

Evolutionary Psychological Perspectives on Rape

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Rape is a fact of life across cultures (Broude & Greene, 1978; Rozée, 1993; Sanday, 1981). In American samples, estimates of the prevalence of rape are as high as 13% for women (Kilpatrick, Edmunds, & Seymour, 1992; Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993). Rape is likely more common, however, because rapes often go unreported (Kilpatrick et al., 1992). Although other forms of rape occur (e.g., male–male rape), this chapter focuses on the rape of women by men. Definitions of rape vary. It is typically defined, and will be defined in this chapter, as the use or threat of force to achieve sexual penile-vaginal penetration of a woman without her consent (Kilpatrick et al., 1992; Thornhill & Palmer, 2000).

Rape became a public and academic focus following the publication of Brownmiller's (1975) book, *Against Our Will: Men, Women, and Rape*. Brownmiller argued that rape is “a conscious process of intimidation by which *all men keep all women* in a state of fear” (p. 15, emphasis in original). Since then, feminist theories of rape have dominated the rape research literature. A prominent version of feminist theory contends that rape is the result of social traditions in which men have dominated political, economic, and other sources of power (Ellis, 1989). Feminist theorists inspired by Brownmiller often interpret rape as a method by which men maintain this power and dominance over women. Moreover, feminist theorists have argued explicitly that rape is not about sexual gratification and often seem more focused on making ideological rather than scientific statements about human psychology and behavior (Thornhill & Palmer, 2000).

This chapter reviews the topic of rape from a modern evolutionary psychological perspective (see, e.g., Barkow, Cosmides, & Tooby, 1992; Buss, 2004). Evolutionary psychology is a powerful heuristic tool that can be used to generate new, testable

hypotheses across all domains of psychology. Evolutionary psychology rests on several key premises (Buss, 2004). The first premise states that natural selection is the only known process capable of producing complex functional systems such as the human brain. The complexity of human behavior can only be understood completely by taking into account human evolutionary history and natural selection. Second, behavior depends on *evolved psychological mechanisms*. These are information-processing mechanisms housed in the brain that register and process specific information and generate as output specific behaviors, physiological activity, or input relayed to other psychological mechanisms. Third, evolved psychological mechanisms are functionally specialized to perform a specific task or to solve a specific problem that recurrently affected reproductive success over evolutionary history. This premise is often referred to as *domain specificity*. Finally, the *numerousness* premise states that human brains consist of many specific evolved psychological mechanisms that work together to produce behavior. Together with a number of other theoretical tools and heuristics provided by modern evolutionary theory, these premises are used to generate evolutionary theories of psychology and behavior.

One such heuristic tool that informs evolutionary psychology is parental investment theory (Trivers, 1972). Parental investment theory consists of two important premises. First, in sexually reproducing species, the sex that invests more in offspring (typically the female) will be more discriminating about mating. Second, the sex that invests less in offspring (typically the male) will be more intrasexually competitive for sexual access to the higher-investing sex. These premises have been supported in research with numerous species, including humans. Human females, like the females of most biparental species, invest more in offspring whereas males invest more in mating effort. These sex differences are greatest in short-term mating contexts (Buss, 1994a, 1994b, 2004).

Misconceptions about Evolutionary Psychology

Some scholars believe that evolutionary psychological research is conducted to justify racism, sexism, or other undesirable “-isms.” For example, Tang-Martinez (1997, p. 116) describes a common feminist view that evolutionary psychology is “inherently misogynistic and provides a justification for the oppression of women.” However, the feminists to whom Tang-Martinez refers are committing what is known as the *naturalistic fallacy*: the error of deriving what *ought* to be from what *is*. This error can be demonstrated clearly with an example: No sensible person would argue that a scientist researching the causes of cancer is thereby justifying or promoting cancer. Yet some people continue to argue that investigating rape from an evolutionary perspective justifies or legitimizes rape (e.g., Baron, 1985; Marshall & Barrett, 1990, cited in Thornhill & Palmer, 2000).

Related to the naturalistic fallacy is the false belief of *genetic determinism*—the idea that behavior is unalterable, programmed, or otherwise unchangeable. This

argument has been debunked numerous times. Biologist John Maynard Smith noted that genetic determinism is “an incorrect idea that is largely irrelevant, because it is not held by anyone, or at least not by any competent evolutionary biologist” (1997, p. 524). No evolutionary psychologist would argue that because rape is produced by evolved mechanisms, it cannot be prevented or we should simply accept its occurrence. The goal of evolutionary psychology, like the goal of any science, is to further our understanding of the phenomenon of interest, which in this case is rape. Researching rape from an evolutionary psychological perspective does not justify or promote this heinous act. Whether evolutionary psychological hypotheses about rape are correct, new perspectives often allow researchers to gain new insights into the targeted phenomenon. Gaining a greater understanding about why rape occurs is fundamental to decreasing its occurrence.

