

# Mate attraction, retention and expulsion

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Sexual selection theory and parental investment theory have guided much of the evolutionary psychological research on human mating. Based on these theories, researchers have predicted and found sex differences in mating preferences and behaviors. Men generally prefer that their long-term partners are youthful and physically attractive. Women generally prefer that their long-term partners have existing resources or clear potential for securing resources and display a willingness to invest those resources in children the relationship might produce. Both men and women, however, desire long-term partners who are kind and intelligent. Once a partner is obtained, men and women act in sex-specific ways to ensure the continuation and exclusivity of the relationship. Men, in particular, engage in behaviors designed to prevent, correct, and anticipate their partner's sexual infidelity. Relationships dissolve for evolutionarily-relevant reasons: infidelity, childlessness, and infertility. The discussion addresses directions for future research.

*Atracción, retención y expulsión de la pareja.* Las teorías de la selección sexual y la inversión parental han guiado la mayor parte de la investigación psicológica evolucionista sobre las pautas de emparejamiento humanas. Sobre la base de dichas teorías, los investigadores han predicho y encontrado diferencias sexuales en las preferencias y las conductas de emparejamiento. Los hombres prefieren generalmente que sus compañeras estables sean jóvenes y físicamente atractivas. Las mujeres generalmente prefieren que sus compañeros estables dispongan de recursos o de una capacidad potencial para obtenerlos y que estén dispuestos a invertir dichos recursos en los niños que la relación pueda generar. Tanto hombres como mujeres desean, sin embargo, que sus compañeros estables sean considerados e inteligentes. Una vez que se ha producido un emparejamiento, hombres y mujeres actúan de forma diferenciada para asegurar la continuidad y la exclusividad de la relación. Los hombres, en concreto, muestran comportamientos diseñados para evitar, corregir y anticipar la infidelidad sexual de sus parejas. Las relaciones de pareja acostumbran a terminar por razones relevantes desde un punto de vista evolucionista: infidelidad, ausencia de descendencia e infertilidad. En la discusión, se apuntan algunas líneas de investigación para el futuro.

The evolutionary psychological literature on human mating has been guided primarily by the application of principles of sexual selection. Sexual selection theory posits that some characteristics became more prevalent due to the advantages they conferred on an ancestral individual's mating success (Andersson, 1994; Darwin, 1871). Sexual selection may occur via *intrasexual competition*, or competition between members of the same sex in which the winners experience greater mating success than the losers (Darwin, 1871). Sexual selection also may occur via *intersexual selection*, or the selection of particular members of the other sex as mating partners. Both mechanisms of sexual selection eventually lead to a change in the frequency of the desired or undesired characteristics (Darwin, 1871). Additional mechanisms of sexual selection have been identified in the past 40 years, including

scrambles, endurance rivalry, sperm competition, and sexual coercion (Andersson, 1994; Smuts & Smuts, 1993; for review, see Murphy, 1998).

Although Darwin (1871) recognized that males often engaged in intrasexual competition and that females often exercised mate choice, Trivers (1972) provided the explanation for this sex difference. Trivers's parental investment theory notes that members of the sex with the greater obligatory parental investment will be more selective about with whom they mate. Because in humans women have greater obligatory parental investment, women are the choosier sex (Buss, 1996). Our ancestors were those women who carefully selected a mate and allocated their limited reproductive resources wisely. Because ancestral women were selective about with whom they mated, our male ancestors were those men who (1) competed successfully with rivals to obtain and maintain access to these choosy women and (2) took advantage of low-risk opportunities for short-term matings (see, e.g., Buss & Schmitt, 1993). With great success, evolutionary psychologists have applied the principles of sexual selection and parental investment theory to the domain of human mating. This article highlights some of the contributions that evolutionary psychologists have made to the human mating literature, focusing

on three areas: mate attraction and selection, mate retention, and mate expulsion.

#### Mate attraction and selection

Over human evolutionary history, men and women often experienced different selection pressures. For example, women experience maternity certainty whereas men experience paternity uncertainty (e.g., Buss & Schmitt, 1993). Because of these different selection pressures, men and women have evolved some different mating strategies and mate preferences (Buss, 2006). In addition to these sex differences, mate preferences also differ depending on the type of relationship desired. For example, because cooperation with a long-term mate is more extensive than with a short-term mate, agreeableness may be a more desired trait for long-term mates than for short-term mates (Botwin, Buss, & Shackelford, 1997). This section addresses short-term mate preferences, long-term mate preferences, and some processes of mate assessment, paying particular attention to sex differences when relevant.

