culture and other proximate (i.e., immediate) mechanisms contribute to produce the behavior in question, which highlights the potential complementarity of sociocultural and evolutionary theorizing (Brown et al., 2018; Daly, 2014; Goetz Shackelford, & Camilleri, 2008; Ward & Siegert, 2002).

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Heritable traits that enhance fitness may co-opt existing adaptations to perform functions other than the purpose for which they had been selected (i.e., an exaptation; Havliček et al., 2015). One example is the large trunk of elephants, which may have originally evolved to accommodate enlarged tusks (i.e., hypertrophy), but have since been exapted for several different functions (e.g., sound production, digging, and a snorkel for swimming; Brosius, 2019). Furthermore, an exapted trait can be useful for an organism's survival or reproduction in its current environment, but constitutes a byproduct of an adaptation with no proper direct function (i.e., a spandrel). Therefore, it is prudent to consider whether the perceptual, cognitive, and affective mechanisms coordinating aggression and violence in response to infidelity constitute adaptations, exaptations, or spandrels (Buss & Duntley, 2011; Goetz Shackelford, & Camilleri, 2008; Thornhill & Palmer, 2000; West, 2007; Wilson & Daly, 1996).

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In this chapter, our goal is to highlight the adaptive problems posed by social monogamy, biparental care, and extended sexuality, specifically emotional infidelity (i.e., forming a deep emotional bond with someone outside the mateship) and sexual infidelity (i.e., extrapair copulations; Kruger et al., 2015). The psychological mechanisms embodying information-processing procedures that reliably manifest in response to infidelity are described and their adaptive utility is considered. Special attention is given to the sexspecific nature of aggression and violence in response to actual or suspected infidelity, as well as counterstrategies to avoid these costly actions, which arguably correspond to the unique adaptive challenges likely faced by ancestral women and men over their evolutionary histories (Buss & Duntley, 2011, 2014).

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Partner/Child Abandonment

Extramarital affairs play an important role in the destabilization of mating dyads. Yet, Hall and Fincham (2006) caution that identifying how influential infidelity is to relationship dissolution is difficult because (1) mitigating factors associated with infidelity, such as incompatibility or drug use, can also influence divorce directly, and (2) those who separate following infidelity tend to include other factors within their reasoning for the breakup. Nevertheless, there is a clear positive link between infidelity and breakup of the dyad, as described more thoroughly in chapter 18 of this book. Kelly and Conley (1987) reported longitudinal data from a study in which 300 married couples were followed from the 1930s until 1980. Results showed that of those who got divorced, 32% directly cited infidelity, while additional couples cited related reasons like "wife's devotion to another man." In the British National Survey of Sexual Attitudes and Lifestyles (NATSAL; Erens et al., 2001), which included data from over 12,000 participants, 37% of those who had experienced the failure of their first live-in partnership reported infidelity as a contributing factor to the dissolution of that relationship. In modeling differential demographic and proximate factors contributing to divorce, Amato and Rogers (1997) found that infidelity was the strongest predictor of relationship dissolution.

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Relationship dissolution can have drastic implications for the family and parenting structure. News articles on the topic often present vivid case examples such as:

C23.P7 Alison says her oldest son, who is now five, still asks about his house and his friends and his toys, and why Daddy is choosing his new girlfriend and their son over him. She says he'd ask, "Why is Daddy living with that baby and not me? I am his first baby. I am his number one boy. How come he doesn't want to always be with me?" (Barmak, 2018).

The British Economic and Social Research Council reported that only 49% of fathers who do not live with their children say they still have regular contact with them, and that 13% never see their children (Poole et al., 2013).

C23.S3 Loss of Resources/Coparenting

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To the extent that infidelity is a major catalyst of relationship dissolution, it is important to understand the effects of familial breakup, more generally, upon offspring. One potential outcome is the loss of paternal resource provisioning to children. In the United Kingdom, it is estimated that only 29% of those fathers who never see their children provide financial support (Poole et al., 2013). In some instances, this may be linked to the reinvestment of those resources into the offspring of another woman. Again, in the United Kingdom, three in 10 fathers who have nonresident dependent age children are also living with other dependent children (Poole et al., 2013). Loss of male resources and parental investment would have been a particularly relevant challenge for ancestral women, given their reliance upon male resource provisioning for offspring survival. It is well understood that biparental care facilitates offspring survival and reproductive fitness (see Arnocky & Vaillancourt, 2017). Data from hunter-gatherer and preindustrial Western populations converge to demonstrate that father-present children are more likely to survive than father-absent children (Hill & Hurtado, 1996; Geary, 2000). In contemporary Western society, evidence also shows that father-present children score higher on social and academic skills alongside higher income in adulthood relative to father-absent children (Geary, 2000).

Cuckoldry

The unsuspecting investment in genetically unrelated offspring, which comes at the expense of investment in one's own genetic offspring, is a reproductive challenge that is faced specifically by men. Contemporary rates of nonpaternity appear to be low in the general population, ranging between 1% and 2%, which some researchers have ascribed to the ability of modern birth control practices to regulate conception. Recent estimates for several historical populations also suggest a similarly low nonpaternity rate. However, nonpaternity rates do increase in specific populations where infidelity is ostensibly suspected more regularly, such as among those seeking paternity testing because of contested fatherhood, where rates appear to be between 10% and 30% (see Larmuseau et al., 2016,

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for review). Other research highlights the threat of extrapair paternity in traditional societies. For example, Scelza et al. (2020) found that among Himba pastoralists, the rate of extrapair paternity was nearly 50%, with more than two-thirds of mating relationships having at least one child resulting from extrapair copulations. Moreover, both sexes demonstrated accuracy at detecting such offspring. Therefore, cuckoldry has likely been a recurrent adaptive problem that men have evolved psychological mechanisms to reduce the risk of (Buss & Duntley, 2011).

C23.S5 Evidence of Violence in Response to Real or Suspected Infidelity

C23.S6 C23.P11

Intimate Partner Violence

One of the most common correlates of real or perceived infidelity is IPV, which is defined as "behavior within an intimate relationship that causes physical, sexual, or psychological harm, including acts of physical aggression, sexual coercion, psychological abuse, and controlling behavior. This definition covers violence by both current and former spouses and partners" (World Health Organization [WHO], 2017a). Examples of physical violence include throwing items at a partner, threatening, slapping, kicking, choking, burning, using a weapon against, or hitting the partner (WHO, LSHTM, & SAMRC, 2013). Examples of emotional or psychological abuse involve "insults, belittling, constant humiliation, intimidation (e.g. destroying things), threats of harm, [or] threats to take away children" (WHO & The Pan American Health Organization, 2012, p. 1). This form of violence occurs in all countries and, as such, is a widespread problem (WHO, 2002; WHO & LSHTM, 2010). Of women who have been in a relationship, an estimated 30% have experienced physical or sexual violence, or both, by an intimate partner (Devries et al., 2013; WHO, LSHTM, & SAMRC, 2013), with IPV being more likely to occur in lower income countries (WHO & LSHTM, 2010). For instance, lifetime rates of physical and sexual IPV in Tanzania have been found to be as high as 61% (Kapiga et al., 2017). In a cross-sectional study conducted by the WHO based on data from 12 countries, between 20% and 75% of women, and 45% of men, have experienced emotional abuse from an intimate partner (García-Moreno et al., 2005). The majority of the victims are girls and women, with men being the primary perpetrators (WHO & LSHTM, 2010). Importantly, IPV can also be perpetrated via digital means (i.e., cyber IPV), such as digital dating abuse, where electronic technologies (e.g., cellphones, computers, and gaming consoles) are used to control, harass, and/or aggress against mates (Bhogal et al., 2019). Among American college-aged students, some estimates of digital dating abuse victimization are as high as 74%, indicating that cyber IPV may be a particularly powerful form of partner-directed aggression (Reed et al., 2016). There appear to be no significant sex differences in the frequency of experiencing digital dating abuse; however, men may be more likely to perpetrate sexual cyber IPV and women more likely to interpret sexual digital dating abuse (e.g., "sexting") more negatively (see Reed et al., 2016).

