

Women's Intrasexual Competition for Mates

MARYANNE L. FISHER

Introduction

Here then is the puzzle. Competition between females is documented in every well-studied species of primate save one: our own . . . Women are no less competitive than other primates, and the evidence will be forthcoming when we begin to devise methodologies sufficiently ingenious to measure it. Efforts to date have sought to find “lines of authority” and hierarchies comparable to those males form in corporations. No scientist has yet trained a systematic eye on women competing with one another in the spheres that really matter to them. The difficulty is not simply narrowness of vision and the mistaken assumption that female competition will take the same form as competition between males, but also the subtlety of interaction between females . . . How do you attach a number to a calumny? How do you measure the sweetly worded put-down? Until we are able to solve such problems, evidence for this hypothesized competitive component in the nature of women remains anecdotal, intuitively sensed but not confirmed by science.

—Hrdy, 1981/1999, pp. 129–130

This chapter is a reply to Hrdy's (1981/1999) call for researchers to examine women's competition in a sphere that matters to them. I will outline various types of evidence that clearly indicate that women's intrasexual competition can be measured. The above quotation from Hrdy sums up the problems involved in

researching one of the most neglected aspects of evolved human mating psychology: how women compete intrasexually to acquire and retain mates. The quotation also applies equally well to women's intrasexual competition in other domains, such as relational status, social dominance, and obtaining resources for the support of one's children; in other words, areas that matter to women. Indeed, in polygynous societies, co-wives intrasexually compete for food and money, paternal care for their children, and for their children's inheritance (Burbank, 1987), and yet these behaviors have remained understudied. Unlike many of the overt, physical ways that men compete, women's competition is subtler, hidden, and disguised. In this chapter I will review why women's intrasexual competition takes this form and what we know at this point about women's competitive behavior. Although women indubitably compete in many ways, I will focus exclusively on the acquisition and retention of mates, as the majority of recent evolutionary-informed research is in this area.

There has been an increase in the number of papers published on this topic since Hrdy made her call, but still, there is much that needs to be studied. Theorists are drawing attention to the fact that we must dispel the negativity surrounding, or placement of values on, women's competition and instead focus on the evolutionary basis of this activity (Ingo, Mize, & Pratarelli, 2007). Many recent studies have illuminated the various strategies that women use, and how factors such as women's fertility impact on their behavior. However, empirical evidence is particularly lacking, possibly because of the difficulty involved in measuring its occurrence. This lack of attention is highly noticeable when compared to the level of research that is conducted on the topic of female mate choice. Although researchers have devoted substantial time and energy into exploring women's mate preferences, including personality, humor, voice, and height preferences, they have not yet spent a comparable level of effort addressing how women actually obtain the men whom they prefer. This chapter will provide an overview of this neglected topic, and show that studying female mate choice, although important, is only part of women's mating effort.

Why Do Women Compete?

Theoretical Review of Definitions

Darwin's (1871) theory of sexual selection is composed of two similar but distinct processes: intersexual selection and intrasexual selection. *Intersexual selection* is the preferential choice exerted by members of one sex for members of the opposite sex possessing particular traits. *Intrasexual selection* is the selection of characteristics that benefit individuals in the competition between members of the same sex for mating access to members of the opposite sex. In the former, individuals express preferences and actively choose mates, and in the latter, individuals

compete for access to mates. Thus, according to Darwin's view of sexual selection, characteristics evolve that enable individuals to gain advantage over same-sex competitors and consequently obtain successful matings. Moreover, both elements have evolved in unison, such that characteristics most preferred by the opposite sex are those that are of most benefit in intrasexual competition.

Intrasexual competition has evolved as an important behavioral adaptation for attracting mates and for gathering resources necessary for reproduction (Darwin, 1871). Strategies used for intrasexual competition may be overt, such as physically fighting with a known rival, or they may be subtler, such as applying cosmetics to enhance attractiveness, where the rival may or may not be known. At first glance, one might think that cosmetic use is akin to the peacock's train, in that the individual is displaying her attractiveness to woo potential mates, and to signal to rivals whether competition would be potentially productive or not. Like the peacock flaunting its train, women are advertising their attractiveness when they use cosmetics. However, women can consciously apply cosmetics to make themselves look younger, with smoother, glowing skin, large eyes, red lips, and thereby deceive potential mates and rivals into thinking that they are more attractive than they might otherwise be.