#### *Short-term (extra-pair) mate preferences*

Ancestral men who engaged in short-term matings with women of high reproductive value (expected future reproduction) would occasionally have received fitness benefits from doing so (Buss, 1996). Women who are young and physically attractive tend to be more fertile than older, less attractive women (Buss, 1989). For this reason, men prefer young, attractive women as short-term partners (Buss & Schmidt, 1993; Kurzban & Weeden, 2005; Li & Kenrick, 2006). Men also prefer a variety of other characteristics in women (see Table 1) because of their suspected relationship with a woman's fertility and future reproductive success. Although both men and women prefer an attractive short-term partner, men exhibit a stronger preference for attractive short-term partners than do women (Li & Kenrick, 2006). Men also report wanting to have more sex partners in their lifetime than do women (Buss & Schmitt, 1993).

*Table 1*  
Short-term mate preferences

| Sex of target | Preferred characteristic(s) of target | Reference  |
|---------------|---------------------------------------|--|
| Female        | Young, physically attractive          | Buss & Schmitt, 1993<br>Kurzban & Weeden, 2005<br>Li & Kenrick, 2006                         |
|               | Breast symmetry, buttocks             | Li & Kenrick, 2006   |
|               | Low WHR                               | Marlowe, Apicella, & Reed, 2005<br>Singh & Young, 1995                                       |
|               | Low BMI                               | Cornelissen, Toveé, & Bateson, 2009<br>Kurzban & Weeden, 2005<br>(cf. Lassek & Gaulin, 2008) |
|               | Unmarried, no casual sex partners     | Shackelford et al., 2004   |
| Male          | Physically attractive                 | Li & Kenrick, 2006   |
|               | Unmarried, no casual sex partners     | Shackelford et al., 2004   |
|               | Muscular, masculine                   | Li & Kenrick, 2006   |

When pursuing a short-term mating strategy, men experience fewer risks than women, in part because men cannot become pregnant and are much less likely to be left raising a child as a single parent. Although researchers agree that men pursue sexually receptive, attractive women for short-term mating, several hypotheses have been offered to explain why women sometimes risk single parenthood by pursuing a short-term mating strategy. Greiling and Buss (2000) suggest that women pursue a short-term strategy to acquire physical resources or to replace a current long-term partner. In contrast, other work suggests that women may pursue short-term matings to acquire good genes at the expense of future investment (Gangestad & Thornhill, 1997; Gangestad, Thornhill, & Garver-Apgar, 2005; Gangestad, Garver-Apgar, Simpson, & Cousins, 2007).

The good genes hypothesis for short-term mating predicts that women will be most interested in good genes during the most fertile phases of their ovulatory cycle. Provost, Troje, & Quinsey (2008) demonstrated that women in the fertile phase of their ovulatory cycle and women with an unrestricted sociosexual orientation—who are more likely to engage in sexual encounters with low investment from a potential partner—are more likely to engage in a short-term mating strategy and prefer men with a masculine gait compared to women in the non-fertile phases and women with a restricted sociosexual orientation—who are less likely to engage in sexual encounters with low investment from a partner (see also Little, Jones, Penton-Voak, Burt, & Perrett, 2002). Women who are ovulating also prefer short-term partners who are more creative (Haselton & Miller, 2006) and who display social presence and intrasexual competitiveness (Gangestad, Simpson, Cousins, Garver-Apgar, & Christensen, 2004).

#### *Long-term mate preferences*

Although women are choosier than men when selecting a short-term mate, men and women appear equally choosy when selecting a long-term mate (Li & Kenrick, 2006). Both sexes prioritize kindness and intelligence in potential long-term partners (Buss, 1988; Li, Bailey, Kenrick, & Linsenmeier, 2002). Researchers also have found sex differences in long-term mate preferences: Women prefer men who are high in social status, have expendable resources, and are older and have greater financial capacity, ambition, and industriousness. In contrast, men prefer women who are attractive and young (Buss, 1989; Li et al., 2002). When assessing prospective partners as long-term mates, men and women first determine if the prospective partner has sufficient levels of the characteristics that are most important (e.g., kindness, intelligence, attractiveness, status) before considering less important characteristics such as creativity and sense of humor, which appear to be processed as «luxuries» in a mate (Li et al., 2002).