Finally, researchers using an evolutionary psychological perspective often frame hypotheses in terms of the costs and benefits to an organism of performing a particular behavior. These costs and benefits refer to the effects on reproductive success over evolutionary time—that is, costs decreased the probability of successful reproduction whereas benefits increased the probability of successful reproduction. These terms are sometimes misconstrued as referring to a more general idea of perceived costs and benefits to the individual or to society. However, these terms carry no moral or ethical meaning and are used only in the context of naturally selected biological functioning.

Comparative Psychology of Sexual Coercion and Rape

Sexual coercion and rape occur in many species. In fact, evolutionary metatheory has been used to generate the hypotheses that sexual coercion and rape occur in species in which males are more aggressive, more eager to mate, more sexually assertive, and less discriminating in choosing a mate (Thornhill & Palmer, 2000). Sexual coercion and rape occur in insects (Dunn, Crean, & Gilburn, 2002; Linder & Rice, 2005; Thornhill, 1980, 1981, 1987; Vahed, 2002), amphibians, reptiles (Olsson, 1995; Reyer, Frei, & Som, 1999; Shine, Langkilde, & Mason, 2003; Sztatecsny, Jehle, Burke, & Hödl, 2006), fish (Magurran, 2001; Plath, Parzefall, & Schlupp, 2003), birds (Gowaty & Buschhaus, 1998; McKinney, Derrickson, & Mineau, 1983; Pizzari & Birkhead, 2000), and primates (Robbins, 1999; Smuts & Smuts, 1993; Wrangham & Peterson, 1996), among other species.

Two species in particular provide clear examples of adaptations in males to sexually coerce and rape females. A large body of evidence demonstrates that male scorpionflies (*Panorpa vulgaris*) have an anatomical feature that is designed to facilitate sexual access to a female in a coercive fashion—that is, rape. They possess a notal organ that is used specifically and exclusively for rape (Thornhill, 1980, 1981, 1987; Thornhill & Sauer, 1991). Scorpionfly males do not always secure copulations through rape. Instead, males display conditional mating strategies. Males that are

able to produce a nuptial gift of food for the female are allowed to mate without coercion. Males that are not able to do so resort to the conditional rape strategy and use of the notal organ (Thornhill, 1980, 1981, 1987; Thornhill & Palmer, 2000). Thus, male scorpionflies exhibit evidence of specific anatomical traits that evolved to facilitate rape. They also exhibit evidence of a conditional strategy of sexual coercion.

Male orangutans (*Pongo pygmaeus*) also deploy conditional strategies of sexual coercion and rape. Orangutans are unique among apes in that they live solitary lives rather than in groups. Females therefore do not have mates or kin that may deter or prevent rape (Wrangham & Peterson, 1996). This fact alone makes rape a more viable strategy for male orangutans. Forced copulations account for up to half of all copulations (Mitani, 1985; Wrangham & Peterson, 1996). These forced copulations seem to be performed primarily by a subset of males. Wrangham and Peterson (1996) reviewed evidence indicating that male orangutans exist as one of two distinct morphs or behavioral types. The large morphs weigh significantly more, move much slower, and are typically able to find females willing to mate. The small morphs are typically unable to find females willing to mate with them. These small morphs are more likely to chase down and rape females. This represents a conditional strategy. If the smaller males are unable to gain sexual access to females through intrasexual competition and by being attractive to females, they may use the conditional strategy of chasing down and raping a female.

Comparative evidence indicates that males of many species have evolved strategies to sexually coerce and rape females. Rape in humans must also reflect adaptations constructed over evolutionary time. Although numerous explanations have been offered to explain rape in humans (e.g., learning or enculturation, mental illness, personality differences, drug and alcohol use, and other factors; Bergen & Bukovec, 2006; Brecklin & Ullman, 2001; Dean & Malamuth, 1997; Lalumière & Quinsey, 1996), these factors alone cannot explain the existence of such seemingly complex behavior. At best, these factors may increase the likelihood of rape, but they cannot explain the complex organized behavior seen in rape. Only two explanations are likely to be true: that rape is the product of specialized psychological adaptation, or that it is a by-product of other adaptations in the male mind (Palmer & Thornhill, 2003a, 2003b; Thornhill & Palmer, 2000). What evidence supports the hypothesis that rape is the result of an adaptation?