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Shields and Hanneke (1983) identified that women who committed infidelity during their prior relationship were more likely to experience sexual and physical abuse at the hands of their partner. Other researchers have also noted that suspicions and perceptions of extradyadic relations-having emotional or sexual relations with others outside of an exclusive mateship—are related to the perpetration of IPV (Neal & Lemay, 2019; Nemeth et al., 2012). For example, in their study of heterosexual couples, Nemeth et al. (2012) found that IPV was consistently triggered by infidelity. Specifically, these researchers examined the content of telephone calls between 17 heterosexual couples, in which the man was incarcerated for domestic violence. The female victims had suffered serious injuries during the attacks, such as strangulation, head trauma, bite wounds, and even lost pregnancies. Results of this qualitative examination demonstrated that across couples, violence was precipitated by suspicion or knowledge of infidelity (see Davis et al., 2019). In sub-Saharan Africa it has also been found that real or perceived extramarital relationships are common causes for IPV (Conroy, 2014; Karamagi et al., 2006). In North America, men who suspected a partner was likely to cheat reported more controlling behavior, which in turn predicted violence against intimate partners (Cousins & Gangestad, 2007). In addition, Arnocky, Sunderani, et al. (2015) supported positive correlations between anticipated partner infidelity and IPV (physical assault, partner injury, sexual coercion, and psychological aggression) in a sample of college-aged men.

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From an evolutionary perspective, several scholars have posited that IPV may have evolved to prevent the diversion of key mating resources that impact reproductive success (Buss & Duntley, 2011, 2014; Shackelford, 2003; Shackelford, Goetz, et al., 2005). Generally speaking, IPV may be considered a form of cost-inflicting mate retention behavior, including emotional manipulation, controlling behavior, and physical abuse, that functions to stymie women's and men's infidelity and to reduce the likelihood of defection from the mateship (Albert & Arnocky, 2016; Davis et al., 2018; Miner, Shackelford, et al., 2009; Miner, Starratt, et al., 2009). For ancestral women, a mate's infidelity, especially emotional infidelity, could have signaled the loss of physical protection for her and her offspring, as well as the loss of provisioning and paternal investment (Buss & Duntley, 2014). In contrast, for men, infidelity, particularly sexual infidelity, could have signaled the loss of paternity, unwittingly investing parental and material resources in genetically unrelated offspring, reputation damage, and forgone opportunities to mate with other women. The sex-differentiated aspects of these adaptive challenges has led evolutionary researchers to posit that IPV may adaptively function as an anticuckoldry tactic for men to reduce the likelihood that a female partner may consort with mate poachers (i.e., individuals attempting to pry committed mates away from their relationships; Arnocky et al., 2013) or defect from the mateship as a consequence of fearing violent abuse toward her and her offspring (Barbaro, 2017; Barbaro & Shackelford, 2016; Buss & Duntley, 2011, 2014; Goetz Shackelford, Romero, et al., 2008; Kaighobadi, Shackelford, & Goetz, 2009; Platek & Shackelford, 2006).

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Several lines of evidence support the potential adaptive utility of IPV in response to suspected or actual infidelity. Male sexual coercion-the use of intimidation and force toward females to heighten the probability of mating with the male aggressor and to lower the likelihood of mating with rivals—has been observed among various species of primate (Smuts, 1992; Stumpf & Boesch, 2010). Across varied cultural contexts, men's sexual jealousy (i.e., negative affect in response to a real or perceived threat of a mate's sexual infidelity; Davis et al., 2016) has been shown to be to be a potent harbinger for spousal battery (Buss, 2000; Counts, 1992; Daly & Wilson, 1988; Smuts, 1992). Specifically, domestic assault appears to function primarily to prevent infidelity, whereas in-pair sexual assault seems to be a response after infidelity has been committed (Camilleri & Quinsey, 2009; Daly & Wilson, 1992; Goetz & Shackelford, 2006). Men's sexual coercion, ranging from emotional manipulation (e.g., withholding benefits to gain sexual access to one's partner) to physical force (i.e., rape), has been linked to suspected and past female infidelity using both self- and partner-reports (Goetz & Shackelford, 2009). Moreover, perceived sexual ownership and feelings of jealousy (i.e., male sexual proprietariness) have been argued to be key factors underpinning men's heightened levels of threat and their IPV toward their pregnant partners (Taylor, 2012). Within abusive relationships, pregnant women appear to face a higher risk of physical and emotional abuse, sexual violence, stalking, threats of death and violence, as well as coercive power and control tactics by their intimate partners (Burch & Gallup; 2004; Buss & Duntley, 2011). Evidence also suggests that women carrying the child of another man are more likely to be abused by their current partner (Martin et al., 2004; Taillieu & Brownridge, 2010). Taken together, this body of evidence highlights that infidelity and IPV frequently intersect; real or suspected female infidelity likely precipitates and maintains, but does not justify, violence against women. However, it is important to acknowledge that such cross-sectional studies, while informative, are limited in their ability to examine causal mechanisms of IPV. Specifically, it is difficult to determine the extent to which infidelity directly leads to abuse, relative to the possibility of individuals who are abused perhaps being subsequently more likely to be unfaithful (Arnocky, Sunderani, et al., 2015). Further complicating the matter, some researchers have classified infidelity as a subset of IPV and a means of harming one's partner (Utley, 2017). Moreover, men who are suspected by their partner of infidelity are also more likely to perpetrate acts of IPV (WHO & LSHTM, 2010).

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Nonetheless, there are reasons to question whether the physiological and psychological mechanisms underpinning IPV in response to infidelity constitute adaptations. Costinflicting mate retention is a risky reproductive strategy to perform because it may result in violent retaliation, even death, by one's intimate partner and increase the likelihood of termination of the relationship (discussed in Davis et al., 2018, Duntley & Shackelford, 2012, and Miner, Starratt, et al., 2009). For instance, Shackelford and Buss (2000) found that the frequency of particular cost-inflicting acts (e.g., monopolization of a mate's time, threatening to commit infidelity, and emotional manipulation) corresponded to

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significantly lower levels of general marital satisfaction among young American adult newlyweds. Similar results have been found for Croatian heterosexual adults in long-term romantic relationships (Salkicevic et al., 2014). Lower relationship satisfaction has been found to be an important predictor of relationship dissolution, particularly in women (Røsand et al., 2014), which brings into question the effectiveness of IPV as a means of retaining one's partner. Concern over and actual instances of IPV are also common reasons for women to terminate their pregnancies in modern society (Biggs et al., 2013; Chibber et al., 2014; Taylor, 2012; WHO, LSHTM, & SAMRC, 2013). Evidence of selfinduced abortions through various different methods (e.g., ingesting toxic plants/herbs) appear across different cultural circumstances and extend back to ancient civilizations (Sensoy et al., 2015). Pregnant women who are abused by their partners also frequently experience blows to the abdomen, which can increase the risk of miscarriage (Jasinski, 2004; Morland et al., 2008; Valladares et al., 2005). Although IPV toward pregnant partners may be a response to concerns of nonpaternity to eliminate rival offspring (Buss & Duntley, 2011), it is challenging to empirically weigh the reproductive costs and benefits of killing pregnant partners or strategically injuring them to encourage miscarriage over suspicions of infidelity and lost paternity.

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Female-Perpetrated IPV, Jealousy, and Infidelity

There is good evolutionary rationale to suspect that men will be the primary perpetrators of overt, risky, and damaging forms of IPV, as a consequence of male sexual proprietariness, male sexual coercion, paternity uncertainty, as well as their greater androgen levels (testosterone) and general propensity for more aggressive behavior (Carré et al., 2011; Daly & Wilson, 1988; Smuts, 1992). However, evidence suggests that, particularly in cultures that are higher in gender parity (e.g., the United States, Canada, and the United Kingdom), women and men perpetrate common forms of emotional and physical violence to a similar extent (Archer, 2006, 2018; Graham-Kevan & Archer, 2003; Straus, 2009). The majority of emotional and physical IPV appears to be bilateral, whereby both partners are engaged in mutual violence toward one another (Babcock et al., 2019; Madsen et al., 2012). Although self-defense and retaliation are commonly cited motives for women's IPV, as well as men's (Babcock et al., 2019), anger and getting a partner's attention are prevalent motivating factors for women's physical violence against their male partners (see Bair-Merritt et al., 2010, for review). Nonetheless, to date few researchers have examined, in a detailed manner, the specific reasons why women engage in unilateral (i.e., female-only) and bilateral aggression against their partners. Since jealousy has been proposed to serve a similar function in women and men (i.e., to initiate mate retention behavior to drive off rivals, prevent infidelity, and hinder defection from the mateship), suspected or actual partner infidelity may motivate women's IPV. For instance, romantically jealous women have been found to engage in more relational aggression (i.e., behavior aimed at damaging relationships and social standing) toward their mates (Arnocky et

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al., 2012). Relational aggression, in turn, has been linked to lower reported marital quality in longitudinal research (Coyne et al., 2017). Both partnered women and men higher in cognitive jealousy (i.e., worry and suspicions about partner infidelity) and behavioral jealousy (i.e., surveillance behavior to stymie infidelity) are more likely to be perpetrators of IPV (Rodriguez et al., 2015). Similarly, anxious jealousy (i.e., rumination about suspected partner infidelity) and preventive jealousy (i.e., action taken to prevent a partner from consorting with others where infidelity may occur) positively predicts women's and men's cost-inflicting mate retention (Davis et al., 2018). Therefore, it is evident that the perpetration of IPV is not a male-specific phenomenon, and that jealousy is an important factor underpinning women's violence directed toward their partners.