#### *Homosexual mate preferences*

The mate preferences of homosexual individuals are consistent with those of heterosexual individuals. As such, sex has a greater impact on mate preferences than does sexual orientation (Bailey, Gaulin, Agyei, & Gladue, 1994). Heterosexual and homosexual men value attractiveness and youth more than social status and expendable resources in a partner (Bailey et al., 1994; Gobrogge, Perkins, Baker, Balcer, Breedlove, & Klump, 2007; Kenrick, Keefe, Bryan, Barr, & Brown, 1995). Regardless of relationship

status, heterosexual and homosexual men express a desire for more sexual partners than do women (Schmitt & International Sexuality Description Project, 2003). Although homosexual men prefer masculine men on average, relatively feminine homosexual men express a weaker preference for masculinity (Bailey, Kim, Hills, & Linsenmeier, 1997). Homosexual women prefer partners who are similar in age, like heterosexual women, but also partners who are more youthful, like heterosexual men (Kenrick et al., 1995). Homosexual women prefer women who look feminine, but not necessarily attractive (Bailey et al., 1994, 1997).

#### *Processes of mate assessment and selection*

Mate assessment and selection are more complicated when additional factors, such as media exposure, family pressures, and self-assessments, are considered. The mismatch hypothesis suggests that discrepancies between the current environments and the environments in which adaptations evolved may result in surprising but predictable behavior (Crawford, 1998). Media exposure is an evolutionary novel experience which may impact human psychology in a predictable way. Kenrick and colleagues (Kenrick & Gutierrez, 1980; Kenrick, Gutierrez, & Goldberg, 1989; Kenrick, Neuberg, Zierk, & Krones, 1994) suggest that men and women exposed to unrealistic distributions of highly attractive others, via mass media, for example, may perceive that desirable mates are more accessible than they actually are. When compared with persons who expose themselves infrequently to mass media, men and women who expose themselves frequently to mass media may be less satisfied by their current partners and less willing to engage in relationships with persons they deem to be less desirable (Kenrick & Gutierrez, 1980; Kenrick et al., 1989).

Recent data from hunting and gathering societies suggests that parents may have had more influence over their children's mate choice decisions than had been previously thought (Apostolou, 2007). Data from these societies suggests that our ancestors may have also been influenced by their parents when making mating decisions. Apostolou (2007, 2008) suggests that exposure to potentially conflicting mate preferences of parents and other kin may cause individuals, particularly women, to select mates differently than if individuals only considered their personal mate preferences (Apostolou, 2007, 2008). For example, parents may exert influence over their children to marry partners from particular family backgrounds to strengthen inter-family alliances, a result which is more preferred by and beneficial to the parents than to the children (Apostolou, 2008).

Additionally, an individual's mate value (attractiveness as a prospective mate) affects an individual's mate preferences (e.g., Buss & Shackelford, 2008; Little, Burt, Penton-Voak, & Perrett, 2001; Smith et al., 2009; for review, Penke, Todd, Lenton, & Fasolo, 2007). Mate value may affect mate preferences via evolved mechanisms that calibrate mate preferences according to which characteristics an individual can reasonably expect to obtain in a mate (Buss & Shackelford, 2008). Such mechanisms would prevent individuals from investing wastefully in doomed attempts to obtain a mate who is unlikely to reciprocate interest. For example, women who are rated as highly attractive exhibit stronger preferences than women rated as less attractive for men who are likely to invest highly in them, who are likely to be good parents, good partners, and have good genes (Buss & Shackelford, 2008). Ultimately, however, men and women tend to pair with

others of a similar mate value (Buss, 2003). After expending effort assessing, selecting, and attracting a potential mate, a person must expend effort to retain the partner.

#### Mate retention

Mate retention behaviors are acts performed to ensure the continuance of the relationship and the partner's fidelity. Men and women are hypothesized to expend effort and energy towards mate retention proportional to the potential costs, which take into account the expenditure required, and benefits, which take into account the likely effectiveness of the mate retention behaviors (Buss, 1988; Buss & Shackelford, 1997). Mate retention behaviors are likely to be deployed when the perceived risk of partner infidelity is high. Men allocate more effort to mate retention when they judge their partners to be more likely to engage in extra-pair sex (Goetz et al., 2005; Buss & Shackelford, 1997). Additionally, men allocate more effort to mate retention when they have spent a greater proportion of time apart from their partner since the couple's last copulation, a proxy for the risk of their partner's infidelity (Starratt, Shackelford, Goetz, & McKibbin, 2007). Men also deploy more mate retention behaviors when partnered to a high mate value other, such as an attractive, youthful woman (Buss & Shackelford, 1997).