Evidence of Human Adaptations for Sexual Coercion and Rape

For rape to be produced by evolved psychological mechanisms, it must have recurrently generated reproductive benefits for ancestral rapists. These benefits must have outweighed the significant costs that men may incur if they attempt or successfully complete a rape. Despite the costs, there is evidence that rape may have increased the number of women with whom ancestral men copulated and, therefore, the reproductive success of rapist males (Gottschall & Gottschall, 2003; Holmes, Resnick,

Kilpatrick, & Best, 1996; Krueger, 1988; Shields & Shields, 1983; Thornhill, 1999; Thornhill & Palmer, 2000).

Men do not exhibit morphological features analogous to the notal clamp of male scorpionflies. Any rape adaptations that men possess are likely to occur in the form of psychological mechanisms. Researchers, particularly Thornhill and Thornhill (1992; see also Thornhill, 1999; Thornhill & Palmer, 2000) have identified several possible rape adaptations. These adaptations are proposed to be universal features of male psychology that are activated under specific circumstances. Empirical support for evolutionary psychological theories of rape has been mixed. For example, the “loser” or mate deprivation model of sexual coercion, in which men with limited or no sexual access to females rape for lack of other options, typically has not been supported (Malamuth, Huppin, & Paul, 2005; but see also later in this chapter).

A hypothesized design feature of rape adaptations involves mechanisms that cause men to evaluate the sexual attractiveness of rape victims differently than that of consensual partners. Specifically, a rapist might be more successful reproductively by maximizing the chance that a one-time forced copulation will result in pregnancy. According to this hypothesis, a would-be rapist may be more likely to target a highly fertile woman than a woman who is less fertile (Thornhill & Palmer, 2000). Human female fertility (current likelihood of conception per copulation) peaks in the early to mid-20s. Therefore, if women in this age range are overrepresented in reports of rape, it is possible that this reflects a male adaptation that leads to raping fertile women more often than nonfertile women. Numerous studies have documented that young women are most often targeted by rapists, and that women of peak fertility are overrepresented in reported and unreported rapes (Chiglieri, 2000; Greenfield, 1997; Kilpatrick et al., 1992; Shields & Shields, 1983; Thornhill & Palmer, 2000; Thornhill & Thornhill, 1983). This evidence does not support exclusively rape-specific adaptation, however, because men exhibit a preference for sexually attractive partners in general, not just in contexts of rape (see, e.g., Buss, 1994a, 1994b, 2004).

We, like others (e.g., Thornhill & Palmer, 2000), propose that rape is a conditional strategy that may potentially be deployed by any man. Shields and Shields (1983) argued that men use a conditional mating strategy consisting of many mating tactics, including rape. At least one-third of men admit they would rape under specific conditions, and many men report coercive sexual fantasies (see Malamuth et al., 2005, for a review). Such evidence suggests that rape adaptations might be universal features of male psychology. Empirical support for evolutionary psychological hypotheses of rape has been mixed. For example, the mate deprivation model of sexual coercion, in which men with limited or no sexual access to females rape for lack of other options, typically has not been supported (Malamuth et al., 2005; but see also later in this chapter). This mixed support may reflect a lack of appreciation that there may be several distinct types of rapists. For example, Mealey (1995) proposed that men with psychopathy represent a genetically distinct morph different from “normal” men without psychopathy. Lalumière, Harris, Quinsey, and Rice (2005) presented in a related argument that a small proportion of antisocial men who are more likely to

rape form a qualitatively distinct portion of the population. Similarly, as a heuristic strategy, we have defined several rapist types. Specifying these types may generate new insights and testable hypotheses. Other researchers have suggested that defining subtypes of rapists can be potentially valuable (Malamuth et al., 2005).

Our view of rape may be a more nuanced view of rape than has previously been explored. We hypothesize that rape may represent a conditional mating strategy, present in all men, that may result from several qualitatively different ancestral contexts combined with individual difference factors among men. Specifically, we propose five types of rapists (or contexts of rape): (1) disadvantaged men who resort to rape, (2) “specialized” rapists who are sexually aroused by violent sex, (3) men who rape opportunistically, (4) high-mating-effort men who are dominant and often psychopathic, and (5) partner-rapists motivated by assessments of increased risk of sperm competition. We next discuss evidence for each of these types of rapists.