Sexual Coercion and Rape

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Rape of an intimate partner is a particularly salient and abhorrent form of sexual IPV that many scholars from varying perspectives have studied. Rape is defined as a form of nonconsensual sexual behavior (e.g., forced vaginal/anal intercourse, digital penetration, oral sex, or penetration with an object) associated with sexual aggression, violence, and violations to bodily autonomy (Clutton-Brock & Parker, 1995; Thornhill & Palmer, 2000; Vandermassen, 2011; Ward & Siegert, 2002). Cross-culturally, some academics have found estimates of rape among married women to range from 10 to 14% (reviewed in Martin et al., 2007). Other researchers have found slightly higher estimates, ranging from 10% to 26% (reviewed in Kaighobadi, Shackelford, & Goetz, 2009). In the United States, women's lifetime prevalence of rape by an intimate partner has been found to be about 9% (Breiding, 2014). In the context of intimate romantic relationships, several evolutionary scholars have posited that rape may function as a sex-specific anticuckoldry tactic that is triggered by men's sexual jealousy in response to a partner's suspected or actual sexual infidelity (i.e., the cuckoldry risk hypothesis; Goetz & Shackelford, 2009; Goetz, Shackelford, et al., 2008; Lalumière et al., 2005; Platek & Shackelford, 2006; Thornhill & Thornhill, 1992; Wilson & Daly, 1992). Ancestral men, but not women, had to deal with uncertainty regarding the genetic relationship that they shared with their offspring (i.e., paternity uncertainty). Therefore, rape in response to a mate's sexual infidelity could have promoted competition with a rival's sperm in a female partner's reproductive tract to prevent cuckoldry (Goetz & Shackelford, 2009). Evidence indicates that sperm can live up to five days inside of a women's reproductive tract (Holt & Fazeli, 2016), suggesting that a relatively large window of opportunity exists for men to deploy sperm competition tactics. Although researchers have consistently argued and empirically demonstrated that men's sexual jealousy and suspicions of infidelity are key predictors of in-pair rape, cross-cultural estimates regarding the motivating factors of forced in-pair copulation are uncertain and in need of investigation (Wegner et al., 2015).

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For decades scholars have debated whether rape as an anti-cuckoldry tactic is adaptive or not. It is important to stress that this question is qualitatively different from

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considerations of whether nonpartner rape is adaptive for less desirable men to secure reproductive opportunities with female partners (i.e., the mate deprivation hypothesis), or whether rape is an exaptation of men's relatively higher sex drives and preference for sexual variety (Camilleri & Quinsey, 2009; Goetz Shackelford, & Camilleri,, 2008; Quinsey & Lalumière, 1995; Shields & Shields, 1983; Symons, 1979; Thornhill & Palmer, 2000; Vandermassen, 2011). Many converging lines of evidence support the potential adaptive utility of rape. Forced in-pair copulation occurs in several nonhuman animals following female extrapair mating (Barash, 1977; Cheng et al., 1983; McKinney et al., 1984). Humans are also a pair-bonding and socially monogamous species, meaning that ancestral men would have had to deal with the threat of sexual infidelity and paternity uncertainty throughout their evolutionary histories (Buss & Duntley, 2011; Goetz Shackelford, Romero, et al., 2008). Despite significant variability, in-pair rape is a historically and cross-culturally universal phenomenon (reviewed in Grubin, 1992; Shackelford, Goetz, et al., 2005; Wilson & Daly, 1992, 1993). Furthermore, partner rape has a proposed direct function of encouraging sperm competition to avoid cuckoldry (Goetz & Shackelford, 2009; Shackelford & Goetz, 2007). It is also possible that ancestral men who engaged in sperm competition tactics such as rape would have had greater reproductive success relative to men who did not engage in these tactics. Perhaps surprisingly, the probability of conception as a consequence of partner rape for women is similar, sometimes higher, to that of women having consensual sex with their partners (Basile et al., 2018; Gottschall & Gottschall, 2003; McFarlane, 2007). Moreover, many researchers have supported a positive link between in-pair sexually coercive behavior (including rape) with men's suspicions of their partner's infidelity, as well as women's reports of past infidelities and future infidelity intentions (Camilleri & Quinsey, 2009; Camilleri & Miele, 2017; Goetz & Shackelford, 2009; He & Tsang, 2017; Shackelford & Goetz, 2007; Wilson & Daly, 1996). Women also appear to have evolved a suite of counteradaptations that reduce the likelihood of rape, including the formation of alliances for protection and to seek revenge against rapists, selecting physically formidable male partners who can intimidate or effectively retaliate against rapists (i.e., the bodyguard hypothesis) and the systematic avoidance of individuals and contexts wherein rape may be more likely to occur mediated through the heightened expression of anxiety and fear (see Duntley & Shackelford, 2012 for discussion).

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Nonetheless, there are reasons to question the adaptive utility of partner rape as an anticuckoldry tactic for the purpose of sperm competition. In-pair rape can be an extremely risky strategy, particularly in more developed cultural contexts, resulting in severe social sanctions and legal consequences, as well as aggressive retaliation or death on behalf of kin, allies, and community members (Adams-Clark & Chrisler, 2018; Grubin, 1992; Starratt et al., 2007; Ward & Siegert, 2002). Although limited, evidence suggests that some men fail to ejaculate when they rape women (Grubin, 1992). In a similar vein, many women do not orgasm or fake orgasm when raped by their partners (Thomas et al., 2016;

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Ward & Siegert, 2002), which may reduce the likelihood of conception (Wheatley & Puts, 2015). It is also possible that men's forced in-pair copulation could be an exaptation of their cost-inflicting mate retention that functions primarily to dominate, control, and intimidate their partners (i.e., sexual proprietariness; Daly & Wilson, 1988), rather than for the explicit purpose of sperm competition. It is also evident that same-sex partner rape occurs among women and men in the contexts of homosexual and bisexual relationships, and that women, at times, rape their male and female partners (Sable et al., 2006; Walker et al., 2005). Moreover, there is little evidence that in-pair rape produces concrete benefits in terms of men's reproductive success in the form of siring more genetically related offspring in comparison to men who do not use this strategy. See chapter 24 for a more detailed discussion of infidelity and sexual coercion.

Intimate Partner Homicide

Sometimes, violence against a partner extends beyond physical and emotional scars, resulting in either uxoricide (killing of a female intimate partner) or mariticide (killing of a male intimate partner; United Nations Office on Drugs and Crime [UNODC], 2019a). Globally, an estimated 24% to 48% of homicides are perpetrated by an intimate partner, and of those cases, the majority (82%) of victims are women (UNODC, 2019a, 2019b). For women, this translates to an intimate partner homicide (IPH) rate of 0.8 per 100,000 women (UNODC, 2019a). It should be noted that while other studies find somewhat lower rates for males being the victim of IPH (such as the 6% found in the meta-analysis by Stöckl et al., 2013), the general trend remains consistent: Women make up the vast majority of victims of IPH. Further, an unfortunate epiphenomenal feature of IPH exists: When the total female homicide rate decreases in a country, the proportion of IPHs increases. This is evidenced by IPH remaining consistent over time, despite a decrease in homicide generally (UNODC, 2019a). It is important to note that IPH also occurs among homosexual, bisexual, lesbian, and other couples. Relative to heterosexual couples, gay and lesbian couples face additional social and cultural stressors (e.g., public stigma, familial isolation, and the absence of social services) that may increase the risk of domestic violence and IPH (Meyer, 2003). Examining over 50,000 IPHs in the United States, Mize and Shackelford (2008) found that IPH occurred more often among gay couples relative to heterosexual couples, and that those in lesbian relationships had the lowest rates of IPH. Relative to heterosexual couples, individuals in gay and lesbian relationships more often committed IPH via stabbing, beating, and strangulation. Nonetheless, empirical work on rates of IPH across differing sexual orientations is limited and in need of further investigation.