Recent work has identified two classes of mate retention behaviors: those that inflict costs on the partner and those that bestow benefits on the partner (McKibbin et al., 2007; Miner, Starratt, & Shackelford, 2009). Low mate value men (e.g., men with few economic resources, unattractive men, disagreeable men) perform more cost-inflicting behaviors, for example, wielding partner-directed insults (e.g., telling a partner that everything is their fault or that their breasts are ugly), and fewer benefit-provisioning behaviors than high mate value men (e.g., men with expendable resources, attractive men, kind men), perhaps because low mate value men lack the resources needed to perform sufficient benefit-provisioning behaviors to retain their mates (Miner, Starratt, & Shackelford, 2009).

Women perform mate retention behaviors as frequently as do men; however, there are sex differences in the frequency with which particular behaviors are deployed (Buss, 1988; Shackelford, Goetz, & Buss, 2005). Buss (1988) found that each sex performs mate retention behaviors that advertise the characteristics important to their partner's sex: Men perform more behaviors than women that display resources to their partners, such as giving the partner an expensive gift, while women perform more behaviors that involve enhancing their own appearance for their partner's benefit and threatening infidelity.

In addition to mate retention behaviors, men also perform behaviors designed to prevent, «correct» and anticipate female infidelity (Shackelford, 2003). Following an infidelity, a man may initiate sex with his partner to induce sperm competition in which the sperm from two or more males simultaneously occupy the reproductive tract of a woman and compete to fertilize her egg (e.g., Baker & Bellis, 1995). By ensuring that his sperm are competing to fertilize his partner's egg, a man may decrease his risk of being cuckolded and unwittingly investing in a rival's offspring. Men who spent a greater proportion of time apart from their partners are more interested in copulating with their partners, report that their partners are more attractive and sexually interested in them, and report that other men find their partners more

attractive (Shackelford et al., 2002, 2007). Men also perform more sexually coercive behaviors—verbal and physical behaviors intended to convince a potentially uninterested partner into engaging in sexual behavior—when their partners have been unfaithful or are likely to be unfaithful (Goetz & Shackelford, 2006). Men report a preference for viewing depictions of two men sexually interacting with one woman (the sperm competition scenario) over depictions of two women sexually interacting with one man (Pound, 2002). Providing additional support for the influence of sperm competition on men's sexual behavior, Kilgallon and Simmons (2005) demonstrated that men have a higher percentage of motile sperm in masturbatory ejaculates produced while viewing images of two men and one woman than in masturbatory ejaculates produced while viewing images of three women.

#### Mate expulsion

Although men and women sometimes expend significant effort to retain their mates, the costs of the relationship (Shackelford & Buss, 2000) eventually can outweigh its benefits and bring about relationship termination. In a cross-cultural study, Betzig (1989) found that infidelity is the most common reason cited for marital dissolution. There are sex differences in reasons for dissolving a relationship, however. The reproductive success of ancestral men was affected greatly by the reproductive value of their partner and their partner's fidelity, which may account for why men are more upset by a partner's sexual infidelities than emotional infidelities (e.g., Shackelford, Buss, & Bennett, 2002). In contrast, the reproductive success of ancestral women was affected greatly by the resources their partner shared with them, which may account for why women are more upset by a partner's emotional infidelities than sexual infidelities (e.g., Shackelford, Buss, & Bennett, 2002). In comparison with women, men are less likely to forgive a sexual infidelity than an emotional infidelity and are more likely to end a relationship following a sexual infidelity than following an emotional infidelity (Shackelford, Buss, & Bennett, 2002). Marriages are entered into and dissolved for reproductively relevant reasons, including childlessness and infertility (Betzig, 1989). Childlessness also is a good predictor of remarriage (Buckle, Gallup, & Rodd, 1996). Men likely prefer to marry women without children to avoid devoting resources to stepchildren (Buckle et al., 1996).