The Disadvantaged Male

The first hypothesized rapist type is characterized by men who are motivated to rape if they have no other means of securing copulations. This may be referred to as the *disadvantaged male* hypothesis. This hypothesis has previously been referred to as the *mate deprivation hypothesis* (Lalumière, Chalmers, Quinsey, & Seto, 1996). It is supported by data indicating that rapes are committed disproportionately by men with low socioeconomic status (Kalichman, Williams, Cherry, Belcher, & Nachimson, 1998; Thornhill & Thornhill, 1983). Furthermore, Krill, Lake, and Platek (2006) presented evidence that men convicted of rape display lower facial symmetry, an indicator of poor genetic quality. Facial symmetry is linked positively with physical and psychological health (Shackelford & Larsen, 1997), and men with lower facial symmetry are perceived as less attractive and as less desirable mates (Gangestad, Thornhill, & Yeo, 1994; Gangestad & Thornhill, 1999; Sugiyama, 2005). Deprived of mates by normal means, some men may resort to rape. Identification of such a rapist type, however, would not necessarily imply a conditional strategy for rape. One can imagine that when reproductive opportunities are dismal, some men might be motivated to take more risks in all domains, with one domain being sexual assertiveness, which might lead to rape.

The Specialized Rapist

Another type of rapist may be the *specialized rapist*. Men in this group are distinguished by being sexually aroused by violent sexual stimuli. These men may possess a psychology that produces differences in sexual arousal in response to depictions of rapes versus depictions of consensual sex. Because rape carries high potential costs for the rapist, particularly if caught in the act, rapists with a psychology that motivated quicker arousal and ejaculation during rape might have been more successful than men who did not possess such a psychology (Thornhill & Palmer, 2000).

Support for the existence of this hypothesized group has been generated by investigating whether men are aroused by depictions of rape versus depictions of casual sex. Meta-analyses indicate that convicted rapists demonstrate greater sexual arousal to scenes of sexual coercion involving force than do nonrapists (Hall, Shondrick, & Hirschman, 1993; Lalumière & Quinsey, 1994; Lohr, Adams, & Davis, 1997; Thornhill & Thornhill, 1992).

Specialized rapists also might possess mechanisms that cause them to evaluate the sexual attractiveness of rape victims differently than the sexual attractiveness of consensual partners. According to this hypothesis, a rapist will be more likely to rape a highly fertile woman than a woman who is less fertile (Thornhill & Palmer, 2000). Research has demonstrated support for this hypothesis (see earlier sections for details). However, it is unclear whether this reflects a specialized rape adaptation or a more generalized male mating strategy. Future research might test the hypothesis that men evaluate the sexual attractiveness of rape victims differently from the sexual attractiveness of consensual partners by examining whether men target for rape reproductive-aged women who are in the most fertile phases of their menstrual cycles. Such a finding would provide stronger support for this rapist type.

If a rape is a one-time event, it might make adaptive sense for the rapist to inseminate the woman with an ejaculate that contains a high sperm count or that otherwise increases the chance of successful fertilization. Indeed, Thornhill and Palmer (2000) have hypothesized that some rapists may be capable of producing a high-sperm-count ejaculate that would increase the chance of fertilization. Men seem to be capable of unconsciously adjusting sperm number in ejaculates, such as in response to a greater risk of sperm competition (Baker & Bellis, 1989, 1993), but it is unknown whether rapists adjust sperm numbers during rape. Evidence for this would lend support to the specialized rapist type.

Researchers have argued that premature ejaculation might have been adaptive ancestrally, perhaps by minimizing the chances of predation or detection by jealous mates (Hong, 1984; see also Gallup & Burch, 2004). It also might make adaptive sense for a rapist to ejaculate as soon as possible after achieving copulation. This would reduce the chances of being injured or retaliated against. Therefore, it is possible that selection may have acted to minimize the time it takes for a man to ejaculate during a rape. Research is needed to test this hypothesis. For example, one might compare the average pre-ejaculatory copulation length during rape versus during consensual copulation.

There is indirect evidence corroborating the hypothesis that rapists' ejaculates are more competitive than those of nonrapists. Gottschall and Gottschall (2003) estimated that pregnancy rates resulting from rape were two times that of consensual per-incident rates. That is, approximately 6% of rapes result in pregnancy compared to approximately 3% of consensual copulations. Even after controlling statistically for the age of the woman, the researchers identified a higher conception rate for rapes than for consensual sex. This evidence suggests that there may be something different about rapists' psychology or the competitiveness of their ejaculates. Further

research is needed, however. One promising area of research is the study of semen chemistry. Burch and Gallup (2006) hypothesized that men may have an adaptation that functions to adjust semen chemistry to cause ovulation immediately following a rape. Future research could profitably test this hypothesis, perhaps by comparing chemical constituents of ejaculates produced by men exposed experimentally to a coercive sexual scenario with ejaculates produced by men exposed experimentally to a noncoercive sexual scenario.