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C23.S9

C23.P20

In previous work, the killing of an intimate partner has been frequently linked to infidelity. Chimbos (1978) interviewed 34 Canadians who had killed their spouses (29 men and 5 women). Eighty-five percent of those individuals indicated that sexual matters (e.g., female denials to sexual intimacy or female infidelity) constituted the central source of

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disputes within their marriages, with wives' infidelity resulting in more disputes than husbands' infidelity. When related to infidelity, IPH is considered to be an extreme form of male sexual proprietariness (Daly & Wilson, 1988). This form of homicide can also be classified as an expressive homicide, in which the crime is typically unplanned and results from an overemotional state (Buss, 2000; Taylor, 2016). As a result, when men kill their partners, the perpetrator sometimes receives sympathy from others as it is perceived differently from other crimes (i.e., the crime was committed as a result of passion; Evzonas, 2018).

C23.P22

Several researchers have examined men's homicide of their opposite-sex intimate partners (i.e., uxoricide) from an evolutionary perspective (Buss, 2000; Daly et al., 1982; Kaighobadi, Shackelford, & Goetz, 2009; Mize et al., 2011; Peters et al., 2002; Wilson & Daly, 1993, 1996). Some scholars have posited that uxoricide may best be explained as a byproduct of men's evolved sexual strategies to seek out exclusive sexual access to their female mates in order to reduce paternity uncertainty and avoid cuckoldry (Daly & Wilson, 1988; Wilson & Daly, 1993, 1996). This has been the labeled the "slip-up" theory of IPH (Shackelford et al., 2000). Uxoricide may also be a byproduct of younger men's heightened homicidal attitudes and behavior relative to older same-sex conspecifics (i.e., routine activities theory; discussed in Mize et al., 2011, and Shackelford et al., 2000). Alternatively, other researchers have advanced the hypothesis that uxoricide may be produced by an adaptation selected to increase reproductive success (i.e., evolved homicide module theory; Duntley & Buss, 2005).

Evidence supporting uxoricide as adaptive includes: (1) male primates killing female mates in response to sexual infidelity (Smuts, 1992; Smuts & Smuts, 1993); (2) men's experience of sexual jealousy and suspicions of infidelity as reliable antecedents of uxoricide (Archer, 2013; Daly & Wilson, 1988); (3) a heightened risk of uxoricide for younger, more reproductively valuable women, particularly through more intimate means (e.g., stabbing and strangulation; Daly & Wilson, 1988; Dobash et al., 2004; Mize et al., 2011; Shackelford et al., 2000; Wilson et al., 1995); and (4) evidence of counterstrategies deployed by women to avoid uxoricide, such as killing male partners in self-defense or killing men who have previously perpetrated in-pair violence toward them (discussed in Duntley & Shackelford, 2012).

C23.P24

C23.P23

Nonetheless, uxoricide may best qualify as an evolutionary byproduct rather than the designed behavioral output of an adaptation. There are good reasons to believe that uxoricide might detract from, rather than contribute to, men's fitness in both ancestral and modern environments. Killing one's intimate partner would likely have been, and currently is in many modern cultural contexts, a high-risk strategy associated with recrimination and social exclusion by community members (Daly & Wilson, 1988; Wilson et al., 1995). Furthermore, uxoricide may signal to other potential mates that an individual male is psychologically unstable and, therefore, not a suitable relationship partner. This would likely harm men's reproductive success, particularly considering the importance

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heterosexual women ascribe to emotional stability as a key mate preference criterion in long-term relationships (Shackelford, Schmitt, et al., 2005). Indeed, the perpetrators of uxoricide are significantly more likely to have been diagnosed with personality disorders (reviewed in Dutton & Kerry, 1999). Although rare, the occurrence of suicide following uxoricide (i.e., uxoricide-suicide; Liem et al., 2009) would obviously preclude men from establishing new mateships, as well as producing and investing in offspring.

Intrasexual Homicide

C23.S10 C23.P25

Infidelity-related killings are not limited to the romantic partner, but can also extend to killing of the mate poacher. Homicide involves the killing of another with the intent to cause serious bodily harm or death (WHO, 2017b). Across the globe, 464,000 individuals are victims of homicide annually, according to data from 2017 (UNODC, 2019c), meaning that the global homicide rate is 6.1 for every 100,000 individuals (UNODC, 2019c). The most frequently victimized demographic are males between the ages of 15 and 29 years, though age trends for victimization are comparable between the sexes (UNODC, 2019d). Attesting to this, the WHO (2017a) reported that the global male population is victimized at a rate of 10.3 homicides per every 100,000, whereas the global female population is victimized at a rate of 2.4 homicides per every 100,000. Furthermore, approximately 90% of all recorded homicides are perpetrated by males (UNODC, 2019c).

Researchers have consistently demonstrated that as the severity and risky nature of aggressive interpersonal behavior increases, males are significantly more likely to be the perpetrators, particularly in regard to same-sex homicide of unrelated conspecifics (Archer, 2009; Daly & Wilson, 1990; Goetz, Shackelford, Romero, et al., 2008). Indeed, several homicide cases have shown how men catching their female partners in the act of infidelity results in the male lover being killed in a crime of passion (Buss, 2000). For example, researchers have studied specific typologies of male–male violence, such as the killing of a female mate's new male partner. Approximately 10% of male–male homicides in Japan during the years 1950 and 1960 were motivated by sexual jealousy (10.6% and 9.9%, respectively; Hiraiwa-Hasegawa, 2005). Unsurprisingly, sexual jealousy has been argued and shown to be a key motivating factor in men's killing of same-sex rivals that threaten the integrity of their mateships and who increase the risk of paternity uncertainty (Arnocky & Carré, 2016; Buss, 2013; Daly & Wilson, 1988; Davis et al., 2016; Duntley

C23.P26

C23.P27

& Buss, 2005).

In some instances, when a person murders another as a result of sexual infidelity (e.g., finding a spouse committing acts of sexual infidelity in the moment), there are laws that sympathize with the perpetrator. For example, Philip Barton Key was murdered by Daniel Sickles in 1859, as a result of Key's affair with Sickles's wife (Keetley, 2008). In this case, Sickles was acquitted because his action was judged to be the result of an "uncontrollable instinct." In Canada, an individual can have a murder charge reduced from murder to manslaughter if they killed another in the heat of passion because of provocation,

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providing partial defense (Dayan, 2018). The defense of provocation is also used in other countries, like in the Commonwealth Caribbean (Wheatle, 2016). However, there are criticisms of this legal "provocation" defense, and some scholars and advocates wish to abolish the law. Some countries have followed this scholarly advice (Grant & Parles, 2017; Wheatle, 2016) and, as a consequence, this defense has been removed in some jurisdictions, such as in Australia (which has implemented the offence of defensive homicide; Fitz-Gibbon & Pickering, 2012), and in the United Kingdom. The United Kingdom has replaced the aforementioned defense with an alternative: loss of control. This defense is an attempt to target the gendered operation of the provocation defense. Whereas the provocation defense allowed sexual infidelity to partially excuse the act of homicide, the "loss of control"' defense does not allow for such a justification in IPH cases. Of note, the current state of this legal defense may change as there is case law attempting to make sexual infidelity a mitigating factor once more (Horder & Fitz-Gibbon, 2015; Kesserling, 2016; Slater, 2012; Wake, 2012). Meanwhile, other countries continue to uphold this legal defense (see, for example, Dressler, 2002; Gruber, 2015). The motivating factor of infidelity in male-male homicide is also evidenced by studies of hypothetical scenarios involving individuals who have not committed a crime. Miller and Maner (2008) asked undergraduate students to write about their anticipated reactions to an imagined infidelity. In response to partner infidelity, men reported they would experience stronger feelings of anger and a greater propensity for violence than women. Compared to women, men also reported being significantly more likely to perpetrate violence against the interloper than against their romantic partner.

C23.P28

Several lines of evidence converge to illustrate how same-sex violence, such as homicide, in response to infidelity may be adaptive. There is evidence that in many primate species, males violently attack and sometimes kill same-sex conspecifics if they encroach on their mating territory or attempt to copulate with mated females in both polyandrous and monogamous mating systems (discussed in French et al., 2018). In humans, samesex violence and homicide to compete for mates and in response to suspected or actual infidelity has also been observed in many different cultures and across time (Blake & Denson, 2017; Daly & Wilson, 1988). These acts have plausible direct functions as an anticuckoldry tactic to reduce the likelihood of siring genetically unrelated offspring and as a mate retention tactic to remove intrasexual competitors from the mating arena (Buss, 2002, 2013; Kaighobadi et al., 2012). Homicidal ideation and violent retaliation (including same-sex homicide) are also reliably predicted by men's sexual jealousy, anticipated partner infidelity, and women's past infidelity (Buss, 2000, 2006, 2013; Duntley & Buss, 2005). There also appear to be antihomicide defenses that function as counterstrategies to reduce the likelihood of being killed by conspecifics, such as avoiding situations where stranger homicide may be more likely to occur (e.g., lower socioeconomic areas and dark alleys; see Duntley & Shackelford, 2012).