Women are able to reproduce for a shorter period of their lives than are men. This might account for the findings of Buckle and colleagues (1996), who demonstrated that women are less willing to stay in a marriage without children than men and more likely than men to divorce a partner early in the relationship. After a divorce, men are more likely to remarry than women and men without children from a previous marriage tend to marry women who had never been married. Men with children from a previous marriage, however, marry women who have been married, perhaps because, as Buckle et al. suggest, men with children are more interested in having a wife who will be a caregiver than a wife who will bear more children. It may also be, however, that men with children have a lower mate value than childless men and therefore must partner with a woman who already has children and is also of lower mate value.

Following the dissolution of a relationship, both parties must find methods to cope with the change. Although both sexes tend to

engage in behaviors such as discussing the situation, women are more likely to engage in behaviors to enhance their appearance such as purchasing new clothes (Perilloux & Buss, 2008). Perilloux and Buss (2008) suggest that after a breakup, women are particularly sensitive to enhancing their appearance before attempting a new romantic relationship because a woman's appearance is central to her mate value.

#### Conclusions and future directions

Evolutionary psychology has contributed to our understanding of human mating behavior, providing explanations for sex-similar and sex-differentiated behaviors. Misconceptions about evolutionary psychology nevertheless persist (e.g., Buller, 2005; Buller, Fodor, & Crume, 2005). The evolved psychological mechanisms discussed herein normally operate unconsciously—that is, outside of the individual's conscious awareness. Although we suggest that men, for example, prefer young, attractive women as short-term mates, we are not suggesting that men are conscious of the evolutionary rationale that caused this preference. Along these lines, readers should be cautious to avoid concluding that the psychologies we have described herein are morally or ethically defensible on the grounds that they have an evolutionary explanation. In contrast with this erroneous conclusion, an evolutionary understanding of human behavior and psychology can aid attempts to eliminate inequality and sexism rather than provide theoretical justification for it.

Men and women value kindness and intelligence in partners (Buss, 1988; Li et al., 2002). In both short-term and long-term relationships, men value physically attractive partners (Buss, 1989; Buss & Schmidt, 1993; Kurzban & Weeden, 2005; Li et al., 2002; Li & Kenrick, 2006). Women value physical traits more in short-term than long-term mates, where financial resources become more relevant (Buss, 1989; Li et al., 2002; Li & Kenrick, 2006).

Once a man or a woman has invested effort in assessing and attracting a mate, they often expend significant time, effort, and resources to keep their mate faithful (e.g., Buss, 1988). Men and women perform diverse mate retention behaviors, which sometimes correspond to advertising the traits desired by their partner's sex. Recent work has addressed the relationship between mate value and mate retention behaviors, demonstrating that low mate value men perform more behaviors that inflict costs on their partners to retain them than high mate value men (Miner, Shackelford, & Starratt, 2009; Miner, Starratt, & Shackelford, 2009). One potential direction for future work may be to examine the dynamic relationships between changes in mate value and changes in the performance of mate retention behaviors. For example, men who experience a sudden loss in financial prospects or expendable resources may alter their performance of mate retention behaviors, shifting from behaviors with a more positive influence on their partner to behaviors likely to inflict costs on their partners.

Despite considerable effort to maintain a relationship, relationships sometimes end. Dissolution is common in childless relationships and those in which an infidelity has occurred (Betzig, 1989; Shackelford, Buss, & Bennett, 2002). Relationship infidelities have also been linked to the proportion of major histocompatibility complex (MHC) alleles shared by a couple which are involved in immune function and may play a role in

mate attractiveness (Garver-Apgar, Gangestad, Thornhill, Miller, & Olp, 2006). If infidelities in relationships are difficult to forgive and sometimes lead to dissolution (Shackelford, Buss et al., 2002), future research might address the long-term consequences of MHC compatibility for relationship satisfaction and dissolution.

For example, couples who share many MHC alleles may be more likely to divorce than couples who share fewer MHC alleles. In conclusion, evolutionary psychology has made and continues to make significant contributions to the mating literature, from partner selection to relationship dissolution.