Opportunistic Rapists

The third hypothesized rapist type is that of the *opportunistic rapist*. These men generally seek out receptive women, but they might shift to sexual coercion and rape if women are not receptive or if the associated benefits of coercive sex outweigh the costs—for example, if the chances of injury or retaliation by the victim, the victim's family, or society are particularly low. All rapists are predicted to be attuned to a potential victim's vulnerability, but an opportunistic rapist is especially so. The universality of laws and societal norms prohibiting rape (wife rape being a special exception; see further on) indicates an appreciation that men are more likely to rape when the costs are low (Palmer, 1989; Thornhill & Palmer, 2000). The fact that rapes regularly occur during wartime has been presented as evidence of the assessment of victim vulnerability and decreased likelihood of detection (e.g., Gottschall, 2004). Men in war are likely to assume lowered costs of committing rape because punishment or retaliation is less likely.

The evidence for the existence of this type of rapist, however, is minimal. Theft also is common during war, and for the same reason: punishment or retaliation is unlikely. Support for this hypothesized type may be seen in research demonstrating that women with family members, particularly adult male family members, living nearby are much less likely to be physically assaulted by their partner (Figueredo et al., 2001; Kanin, 1957). This suggests that potential rapists are attending to the probability of retaliation by a victim's adult male family members.

High Mating-effort Rapists

A fourth hypothesized type is the *high mating-effort* rapist. High mating-effort rapists, in contrast to other types, such as disadvantaged rapists, appear to be more sexually experienced (Lalumière & Quinsey, 1996). Rapists of this type may be characterized as aggressive, dominant, and having high self-esteem. These men often are the perpetrators of date or acquaintance rape. Research evidence appears to support this rapist type. Such rapists often may be characterized as psychopathic (Lalumière et al., 2005). Lalumière et al. argue that high mating effort is an important facet of psychopathy. They claim that although most men appear to deploy mating strategies according to environmental contexts, psychopathic men deploy a high mating-effort strategy in most contexts, pursuing many partners with little investment and using coercion and rape

when noncoercive tactics fail. There is evidence that psychopathic men display lower fluctuating asymmetry, an index of overall fitness (Lalumière, Harris, & Rice, 2001), further distinguishing this rapist type from others, such as the disadvantaged rapist.

Research evidence corroborates the plausibility of this rapist type. Dean and Malamuth (1997), for example, found that men who scored high on a Sexual Experience measure “were more likely to report sexual coercion if they were also self-centered as opposed to nurturant” (p. 74). Premarital sexual coercion is associated with sexual promiscuity, earlier onset of sexual activity, and greater sexual experience (Christopher, Owens, & Stecker, 1993; Lalumière et al., 2005). Lalumière and Quinsey (1996) found that a strong indicator of past sexual coercion is positive self-perceived mating success and an extensive history of uncommitted sexual relationships. Finally, the risk of date rape is greater when the man initiated the date, spent money on the woman, and provided transportation (Muehlenhard & Linton, 1987). Perceived relative deprivation, in which an individual’s (high) expectations about having sex are not satisfied (Malamuth et al., 2005), also may play a role in the sexually coercive behavior of high mating-effort men. For example, men who report a greater likelihood of committing rape tend to endorse statements expressing an increased perception of mate deprivation but do not report an overall fewer number of sexual opportunities (Glick & Fiske, 1996; Lonsway & Fitzgerald, 1995). More research must be conducted to test this hypothesized rapist type. For example, researchers might test whether men convicted of date rape or sexual assault score higher on measures of psychopathy.

Partner Rapists

A final hypothesized rapist type includes men motivated to rape their partners under conditions of increased sperm competition risk. Sperm competition is the competition that can occur between males for each to have his sperm fertilize a female (Parker, 1970). The outcome of sperm competition is favored toward males who produce greater numbers of sperm (Parker, 1970, 1982; Pound, Shackelford, & Goetz, 2006). Rape in response to risk of sperm competition is most likely to occur when a man learns or suspects that his long-term partner recently has been sexually unfaithful (Thornhill & Thornhill, 1992).