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C23.P29

Nonetheless, similar to uxoricide, killing conspecifics is a very risky strategy that may inhibit, rather than promote, men's reproductive success. As a highly social species that evolved in small nomadic hunter-gatherer communities (Richerson & Boyd, 1998), it is likely that men killing same-sex group members over suspected infidelity would have been met with strong disapproval, and would signal to available mates that an individual is dangerous and potentially psychologically unstable (Daly & Wilson, 1998; Wilson et al., 1995). The same could be said in most developed modern circumstances where homicide is met with legal consequences and public disapproval. However, in patriarchal cultural contexts wherein men are able to subjugate and acquire dominion over women, it is possible for men to kill in a more religiously and socially "acceptable" manner (e.g., honor killings; Buss & Shackelford, 1997b; Wilson & Daly, 1996). Perhaps in these settings men could experience heightened reproductive success, but this again casts some doubt on the idea that men's same-sex homicide is universally adaptive.

Filicide

C23.S11 C23.P30

Filicide is the act of a parent killing their child. Researchers have further operationalized the constructs of neonaticide (i.e., the killing of a newborn on the first day of life) and infanticide (i.e., the killing of a genetically related or unrelated infant during their first year of life by conspecifics). Filicide is also a well-documented phenomenon occurring across diverse cultural contexts and throughout time (Adinkrah, 2003; Almeida & Viera, 2017; Friedman et al., 2012; Hrdy, 1999; UNODC 2019e). In Canada, the vast majority of child homicide victims are killed by a family member. Usually this family member is a parent, and this pattern of results has been quite consistent (e.g., in Canada since Statistics Canada began reporting these values in the mid-1970s; Statistics Canada, 2009). Of the children killed annually in the United States, parents are responsible for an estimated 61% of murders of children under the age of 5 years (Friedman et al., 2005), and similar rates have been cited for the United Kingdom (see Martin, 2006). On average, 450 children are murdered by their parents each year in the United States and about 30 in Canada (Statistics Canada, 2009). Sometimes, there is a combination of murder and suicide in filicide cases. When considering filicide broadly, men appear to be the perpetrators more often than women. In Canada, data collected from 1997-2006 shows that the perpetrating parent is typically the father rather than the mother (Statistics Canada, 2009). However, there appear to be important differences in terms of the victim's age. Empirical work indicates that mothers commit neonaticide far more often than fathers (Fox & Fridel, 2017; Goetting, 1988) and that this pattern seems to reverse in cases of filicide involving older children (Kunz & Bahr, 1996). These fathers committing filicide also tend to have lower socioeconomic standing (Campion et al., 1988; Marleau et al., 1999) and use more violent means of perpetrating the act (e.g., stabbing; Marleau et al., 1999).

C23.P31

Researchers have outlined at least five underlying motives for filicide, one of which includes spousal revenge perpetrated primarily to cause harm to one's partner. Ostensibly

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this could relate to infidelity, yet we are unaware of empirical data on whether suspicion or confirmation of infidelity, or of discovery of cuckoldry, serves as a reliable impetus for violence against the offspring. Nevertheless, sexual jealousy and sexual infidelity have been invoked by many authors as key motivating factors in contributing to paternal filicide (Adinkrah, 2003; Archer, 2013; Daly & Wilson, 1984, 1988; Friedman et al., 2012; West, 2007). In support of this idea, there have been highly publicized cases which provide anecdotal evidence that some men cite infidelity as a reason for killing their children. News reports of different cases containing statements like "A Tennessee man is accused of beating a 4-month-old baby to death after discovering that he wasn't the infant boy's father" (Georgantopoulos, 2019), "A man is due to be sentenced today for killing a baby boy when doubts emerged over whether or not he was the father" (Hartley-Parkinson, 2019), and "A hospital radiographer was jailed for life for murdering his three-year-old daughter . . . after discovering sexually explicit emails sent by his wife . . . to a part-time judge whom she had met on the internet" (Martin, 2006) are easy to find among international news headlines. Such cases are not limited only to responses to infidelity. One news report noted, "A Colorado father was sentenced to three consecutive lifetimes in prison after . . . [planning] . . . the August murders of his pregnant wife and two young daughters—apparently in the hope of starting a new life with his girlfriend" (Selk, 2018).

C23.P32

C23.P33

From an evolutionary perspective, discontinuing investment in offspring when confronted with information that one is not the biological father makes sense. Killing that offspring might simultaneously punish one's female partner, reducing her reproductive success and the success of an intrasexual rival—behavior that is seen in some other mammalian species, such as lions and various primates, as well as many species of insects, amphibians, fish, and birds (e.g., Hrdy, 1979; Smuts & Smuts, 1993). Yet in humans, there are inherent risks to using such behavior, including ambiguity of potentially eliminating one's own offspring and the retaliation by others in the social group. For men, a key proposed direct function of filicide is the avoidance of investing limited resources in genetically unrelated offspring when faced with high levels of paternal uncertainty (Daly & Wilson, 1988, 2008; West et al., 2009).

Moreover, step-parents who do not share a genetic relationship with their offspring are significantly more likely to kill children within the family structure than are genetic parents and they tend to use methods of killing that are less immediate that thus produce more pain (e.g., beating and bludgeoning; Daly & Wilson, 1994; Weekes-Shackelford & Shackelford, 2004). Partner revenge has also been shown to be an important motivating factor for paternal filicide, particularly in response to infidelity, relationship dissolution, and loss of custody (Palermo, 2003; Resnick, 2016; West, 2007; West et al., 2009). It is possible that this behavior could function to deter a female partner's sexual infidelity, perhaps even as an extreme means of punishing a mate's infidelity threat (a key cost-inflicting form of mate retention; Barbaro et al., 2015; Starratt et al., 2007).

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C23.P34

Conversely, some scholars have posited that male infanticide could be an exaptation of men's aggressive intrasexual rivalry (Bartlett et al., 1993). Some data support this idea. For instance, aggressive men are more likely to engage in spousal homicide and filicide (reviewed in Palombit, 2015). Nonetheless, currently it seems to be an inadequate hypothesis given how highly goal-directed, context-specific, and patterned infanticide is among humans and nonhuman animals (West, 2007). Furthermore, the "byproduct" argument for infanticide in response to infidelity does not adequately address observations of maternal filicide in response to infidelity (Friedman et al., 2012).

C23.P35

However tempting it may be to make adaptive conclusions about filicide based on these case examples, the reality is that "spousal revenge," as the motive underlying filicide which seems to best fit with real or suspected infidelity, appears to be rare compared to other reasons, such as altruistic killing and acute psychosis (Resnick, 1969). Moreover, some studies show that mothers rather than fathers are more likely to kill younger children, especially between the ages of 1 and 4 years. There is no genetic reason why infidelity would bear on women's willingness to invest in a child, since they are not susceptible to cuckoldry. One could speculate that perhaps the threat of loss of male resources or desire to attract a new mate (which could be inhibited by a child) might bear on this behavior in women. Indeed, anthropologists have noted that in some cultures filicide is directly linked to the availability of resources, and the likelihood of that offspring being able to attract important resources. One of the most striking examples of this link can be found in the anthropological literature on Inuit populations. In the early 20th century, it was noted that Inuit women would kill their children by way of freezing, drowning, or suffocation, under the "stress of unbearable economic conditions" (Garber, 1947). In these circumstances, female infants were far more likely to be killed than male infants, ostensibly because "boy babies will grow up to become producers and providers" (Garber, 1947). Poverty and a lack of resources, coupled with child characteristics that confer greater burden or threat to survival have been cited in contemporary societies as explanations of infanticide as well (e.g., Friedman et al., 2012; Hilari et al., 2009). Some studies have linked the likelihood of being a lone parent to infanticide; especially when social, economic, and cultural influences hinder a woman's ability to raise a child alone (e.g., Friedman et al., 2012; Rattigan, 2012). To the extent that a male's infidelity could result in his abandonment of his partner and offspring, the loss of those resources could function as a tipping point for the viability of the offspring toward the mother's reproductive fitness. Nevertheless, there is little empirical evidence directly linking filicide to infidelity. In Croatia, Marcikić et al. (2006) found evidence of fear of infidelity being discovered by a husband, along with socioeconomic hardships, as motivating factors for infanticide. Similarly, Friedman and Resnick (2007) note that women's spousal revenge filicide "most often occurs after learning of spousal infidelities or in the course of child custody disputes" (p. 139). Future researchers should seek to more thoroughly investigate putative links between infidelity and filicide.