## References

- Apostolou, M. (2007). Sexual selection under parental choice: The role of parents in the evolution of human mating. *Evolution and Human Behavior*, 28, 403-409.
- Apostolou, M. (2008). Parent-offspring conflict over mating: The case of family background. *Evolutionary Psychology*, 6, 456-468.
- Andersson, M.B. (1994). *Sexual selection*. Princeton, NJ: Princeton University Press.
- Bailey, J.M., Gaulin, S., Agyei, Y., & Gladue, B.A. (1994). Effects of gender and sexual orientation on evolutionarily relevant aspects of human mating psychology. *Journal of Personality and Social Psychology*, 66, 1081-1093.
- Bailey, J.M., Kim, P.Y., Hills, A., & Linsenmeier, J.A.W. (1997). Butch, femme, or straight acting? Partner preferences of gay men and lesbians. *Journal of Personality and Social Psychology*, 73, 960-973.
- Baker, R.R., & Bellis, M.A. (1995). *Human sperm competition*. London: Chapman & Hall.
- Betzig, L. (1989). Causes of conjugal dissolution: A cross-cultural study. *Current Anthropology*, 30, 654-676.
- Botwin, M.D., Buss, D.M., & Shackelford, T.K. (1997). Personality and mate preferences: Five factors in mate selection and marital satisfaction. *Journal of Personality*, 65, 107-136.
- Buckle, L., Gallup, G.G., & Rodd, Z.A. (1996). Marriage as a reproductive contract: Patterns of marriage, divorce and remarriage. *Ethology and Sociobiology*, 17, 363-377.
- Buller, D.J. (2005). Evolutionary psychology: The emperor's new paradigm. *Trends in Cognitive Sciences*, 9, 277-283.
- Buller, D.J., Fodor, J., & Crume, T.L. (2005). The emperor is still underdressed. *Trends in Cognitive Sciences*, 9, 508-510.
- Buss, D.M. (1988). From vigilance to violence: Tactics of mate retention in American undergraduates. *Ethology and Sociobiology*, 9, 291-317.
- Buss, D.M. (1989). Sex differences in human mate preferences: Evolutionary hypotheses tested in 37 cultures. *Behavioral and Brain Sciences*, 12, 1-49.
- Buss, D.M. (1996). Paternity uncertainty and the complex repertoire of human mating strategies. *American Psychologist*, 51(2), 161-162.
- Buss, D.M. (2003). *The evolution of desire* (2nd ed.). New York: Basic Books.
- Buss, D.M. (2006). Strategies of human mating. *Psychological Topics*, 15, 239-260.
- Buss, D.M., & Schmitt, D.P. (1993). Sexual strategies theory: An evolutionary perspective on human mating. *Psychological Review*, 100, 204-232.
- Buss, D.M., & Shackelford, T.K. (1997). From vigilance to violence: Mate retention tactics in married couples. *Journal of Personality and Social Psychology*, 72, 346-361.
- Buss, D.M., & Shackelford, T.K. (2008). Attractive women want it all: Good genes, economic investment, parenting proclivities and emotional commitment. *Evolutionary Psychology*, 6, 134-146.
- Cornelissen, P.L., Toveé, M.J., & Bateson, M. (2009). Patterns of subcutaneous fat deposition and the relationship between body mass index and waist-to-hip ratio: Implications for models of physical attractiveness. *Journal of Theoretical Biology*, 256, 343-350.
- Crawford, C. (1998). Environments and adaptations: Then and now. In C. Crawford & D. Krebs (Eds.): *Handbook of Evolutionary Psychology: Ideas, Issues and Applications* (pp. 275-302). Mahwah, NJ: Lawrence Erlbaum.
- Darwin, C. (1871). *The descent of man and selection in relation to sex*. London: John Murray.
- Gangestad, S.W., Garver-Apgar, C.E., Simpson, J.A., & Cousins, A.J. (2007). Changes in women's mate preferences across the ovulatory cycle. *Journal of Personality and Social Psychology*, 92, 151-163.