Partner rapes account for a substantial proportion of reported rapes (Bergen, 1996; Kilpatrick et al., 1992; Russell, 1990). Between 10% and 26% of women report experiencing rape in marriage (Finkelhor & Yllo, 1985; Hadi, 2000; Painter & Farrington, 1999; Russell, 1990; Watts, Keough, Ndlovu, & Kwaramba, 1998). Women are particularly likely to be raped by their partner during a breakup instigated by men’s concerns about their partner’s infidelity (Thornhill & Palmer, 2000). Until very recently in Western society, it was not considered a crime if a man forced his wife to have sex with him. The right of men to sexual access to their partner was considered absolute, and only relatively recently in the United States have men been prosecuted for raping their wives (Bergen, 1996; Russell, 1990).

Studying men's psychological reactions to risk of sperm competition is another possible method for testing the hypothesis that men are motivated to rape their partners under conditions of sperm competition. If men exhibit psychological reactions to risk of sperm competition in noncoercive contexts, it is also possible that they do so in coercive or rape contexts. Research evidence indicates that men do display such psychological reactions. For example, men are more aroused by and prefer sexually explicit images that suggest the occurrence of sperm competition than by sexually explicit images that do not suggest the occurrence of sperm competition (Kilgallon & Simmons, 2005; Pound, 2002). Furthermore, men who spend a greater proportion of time apart from their partners since the couple's last copulation (and therefore face a higher risk of sperm competition) report that they find their partner more attractive, are more interested in copulating with their partner, and believe that their partner is more interested in copulating with them (Shackelford, Goetz, McKibbin, & Starratt, 2007; Shackelford et al., 2002). These results are independent of relationship satisfaction, total time since last copulation, and total time spent apart. The psychological mechanisms that lead men to experience greater interest in copulation and to believe their partner is interested in copulation with them also may be part of the suite of mechanisms that lead men to sexually coerce or rape their partners.

Finally, in a direct test of the hypothesis that men may rape their partners under conditions of sperm competition, Goetz and Shackelford (2006) documented in two studies that men's sexually coercive behavior is positively related to their partner's infidelities, that is, to the risk of sperm competition. Men with partners who committed infidelities or who suspected that their partner had committed infidelities (indicating increased risk of sperm competition) were more likely to perform sexually coercive behaviors, including rape. These findings lend support to the hypothesized psychological mechanisms that motivate men to commit partner rape in response to risk of sperm competition.

In summary, it may be useful to characterize rapists as falling into one of several categories or types, specifically (1) disadvantaged men, (2) specialized rapists, (3) opportunistic rapists, (4) high mating-effort men, and (5) partner rapists. Although future research is needed to test the hypothesized types of rapists, prior studies offer some preliminary support for this model. We have identified potential unique ancestral contexts and individual differences that may have selected for conditional rape strategies. But these contexts and individual differences can be overlapping. This is to be expected, however, as we argue that all men may possess adaptations to rape. For example, a high mating-effort context and an opportunity context are not mutually exclusive: a man who devotes much of his time and energy to gaining short-term matings may be even more likely to commit rape when circumstances (such as wartime) allow him to do so at decreased cost (e.g., when there is a low chance of retaliation).

Again, it is important to note that the existence of adaptations to rape does not mean that rape is inevitable or justified. Like any psychological mechanism, rape mechanisms require functioning genetic and environmental components. Rape is

predicted to occur only under specific environmental circumstances that activate men's evolved psychology. Furthermore, because rape behaviors may have a genetic component does not mean that men cannot control their behavior. Just as men thwart their evolved psychology every time they choose less calorically dense food over more calorically dense food (as when one is on a diet), so too can men thwart evolved mechanisms that may lead them to sexually coerce or rape. Only through thorough research and a broad understanding of sexual coercion, including its evolved basis, can we hope to reduce or prevent rape.

Women's Defenses against Rape

Rape is a traumatic event that is likely to have been a recurrent problem for women over evolutionary history. Rape often leads to many negative consequences for women; therefore, women may have evolved psychological mechanisms designed to motivate rape avoidance behaviors. There are several reasons that rape is traumatic for women. These include disrupting a woman's parental care, causing a woman's partner to abandon her, and causing a woman serious physical injury (Thornhill & Palmer, 2000) or death. Women are sometimes killed after being raped (Shackelford, 2002a, 2002b). Aside from death, perhaps the greatest cost to women who are raped is the circumvention of their mate choice (Wilson, Daly, & Scheib, 1997). This is because anything that circumvents women's choice in mating can severely jeopardize their reproductive success (Symons, 1979).