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Social-Cognitive and Emotional Adaptations Linked to Infidelity and Violence

Sensitivity to Cues of Partner Infidelity

Given the adaptive challenges associated with a partner's infidelity (e.g., cuckoldry), researchers have argued that humans have evolved a constellation of perceptual, cognitive, and affective mechanisms that operate to gauge looming threats that infidelity may transpire and to detect that infidelity has occurred (Andrews et al., 2008; Buss, 2002; Shackelford & Buss, 1997). For instance, researchers have identified that perception of a romantic partner's actions may serve as a cue to emotional and sexual infidelity in a long-term partner, such as reluctance to spend time with, acting guilty/anxious toward, and sexual disinterest/ boredom with one's mate (Shackelford & Buss, 1997). Another strong predictor of future partner infidelity is whether that individual has committed infidelity in the past (Baker & Bellis, 1995). Other researchers have focused on more subtle cues, such as perceptions of vocal pitch. Women perceive men with more masculine (low-pitched) voices as more likely to be unfaithful than men with more feminized voices, whereas men perceive women with more feminine voices as being more likely to be unfaithful in comparison to women with more masculinized voices (O'Connor et al., 2011). Interestingly, women who more often rate men with lower voice pitch as likely to commit infidelity are more likely to prefer these men as short-term sexual partners, as opposed to long-term romantic partners (O'Connor et al., 2014). Furthermore, some researchers have shown that individuals accurately rate the vocal pitch of those who have previously committed infidelity as more likely to have been unfaithful (Hughes & Harrison, 2017; Schild et al., 2020). Importantly, there are sex differences in the monitoring tendencies and the accuracy of infidelity inferences that correspond to the divergent adaptive problems that have differentially impinged on women's and men's reproductive success over their evolutionary histories, as we discuss next.

C23.P37

C23.S12

C23.S13

C23.P36

Evolutionary scholars have argued that the costs of failing to detect a partner's infidelity would have been more detrimental to the reproductive success of ancestral men relative to ancestral women because of men's paternity uncertainty (Andrews et al., 2008; Kruger et al., 2015). Men would, therefore, benefit more by falsely assuming infidelity (a false-positive), because the opposite act of failing to detect a true infidelity (a false-negative) could lead to cuckoldry. This phenomenon, grounded within error management theory, has been termed the "infidelity overperception bias" (see Goetz & Causey, 2009). Indeed, heterosexual men have been shown to be more suspicious of a partner's potential future sexual infidelity (Goetz & Causey, 2009), even when their partners say that they have been faithful (Andrews et al., 2008). Men also appear to be more accurate in their inferences of infidelity than women (Brand et al., 2007; Andrews et al., 2008). Further, there is some evidence that women may have difficulty in detecting male sexual infidelity. In one study of adults living in economically disadvantaged communities in India, 22% of men had reported extramarital sex, yet only 6% of wives reported knowledge of these sexual liaisons (Schensul et al., 2006). Nonetheless, because of the heightened likelihood of IPH

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faced by women over suspected and actual sexual infidelity (Wilson & Daly, 1988), selection has likely favored more effective ways of hiding and disguising cues to infidelity among women as adaptive counterstrategies (Duntley & Shackelford, 2012).

Through the rivalry sensitivity hypothesis, it has also been suggested that women and men may have evolved different detection strategies and sensitivities to cues and sources of infidelity (Ein-Dor et al., 2015). Specifically, women focus their attention on threats to infidelity from potential rivals (other women), compared to men who focus on monitoring their own partner's intents to commit infidelity (Ein-Dor et al., 2015). Women were more likely than men to state that an ambiguous gaze from an attractive same-sex stranger was threatening (i.e., a "zone defense"; Ein-Dor et al., 2015). This demonstrates that the focus of women's sensitivity to threats is on potential rivals, arguable because women lack the capacity to physically dominate (and thus prevent infidelity by) their partner. Conversely, men were more likely to appraise gazes of their own partners toward strangers as threatening, demonstrating sensitivity to within-couple threats (i.e., a "person-to-person defense"; Ein-Dor et al., 2015). An alternative explanation of these findings might be that because men are generally less discriminating in their mate choice (especially for short-term affairs), that female interest in one's partner represents a greater threat than the reverse, given that women likely receive much more attention from potential suitors than men. Consequently, a more efficient strategy for males would be to monitor the partner rather than all male rivals. According to evolutionary psychologists, information that signals a reproductive threat should then promote an affective response, which in turn would elicit an appropriate behavioral outcome (see Arnocky et al., 2012, for review). Indeed, knowledge or suspicion of infidelity has been robustly linked to a constellation of emotions including jealousy and anxiety, which in turn appear to motivate violence in some circumstances.

C23.S14 C23.P39

C23.P38

Emotional, Sexual, and Morbid Jealousy

Evolutionary scholars argue that romantic jealousy functions to promote actions aimed at retaining one's mate, such as being vigilant to the presence of intrasexual rivals (Albert & Arnocky, 2016; Arnocky et al., 2012; Buss, 2002; Davis et al., 2018). In support of its adaptive utility, researchers have observed sex differences in the types of infidelity that are most strongly tied to jealousy, which map on to the specific adaptive challenges likely faced by ancestral women and men. As described earlier in this chapter in the section on IPV, men face the adaptive challenges of paternal uncertainty and cuckoldry in relation to women's sexual infidelity. Males tend to be more upset and likely to express sexual jealousy if their partner commits sexual infidelity, referring to sexual activity with someone other than one's long-term partner (Buss, 2013; Davis et al., 2016; Kruger et al., 2015; Shackelford & Buss, 1997). In contrast, women face the adaptive challenge of securing and retaining male physical protection, provisioning, and paternal investment for their offspring. Men's emotional infidelity (i.e., establishing a strong emotional attachment

with someone outside the mateship), therefore, is particularly distressful for women and elicits their emotional jealousy.

C23.P40

Across varied samples and methods, meta-analytic work supports the hypothesis that heterosexual men experience more psychological distress than women over a partner's sexual infidelity, whereas the opposite pattern has been documented in regard to a partner's emotional infidelity (see Edlund & Sagarin, 2017). These sex differences in jealousy have proven replicable across cultures that significantly differ socially, economically, and politically, including China, Japan, Chile, Spain, Romania, Ireland, Sweden, and The Netherlands (Buss, 2018). There is also evidence that these sex differences occur in response to the actual experience of infidelity (Edlund & Sagarin, 2017). Similar findings have also been reported for heterosexual women and men expressing morbid jealousy, denoting an excessive and delusional experience of jealousy over suspected infidelity (Easton et al., 2007). This sex difference does, however, appear to be more pronounced among heterosexual couples and attenuated among homosexual partners (Harris, 2003). Results are more mixed when considering women's and men's physiological reactions to infidelity. Some have supported the predicted sex difference in distress over sexual and emotional infidelity (e.g., Buss et al., 1992), whereas other scholars have found that men generally show greater physiological activity to sexual compared to emotional imagery even in the absence of infidelity cues (Harris, 2000).

There also appears to be a corresponding sex difference in forgiveness of infidelity. Men report being more likely to break up with their partner if she has committed a sexual infidelity compared to emotional infidelity, whereas the reverse was true of women (Shackelford et al., 2002). In a situation where participants were told to imagine that both sexual and emotional aspects of an infidelity were involved, the majority of men indicated that the sexual aspect would be the most difficult to forgive (Shackelford et al., 2002). Perhaps the tendency for males to overperceive and fail to forgive sexual infidelity has implications for the perpetration of violence as a means of curtailing such threats (see chapter 10 for a more thorough discussion of sex differences in jealousy).

C23.P42

C23.P41

Understanding sex differences in sexual jealousy is important because of the abundance of evidence linking male sexual proprietariness and jealousy to partner-directed violence in the face of real, suspected, or anticipated infidelity (Buss & Duntley, 2011; Daly et al., 1982). Wilson and Daly (1996) have noted that men's antipathy for female infidelity and attempts to leave the relationship resoundingly underlies violence toward, and killing of, women. Victims and perpetrators ascribe men's violent and autonomy-limiting behavior toward women as most frequently motivated by jealousy (see Wilson & Daly, 1996 for review). Easton and Shackelford (2009) found that morbidly jealous men, more than women, used physical violence, attempted to kill, and actually killed their romantic partners. In another study looking at the emotional reactions to infidelity, men, compared to women, provided higher ratings for emotions surrounding feeling homicidal and suicidal (Shackelford et al., 2000). Sex differences in infidelity-related emotions have also been

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explored at the neural level. One study found that compared to neutral situations, during situations which evoked jealousy, men showed greater activation than women in the brain regions involved in sexual/aggressive behaviors such as the amygdala and hypothalamus (Takahashi et al., 2006). This provides support for the idea that men and women may have different neuropsychological modules to process sexual and emotional infidelity.