- Gangestad, S.W., Simpson, J.A., Cousins, A.J., Garver-Apgar, C.E., & Christensen, P.N. (2004). Women's preferences for male behavioral displays change across the menstrual cycle. *Psychological Science*, 15, 203-207.
- Gangestad, S.W., & Thornhill, R. (1997). The evolutionary psychology of extrapair sex: The role of fluctuating asymmetry. *Evolution and Human Behavior*, 18, 69-88.
- Gangestad, S.W., Thornhill, R., & Garver-Apgar, C.E. (2005). Women's sexual interests across the ovulatory cycle depend on primary developmental instability. *Proceedings of the Royal Society of London B*, 272, 2023-2027.
- Garver-Apgar, C.E., Gangestad, S.W., Thornhill, R., Miller, R.D., & Olp, J.J. (2006). Major histocompatibility complex alleles, sexual responsibility and unfaithfulness in romantic couples. *Psychological Science*, 17, 830-835.
- Gobrogge, K.L., Perkins, P.S., Baker, J.H., Balcer, K.D., Breedlove, S.M., & Klump, K.L. (2007). Homosexual mating preferences from an evolutionary perspective: Sexual selection theory revisited. *Archives of Sexual Behavior*, 36, 717-723.
- Goetz, A.T., & Shackelford, T.K. (2006). Sexual coercion and forced in-pair copulation as sperm competition tactics in humans. *Human Nature*, 17, 265-282.
- Goetz, A.T., Shackelford, T.K., Weekes-Shackelford, V.A., Euler, H.A., Hoier, S., Schmitt, D.P., & LaMunyon, C.W. (2005). Mate retention, semen displacement and human sperm competition: A preliminary investigation of tactics to prevent and correct female infidelity. *Personality and Individual Differences*, 38, 749-763.
- Greiling, H., & Buss, D.M. (2000). Women's sexual strategies: The hidden dimension of extra pair mating. *Personality and Individual Differences*, 28, 929-963.
- Haselton, M.G., & Miller, G.F. (2006). Women's fertility across the cycle increases the short-term attractiveness of creative intelligence. *Human Nature*, 17, 50-73.
- Kenrick, D.T., & Gutierrez, S.E. (1980). Contrast effect and judgments of physical attractiveness. *Journal of Personality and Social Psychology*, 38, 131-140.
- Kenrick, D.T., Gutierrez, S.E., & Goldberg, L.L. (1989). Influence of popular erotica on judgments of strangers and mates. *Journal of Experimental Social Psychology*, 25, 159-167.
- Kenrick, D.T., Keefe, R.C., Bryan, A., Barr, A., & Brown, S. (1995). Age preferences and mate choice among homosexuals and heterosexuals: A case for modular psychological mechanisms. *Journal of Personality and Social Psychology*, 69, 1166-1172.
- Kenrick, D.T., Neuberg, S.L., Zierk, K.L., & Krone, J.M. (1994). Evolution and social cognition: Contrast effects as a function of sex, dominance and physical attractiveness. *Personality and Social Psychology Bulletin*, 20, 210-217.
- Kilgallon, S.J., & Simmons, L.W. (2005). Image content influences men's semen quality. *Biology Letters*, 1, 253-255.
- Kurzban, R., & Weeden, J. (2005). HurryDate: Mate preferences in action. *Evolution and Human Behavior*, 26, 227-244.
- Lassek, W.D., & Gaulin, S.J.C. (2008). Waist-hip ratio and cognitive ability: Is gluteofemoral fat a privileged store of neurodevelopmental resources? *Evolution and Human Behavior*, 29, 26-34.
- Li, N.P., Bailey, J.M., Kenrick, D.T., & Linsenmeier, J.A.W. (2002). The necessities and luxuries of mate preferences: Testing the tradeoffs. *Journal of Personality and Social Psychology*, 82, 947-955.
- Li, N.P., & Kenrick, D.T. (2006). Sex similarities and differences in preferences for short-term mates: What, whether and why. *Journal of Personality and Social Psychology*, 90, 468-489.