Researchers have speculated that a variety of female traits evolved to reduce the risks of being raped. Smuts (1992) argued that women form alliances with groups of men and other women for protection against would-be rapists. Similarly, Wilson and Mesnick (1997) proposed and found support for the *bodyguard hypothesis*: women's mate preferences for physically and socially dominant men may reflect anti-rape adaptation. Of course, women may form alliances or prefer dominant mates for reasons other than to avoid rape. Alliances offer protection from such dangers as assault or predation, and dominant mates may possess higher-quality genes, for example. Finally, Davis and Gallup (2006) proposed the intriguing possibility that preeclampsia and spontaneous abortion may be adaptations that function to terminate pregnancies not in the woman's best reproductive interests, such as those resulting from rape. Relatively little empirical work has been conducted to identify specific psychological mechanisms that evolved to solve the recurrent problem of rape avoidance.

Thornhill and Thornhill (1990a, 1990b, 1990c, 1991) have demonstrated that the psychological pain that women experience after being raped may be produced by evolved mechanisms designed to focus women's attention on the circumstances of the rape, particularly the social circumstances that resulted in the rape. Thornhill and Thornhill (1990a, 1990b, 1990c, 1991) argue that, like physical pain, psychological pain motivates individuals to attend to the circumstances that led to the pain and to avoid those circumstances in the future. Victims of rape who have more to lose in

terms of future reproductive success will also experience more psychological pain relative to women with less to lose in terms of future reproductive success (Thornhill & Thornhill, 1983, 1990a; Thornhill & Palmer, 2000). For example, women of reproductive age are hypothesized to experience more psychological pain due to the greater risk of conception. Thornhill and Thornhill (1990a) demonstrated support for this hypothesis, documenting that reproductive-aged women are more traumatized by rape than are post-reproductive-aged women or pre-reproductive-aged girls.

The research conducted by Thornhill and Thornhill focuses on the aftereffects of being raped and on the psychological pain that may motivate women to avoid the circumstances leading to the rape. Very little research, however, has been conducted to identify the specific behaviors women may deploy to avoid being raped. Scheppele and Bart (1983) conducted interviews of women who had been raped or who had been attacked and successfully avoided being raped. Some of these women described “rules of rape avoidance” (p. 64) and how they followed them—for example, “I would never be alone on the street” and “I would watch what I wear” (p. 65). These qualitative data provide preliminary evidence for rape avoidance adaptations in women.

Petralia and Gallup (2002) examined whether a woman’s capacity to resist rape varies across the menstrual cycle. Women in the fertile phase of their menstrual cycle showed an increase in handgrip strength, but only when presented with a sexual coercion scenario. Women not in their fertile phase did not show an increase in handgrip strength. Furthermore, women in all other conditions, including women in the fertile phase who were presented with the neutral control scenario, showed a *decrease* in hand strength post-test. This provides evidence for specialized mechanisms designed to motivate women to behave in ways that cause them to be less likely to be raped. Women who experience increased strength during their fertile phase would be better equipped to defend themselves from would-be rapists. The research by Petralia and Gallup (2002) provides evidence consistent with the hypothesis that women have evolved mechanisms that motivate rape avoidance behaviors.

Chavanne and Gallup (1998) investigated the performance of risky behaviors by women in the fertile phase of their menstrual cycles. A sample of women were asked where they were in their menstrual cycles and to indicate whether they had performed a range of behaviors in the past twenty-four hours. Behaviors were ranked by women in a previous study according to how likely they thought performing the behaviors might be to result in a woman being sexually assaulted, with riskier behaviors given higher risk scores. Individuals’ risky behavior was estimated by taking the summed composite score of all performed activities. Women in the fertile phase of their menstrual cycle reported performing fewer behaviors representing a greater risk of being raped. There was no difference in the likelihood of performing low-risk behaviors between women in their fertile phase and women outside their fertile phase. This research has some methodological problems that

prevent firm conclusions, however. First, the researchers used only one method (i.e., the forward-cycle method) to assess women's menstrual status. Also, Chavanne and Gallup do not specify how the inventory of risky behaviors was developed, noting only that a preliminary sample of women rated the riskiness of the behaviors. In addition, the dependent variable may be confounded by diversity of activity. For example, a woman who performed ten non-risky behaviors (each scored as a 1 on the riskiness scale) could receive the same score as a woman who performed two high-risk behaviors (each scored as a 5 on the riskiness scale; see Bröder and Hohmann, 2003, for discussion). Despite these methodological issues, this research documented a significant decrease in performance of risky behaviors by women in the fertile phase of their menstrual cycle. This evidence is consistent with the hypothesized function of rape avoidance mechanisms, particularly when women are fertile.