C23.SI5 Anxiety and Anxious Attachment

C23.P43

Parallel to work on jealousy, researchers have also recognized anxiety (i.e., worry and apprehension of things to come) as a core component of sexual proprietariness, such that the "threat of losing one's mate to a rival evokes jealousy that includes not only anxiety but also seeking of reassurance and aggression to try to avert loss" (Marks & Nesse, 1994, p. 252). Indeed, anxiety has been linked to the perpetration of aggression in humans and other species (see Arnocky, Sunderani, Gomes, et al., 2015, for review). Baumeister and Tice (1990) argued that anxiety evolved in part to facilitate the maintenance of important relationships by promoting corrective action in the face of social exclusion (see Buss, 1990). Rodriguez et al. (2015) found that anxious individuals reported more jealousy when they were less trusting of their partner and that low trust predicted perpetration of nonphysical partner violence (e.g., making fun of the partner and screaming at the partner) more among anxious individuals. Like jealousy, one's mate value also appears to interact with the experience of anxious emotions. For instance, Phillips (2010) found that women and men lower in mate value reported greater insecurity and anxiety in response to a partner's infidelity.

C23.P44

In spite of the vast body of research implicating jealousy concerning violence related to real or suspected infidelity, there is relatively limited empirical work wherein these relations are statistically modeled. If negative affect serves the adaptive function of motivating behavioral responses to information about reproductive threats, then we can expect variables such as jealousy and anxiety to mediate the links between infidelity (reproductive threat) and aggression (behavioral response). Arnocky, Sunderani, Gomes, et al. (2015) explored whether anxiety mediated links between anticipated partner infidelity and the perpetration of IPV in a sample of undergraduate men. They found that symptoms of anxiety mediated relations between anticipated partner infidelity and physical aggression, partner injury, psychological aggression, and sexual aggression toward a partner. These studies provide initial evidence that negative affect likely mediate links between cues to a reproductive threat, such as infidelity, and aggressive reactions to such threats.

C23.P45

Evolutionary scholars have also implicated the role of anxiety in people's romantic attachment orientations, which putatively function to coordinate cognitive, affective, and behavioral responses to relationship threats such as infidelity and relationship dissolution (see Barbaro et al., 2016). Specifically, attachment anxiety embodies feelings of insecurity in a romantic relationship, encouraging hypervigilance to relationship threats and an excessive dependence on one's partner for assurance. Individuals with anxious attachments

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are prone to consider a wider range of behavior as signaling infidelity (Kruger et al., 2013), express more jealousy (Kim et al., 2018), and deploy cost-inflicting mate retention at a higher frequency (Barbaro et al., 2016). Men and women with an anxious attachment are also more likely to psychologically aggress against, physically assault, and sexually coerce their romantic partners (Barbaro & Shackelford, 2019). Using path analysis to model the direction of effects and to infer causal relations, Barbaro et al. (2019) found that anxious attachment positively predicted heightened perceptions of future infidelity, which explained women's and men's use of cost-inflicting mate retention. Collectively, these studies provide important evidence that negative trait and attachment affectivity mediate the links between cues to a reproductive threat, such as infidelity, and aggressive reactions to such threats.

Individual Differences in Violence

Mate Value

On the mating market, women and men who are lower in mate value are competitively disadvantaged, which places them at a greater risk of partner infidelity or mate defection (Miner, Starratt, et al., 2009). Mate value embodies a constellation of factors such as kindness, honesty, physical attractiveness, and loyalty, several of which vary in importance according to biological sex. Women tend to value indicators of resource holding potential (e.g., status, ambition, and wealth) and physical formidability in a partner more than men, whereas men tend to desire cues to health, reproductive value (e.g., youth, physical appearance), and parenting ability in a partner more than women (Fisher et al., 2008; Shackelford, Schmitt, et al., 2005). Evolutionary scholars have posited that individuals of lower mate value should be more likely to resort to more high-risk and damaging (i.e., cost-inflicting) forms of mate retention. In support of this idea, Graham-Kevan and Archer (2009) found that both women and men with lower mate value were more controlling and more physically aggressive toward their partners. Similarly, Davis et al. (2019) found that poorer reported physical health (a putative marker of lower mate value), corresponded to engaging in more cost-inflicting mate retention among women and men. Sela et al. (2017) found that individuals who perceived themselves to be more replaceable relative to their mates and less likely to be able to replace their partners (i.e., a mate value discrepancy), were more likely to perform both cost-inflicting and benefit-provisioning acts (e.g., gift giving, complimenting one's partner, and going out to expensive restaurants).

C23.P47

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C23.P46

Although relevant to both sexes, men, like the males of most other mammals, have greater reproductive variability than women (i.e., Bateman's principle). Therefore, men of lower mate value are predicted to have a vested interest in retaining their partners at whatever the cost. Women are also more frequently the targets of men's mate poaching efforts (Sunderani et al., 2013), suggesting, again, that lower mate value men may have to guard their partners more vigorously and resort to cost-inflicting tactics more often than

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their higher mate value same-sex counterparts. Miner, Shackelford, et al. (2009) showed that lower mate value men used more partner-directed verbal aggression in comparison to higher mate value men. Furthermore, Miner, Starratt, et al. (2009) found that men higher on mate value used healthier, positive, and less risky mate retention (i.e., benefitprovisioning acts) and fewer cost-inflicting forms of mate retention toward their female partners. Taller men who are generally regarded as more attractive by women (i.e., higher mate value) have also been shown to exhibit lower jealousy than their shorter counterparts (Brewer & Riley 2009; Buunk et al. 2008). Moreover, Buunk and Massar (2019) found in a sample of men from Nicaragua that lower mate value predicted increased perpetration of IPV. Danel et al. (2017) found that women who reported their own mate value as being significantly higher than their male partner's (i.e., a mate value discrepancy) also reported more controlling behavior by their partners. Nonetheless, aggression and IPV in relation to low mate value is not limited to men. In a sample of over 500 women who were currently in heterosexual relationships, Arnocky et al. (2012) found that women who perceived themselves as less physically attractive than other women (i.e., lower in mate value) engaged in more relational aggression toward their partners. Importantly, women's mate value also varies predictably over development and cyclically across the phases of the menstrual cycle, which evolutionary scholars predict to influence the likelihood of infidelity and men's mate retention efforts (Gangestad et al., 2002; Pillsworth & Haselton, 2006).

C23.S18 C23.P48

Differences in Fertility Status and Reproductive Value

As stated in the section on IPH, younger women are higher in reproductive value than their older same-sex counterparts and face a higher risk of uxoricide (Daly & Wilson, 1988; Mize et al., 2011). Younger women are also more likely to experience vigorous mate retention efforts by their male partners, including greater surveillance and controlling behavior (Buss & Shackelford, 1997; Graham-Kevan & Archer, 2009; Shackelford et al., 2000). Women's fertility status has also been found to predict men's mate retention behavior. For instance, in a Caribbean village, men who were partnered with pregnant women (who were thus not at present risk of impregnation by another male) spent less time with, and were less aggressive toward, their partners in comparison to men whose partners were fecund (i.e., capable of producing offspring; Flinn, 1988). Furthermore, women's fertility shifts significantly across the phases of their menstrual cycles, peaking during the periovulatory phase, and evidence suggests that men can detect subtle changes in women's fertility status across the cycle (Haselton & Gildersleeve, 2011). Consequently, men self-report and women report that their partners engage in more mate retention behavior around ovulation (Gangestad et al., 2002; Pillsworth & Haselton, 2006). Individual differences are but one source of variance underpinning responses to infidelity. Social and ecological parameters have also been shown to influence how people respond to real or suspected infidelity.

C23.S19 C23.P49

Social-Ecological Contexts Influencing Responses to Infidelity

Across varied disciplines and subdisciplinary branches of study, many researchers have inappropriately argued that either individual differences or social-cultural processes account for perceptions of infidelity and IPV, particularly when examining the sex- and gender-differentiated aspects of these relations. However, human psychology manifests through a confluence of proximate (i.e., immediate) and ultimate (i.e., distal) mechanisms, underscoring the necessity of studying physiology, attitudes, values, emotions, personality, demographic characteristics, development, socialization practices, societal structures, features of the physical environment, ecology, and phylogeny in trying to understand how (a proximate question) and why (an ultimate question) infidelity and IPV occur (Brown et al., 2018; Daly, 2014; Goetz, Shackelford, & Camilleri, 2008; Ward & Siegert, 2002). One cultural-level variable that has received a significant amount of attention from researchers, relates to societies wherein men control a disproportionate amount of power over women (i.e., patriarchal cultures).