- Little, A.C., Burt, D.M., Penton-Voak, I.S., & Perrett, D.I. (2001). Self-perceived attractiveness influences human female preferences for sexual dimorphism and symmetry in male faces. *Proceedings of the Royal Society of London B*, 268, 39-44.
- Little, A.C., Jones, B.C., Penton-Voak, I.S., Burt, D.M., & Perrett, D.I. (2002). Partnership status and the temporal context of relationships influence human female preferences for sexual dimorphism in male face shape. *Proceedings of the Royal Society of London B*, 269, 1095-1100.
- Marlowe, F., Apicella, C., & Reed, D. (2005). Men's preferences for women's profile waist-to-hip ratio in two societies. *Evolution and Human Behavior*, 26, 458-468.
- McKibbin, W.F., Goetz, A.T., Shackelford, T.K., Schipper, L.D., Starratt, V.G., & Stewart-Williams, S. (2007). Why do men insult their intimate partners? *Personality and Individual Differences*, 43, 231-241.
- Miner, E.J., Shackelford, T.K., & Starratt, V.G. (2009). Mate value of romantic partners predicts men's partner-directed verbal insults. *Personality and Individual Differences*, 46, 135-139.
- Miner, E.J., Starratt, V.G., & Shackelford, T.K. (2009). It's not all about her: Men's mate value and mate retention. *Personality and Individual Differences*, 47, 214-218.
- Murphy, C.G. (1998). Interaction-independent sexual selection and the mechanisms of sexual selection. *Evolution*, 52, 8-18.
- Penke, L., Todd, P.M., Lenton, A.P., & Fasolo, B. (2007). How self-assessments can guide human mating decisions. In G. Geher & G.F. Miller (Eds.): *Mating intelligence: New insights into intimate relationships, human sexuality and the mind's reproductive system* (pp. 37-75). Mahwah: Lawrence Erlbaum.
- Perilloux, C., & Buss, D.M. (2008). Breaking up romantic relationships: Costs experienced and coping strategies deployed. *Evolutionary Psychology*, 6, 164-181.
- Pound, N. (2002). Male interest in visual cues of sperm competition risk. *Evolution and Human Behavior*, 23, 443-466.
- Provost, M.P., Troje, N.F., & Quinsey, V.L. (2008). Short-term mating strategies and attraction to masculinity in point-light walkers. *Evolution and Human Behavior*, 29, 65-69.
- Schmitt, D.P., & International Sexuality Description Project (2003). Universal sex differences in the desire for sexual variety: Tests from 52 nations, 6 continents and 13 islands. *Journal of Personality and Social Psychology*, 85, 85-104.
- Shackelford, T.K. (2003). Preventing, correcting and anticipating female infidelity: Three adaptive problems of sperm competition. *Evolution and Cognition*, 9, 90-96.
- Shackelford, T.K., & Buss, D.M. (2000). Marital satisfaction and spousal cost-infliction. *Personality and Individual Differences*, 28, 917-928.
- Shackelford, T.K., Buss, D.M., & Bennett, K. (2002). Forgiveness or breakup: Sex differences in responses to a partner's infidelity. *Cognition and Emotion*, 16, 299-307.
- Shackelford, T.K., Goetz, A.T., & Buss, D.M. (2005). Mate retention in marriage: Further evidence of the reliability of the Mate Retention Inventory. *Personality and Individual Differences*, 39, 415-425.
- Shackelford, T.K., Goetz, A.T., LaMunyon, C.W., Quintus, B.J., & Weekes-Shackelford, V.A. (2004). Sex differences in sexual psychology produce sex-similar preferences for a short-term mate. *Archives of Sexual Behavior*, 33, 405-412.
- Shackelford, T.K., Goetz, A.T., McKibbin, W.F., & Starratt, V.G. (2007). Absence makes the adaptations grow fonder: Proportion of time apart from partner, male sexual psychology, and sperm competition in humans (*Homo sapiens*). *Journal of Comparative Psychology*, 121, 214-220.
- Shackelford, T.K., LeBlanc, G.J., Weekes-Shackelford, V.A., Bleske-Rechek, A.L., Euler, H.A., & Hoier, S. (2002). Psychological adaptation to human sperm competition. *Evolution and Human Behavior*, 23, 123-138.
- Singh, D., & Young, R.K. (1995). Body weight, waist-to-hip ratio, breasts and hips: Role in judgments of female attractiveness and desirability for relationships. *Ethology and Sociobiology*, 16, 483-507.
- Smith, F.G., Jones, B.C., Welling, L.L.W., Little, A.C., Vukovic, J., Main, J.C., & DeBruine, L.M. (2009). Waist-hip ratio predicts women's preferences for masculine male faces, but not perceptions of men's trustworthiness. *Personality and Individual Differences*, 5, 476-480.
- Smuts, B.B., & Smuts, R.W. (1993). Male aggression and sexual coercion of females in nonhuman primates and other mammals: Evidence and theoretical implications. In P.J. Slater, J.S. Rosenblatt, C.T. Snowdon, & M. Milinski (Eds.): *Advances in the study of behavior*, vol. 22. New York: Academic Press.
- Starratt, V.G., Shackelford, T.K., Goetz, A.T., & McKibbin, W.F. (2007). Male mate retention behaviors vary with risk of female infidelity and sperm competition. *Acta Psychologica Sinica*, 39, 523-527.
- Trivers, R.L. (1972). Parental investment and sexual selection. In B. Campbell (Ed.): *Sexual selection and the descent of man: 1871-1971* (pp. 136-179). Chicago: Aldine.