Chavanne and Gallup's (1998) study was replicated by Bröder and Hohmann (2003) using a within-subjects design. Twenty-six women who did not use oral contraceptives were tested weekly for four successive weeks. The results indicated that women in the fertile phase of their cycle selectively inhibit behaviors that would expose them to a higher risk of being raped while performing *more* non-risky behaviors. These results provide a conceptual replication of the results reported by Chavanne and Gallup. Women perform fewer risky behaviors when they are fertile, while still demonstrating a higher overall activity level (Morris & Udry, 1970) and even while engaging in more consensual sex (Morris & Udry, 1982). This selective behavior indicates that women may have evolved specialized psychological mechanisms designed to motivate behaviors that decrease the risk of being raped. Although this study addressed many of the issues in the Chavanne and Gallup research, there is still no indication of how risky behaviors were identified. This study also used the somewhat problematic forward- and reverse-cycle counting methods for identifying the fertile phase of the menstrual cycle, both of which depend on the potentially unreliable self-reports of participants (Bröder & Hohmann, 2003).

A recent study by Garver-Apgar, Gangestad, and Simpson (2007) tested the hypothesis that women are more attuned to signs of a man's potential sexual coerciveness during the fertile phase and are able to more accurately detect sexually coercive men during the fertile phase. A sample of 169 normally ovulating women watched short segments of videotaped interviews of men. The women were then asked to rate the men on several items that were summed to create an overall coerciveness rating. Average coerciveness ratings for each man were computed. Finally, women's menstrual status was estimated using the reverse-cycle counting method. The results indicated that women in the fertile phase of their menstrual cycle rated the men as more sexually coercive. This suggests that women at greater risk of conception may be more attuned to signs of male sexual coerciveness than women at lesser risk of conception. This may represent an evolved cognitive error management bias (see Haselton, Nettle, & Andrews, 2005, for an overview) toward identifying men as sexually coercive, which might serve to protect women from being raped. This research

provides more evidence that women may have evolved psychological mechanisms that motivate behaviors to guard against men's sexual coercion and rape. We note, however, that the participants viewed videos of strangers. Studies demonstrate that women have a greater fear of stranger rape than of being raped by someone they know (Thornhill & Thornhill, 1990b), which suggests that stranger rape was the greater adaptive problem. This is despite modern patterns of rape, which indicate that women are more likely to be raped by someone they know (Kilpatrick et al., 1992; Resnick et al., 1993). These results may reflect the greater potential costs associated with stranger rape, such as a decreased likelihood of investment by the genetic father of resulting offspring. Would similar results be found by testing women's coerciveness ratings of acquaintances or other familiar men? Future research is needed to explore these effects in greater detail. For example, researchers might ask women to rate the coerciveness of familiar faces of classmates or celebrities.

In summary, limited previous work suggests that women may have evolved psychological mechanisms that motivate them to avoid being raped. These studies have not assessed specific behaviors performed to avoid rape. Rather, the results of these studies suggest that women may have evolved mechanisms that motivate them to assess the risk of sexual coercion, such as the riskiness of walking in a dark parking lot alone and the coerciveness of a particular man.

Conclusion

Evolutionary psychology is a powerful heuristic tool that allows researchers to consider rape in a new light. Researchers have argued that men possess evolved psychological mechanisms that motivate them to rape in specific contexts. Although some accumulating evidence is consistent with this hypothesis, more research must be conducted before we can conclude that men possess specific adaptations for rape. Furthermore, we propose that a more nuanced view of rapists is needed, in which rapists may be characterized as belonging to one of several types distinguished by the contexts in which they are predicted to commit a rape. Researchers also have hypothesized that women have evolved mechanisms that motivate behaviors to avoid being raped. Some evidence supports this hypothesis. Researchers also must continue to investigate women's evolved rape avoidance mechanisms before generating conclusions. Future research should continue to investigate the psychological mechanisms that may motivate men's rape behavior and women's rape avoidance behavior. Only through continued scientific study of the etiology of rape can we hope to prevent it.

ACKNOWLEDGMENT

This chapter was adapted from McKibbin, W. F., Shackelford, T. K., Goetz, A. T., & Starratt, V. G. (2008). Why do men rape? An evolutionary psychological perspective. *Review of General Psychology, 12*, 86–97. The authors thank Joshua Duntley for insightful comments.

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