C23.S20 Patriarchy and Cultures of Honor

C23.P50

Sociocultural researchers have highlighted the importance of the internalization of masculine ideologies that are more prevalent in patriarchal cultures when attempting to comprehend male-perpetrated IPV in response to infidelity (Brown et al., 2018; Brown & Osterman, 2012; Osterman & Brown, 2011). In these cultures, individual men tend to seek power and dominion over women and are more likely to treat them as sexual objects. One example is cultures of honor-contexts within which individuals feel obligated and emboldened to protect their reputations. In such cultures, men internalize norms through socialization processes where women are viewed as conquests, which becomes linked to men's sexual proprietariness (Buss & Shackelford, 1997b; Daly & Wilson, 1988; Wilson & Daly, 1996). Therefore, from sociocultural and evolutionary perspectives, we should expect men in honor cultures to feel more justified in expressing deleterious forms of jealousy (e.g., possessive jealousy) and engaging in a greater frequency of IPV as a reputation management strategy when threats to their honor are triggered. Several researchers have shown how men living in cultures of honor are more tolerant of male jealousy and male perpetrated IPV in comparison to men who have not been socialized by these cultures (Vandello et al., 2009). Brown et al. (2018) also showed that in American states with a stronger culture of honor, there were higher rates of rape, physical dating violence, and economic deprivation. On the point of economic deprivation, evolutionary scholars have emphasized how situations of resource scarcity are predicted to engender more risky, damaging, and violent intrasexual competition and intergroup aggression among conspecifics for access to those limited resource (Allen et al., 2016; Cox, 2008; Daly & Wilson, 1988).

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C23.S21 C23.P51

Income Inequality, Resource Scarcity, and Environmental Unpredictability

Conflict arises among individuals when there is variability in the ability to access, defend, and secure limited resources that contribute to survival or reproductive success, whether it is food, shelter, or mates (Daly & Wilson, 1990). Evolutionary investigators have convincingly shown that one of the best predictors of aggression and violence (e.g., homicide and IPV) is income inequality, wherein those with fewer resource, such as those in poverty, compete more fiercely when they feel like there is nothing to lose because the benefits of violence outweigh the potential costs (Balci & Ayranci, 2005; Daly & Wilson, 1988; Daly et al., 2001; Flynn & Graham, 2010). Both women and men in situations typified by income inequality increase their intrasexual rivalry in sex-specific ways that correspond to the adaptive challenges faced by ancestral women and men. For women, poverty may engender more self-promotion to attract mates (e.g., emphasizing cues to promiscuity), competitor derogation to lower the mate value of rivals, as well as competition for access to men who are capable of providing resources and parental investment (Blake & Brooks, 2019; Campbell, 1999). In these situations, women may be more likely to commit infidelity to acquire better quality sexual and romantic partners (Cox, 2008). In slight contrast, men in these situations may increase their violent tendencies to retain romantic partners, fight off rivals, and remove competitors from the mating arena (i.e., homicide), and due to an inability to attract and maintain mateships through selfpromoting cues to resource holding, status, and parental investment (Daly, 2017; Daly & Wilson, 1988).

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C23.S22

C23.P54

Evolutionary scholars have pointed to environmental unpredictability (i.e., the degree of fluctuation and stochasticity in early developmental environments) as another important contextual variable that influences perceptions of infidelity and more violent forms of mate retention behavior. For example, Barbaro and Shackelford (2019) showed that retrospective accounts of unpredictability in childhood were linked to IPV (e.g., physical assault), which was explained (i.e., mediated) by anxious attachment. However, this effect was significantly stronger for men in comparison to women, perhaps because men may benefit from riskier reproductive strategies than women as a consequence of women's greater obligatory parental investment.

Another salient cue to resource scarcity is the relative number of sexually available mates within a population in a particular geographic location (i.e., the operational sex ratio; Arnocky et al., 2016).

Sex Ratios and Perceived Mate Availability

Infidelity rates and intentions have been linked to population operational sex ratios largely within the context of female-biased regions (i.e., more reproductive-aged women relative to men) exhibiting a more unrestricted sociosexual orientation relative to male-biased (i.e., more reproductive aged men relative to women) regions (Schmitt, 2005).

This effect has also been observed experimentally. Arnocky et al. (2016) found that men primed with perceived mate abundance exhibited less restricted sociosexual attitudes and more intended infidelity relative to men primed with perceived mate scarcity. In another study, individuals who were primed with the same mate-availability scenarios also exhibited increased intrasexual competitiveness, jealousy, and indirect and physical (men only) aggression toward a hypothetical mate poacher when primed with mate scarcity versus abundance (Arnocky et al., 2014). This suggests that whereas perception of mate abundance may promote infidelity, perceptions of mate scarcity may promote effort aimed at preventing partner defection.

Conclusions and Future Research Directions

Human mating relies largely on the provision of reproductively relevant resources by relationship partners. Infidelity represents an important threat to this process, introducing risk of cuckoldry, diversion of physical and emotional resources, and potential dissolution of the mateship and abandonment of offspring. Accordingly, evolutionary psychologists have argued that humans have evolved a suite of perceptual, cognitive, affective, and behavioral traits which serve, in part, to counteract the threat of infidelity. Some of the most devastating of these include various forms of IPV (e.g., rape and uxoricide, homicide, and filicide). These actions, though repugnant, may have facilitated ancestral reproductive fitness via their functions related to deterring infidelity or defection, isolating the partner, punishing infidelity to reduce its future occurrence, eliminating the competition, competing with other men's sperm, or eliminating the partner or resultant children who do not pose strong likelihood of passing on one's genes. Sex differences in these violent actions may reflect the differential risks associated with resource loss versus cuckoldry and acquisition of new partners which vary between men and women, along with the risk associated with violence perpetration, which is inherently more detrimental to women than it is to men. Varying degrees of evidence have linked men's sexual proprietariness to these vicious and unconscionable acts, suggesting that jealousy and related emotions such as anxiety play an important role in promoting these actions in response to a real or perceived infidelity. Moreover, individual differences, such as mate value, as well as socialecological factors, including cultures of honor, income inequality, and mate scarcity, may play a role in moderating these links.

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Despite the power of an evolutionary perspective in delineating why individuals engage in violence in response to suspected or actual infidelity, the sex-differentiated aspects of the behavior, and the moderating factors engendering same-sex and partnerdirected abuse and the killing of offspring, there are still many areas in need of further investigation. For instance, there is ongoing debate regarding whether the physiological and psychological mechanisms underpinning violent behavior over infidelity actually constitute adaptations or exaptations (e.g., rape). Concrete evidence is needed regarding actual outcomes linked to reproductive success concerning sexually coercive behavior,

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including rape. Similarly, there is little evidence supporting the notion that various forms of cost-inflicting mate retention (e.g., IPV) work to retain desired partners and whether the reproductive benefits of the behavior outweigh the potential costs. Contextual factors such as perceptions of mate availability or resource availability would also benefit greatly from examining potential links to mate retention and violence. For instance, one could administer a mate availability or resource availability priming manipulation and examine subsequent attitudes toward mate retention effort and partner violence. Several researchers have linked vocal pitch to perceptions of infidelity (e.g., O'Connell et al., 2014; O'Connell et al., 2011); however, few scholars have examined the associations between vocal pitch in relation to actual infidelity outcomes (see Hughes & Harrison, 2017; Schild et al., 2020). There exists an even larger gap in the literature regarding the relations between vocal pitch and mate retention behavior, which would contribute to extant literature on perceptual threat detection and behavioral responses to potential infidelity. Similarly, many researchers have shown how particular characteristics in intrasexual rivals elicit women's and men's jealousy and suspicions of infidelity (e.g., Buss et al., 2000; Dijkstra & Buunk, 2002); however, few scholars have modeled how these characteristics then promote mate retention behavior in response to looming infidelity threats (Nascimento & Little, 2019). Researchers have also begun to examine different forms of cyber IPV from an evolutionary perspective; although, limited work has been conducted from this viewpoint in identifying the cognitive (e.g., perceptions of infidelity) and affective factors (e.g., jealousy) that precipitate digital dating abuse (Bhogal et al., 2019). Taken together, the growing evidence in support of perceptual, emotional, and behavioral adaptations can together inform a better understanding of violence in response to real or suspected infidelity.

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VIOLENCE AND HOMICIDE FOLLOWING PARTNER INFIDELITY

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