But let us step back for a moment and think about competition more broadly, because there are many different ways to conceptualize competition. I propose that competition must be seen as rivalry; when two or more individuals are in pursuit of the same resource and that resource is perceived to be insufficient in quantity, the individuals can be considered as being engaged in a competition. The individuals do not have to be conscious of the rivalry, or be even aware of their competitors, but they must be partaking in an activity that draws them closer to attaining the desired resource (Hrdy, 1999). In terms of our topic, I propose that the scarce resource is "good men," as defined below, and the behaviors include a wide range of activities, including dressing up for a night out on the town, telling a rival that the male is a homosexual when he is not, casually making a negative comment about another woman, and calling the male frequently to ensure he is not with another woman.

Returning to sex differences, the literature clearly shows that women compete, but in a different way than men (for a review and application to workplaces, see Buunk, Goor, & Solano, 2010; Buunk, Pollet, Dijkstra, & Masser, 2011). This conclusion mirrors the findings on sex differences in aggression; both sexes are aggressive but express and demonstrate it differently (e.g., Bettencourt & Kernahan, 1997; Björkqvist, Lagerspetz, & Kaukiainen, 1992; Björkqvist, Österman, & Lagerspetz, 1994; Frodi, Macaulay, & Thome, 1977; Liesen, this volume). In tandem to the issue of how competition is defined is the quandary of measurement. Women's competition is often subtle and, thus, difficult to quantify (e.g., Cashdan, 1999; Hrdy, 1999). Therefore, the techniques used often have to be similarly indirect and innovative, often relying on observations or changes in perception.

The Link Between Competition and Aggression

There exists a link between competition and aggression that underscores much of the research, so in an effort to be transparent in my logic, I present that link here. I consider *aggression* as any form of behavior or action directed at the goal of harming or irritating another person (Barron, 1977; Eron, 1987). One type, *indirect aggression* is when a perpetrator tries to cause harm while simultaneously attempting to make it appear as though there was no harmful intention (Björkqvist, Lagerspetz, & Kaukiainen, 1992). In this way, indirect aggression is akin to *relational aggression* (Crick & Grotpeter, 1995; Henington, Hughes, Cavell, & Thompson, 1998), which is the manipulation of peers via their relations and reputation, and interference with friendships and group inclusion. Often indirect aggression is used within the context of relationships, directed at someone's reputation, or for the purposes of group exclusion, for example. While indirect aggression means that there is an unknown aggressor or that the aggressor can claim that s/he was not performing an act for aggressive purposes, relational aggression can involve direct or indirect tactics with the only criterion being that it happens within the context of a relationship.

For example, indirect aggression among girls and women includes behaviors such as breaking confidences; criticizing others' clothing, appearance, or personality; trying to win others to one's side; shunning; excluding from the group; writing nasty notes; and spreading false stories and gossip (Björkqvist, 1994; Owens, Shute, & Slee, 2000; Simmons, 2002). It often involves the use of social networks, third parties, or other means to inflict harm on another individual (Fry, 1998). This social manipulation is usually performed to obscure any intention to cause harm, thus reducing the possibility of retaliation and counter-aggression (Björkqvist, et al., 1992). Thus, the victim is attacked circuitously so that the attacker can inflict harm without being correctly identified (Björkqvist, 1994; Björkqvist et al., 1992). Furthermore, girls and women tend to perform their aggressive acts from within a tightly woven group of allies, thereby intensifying the damage to the victim (Simmons, 2002), as more aggressors are involved.

Researchers have proposed a link between aggression and competition, such that aggression is necessary for competition to occur (e.g., Schuster, 1983). This theory has wide support in the literature (e.g., Burbank, 1987). Moreover, it seems that indirect aggression is linked to sexual readiness, as earlier onset in sexual behavior has been documented in aggressive girls (White, Gallup, & Gallup, 2010).

Historically, researchers have focused on men's aggression and their competitive nature, often arguing that the two are interlinked (e.g., Daly & Wilson, 1990; Geary, Byrd, Hoard, Vigil, & Numtee, 2003; Marlowe, 2000; Mazur & Booth, 1998; Symons, 1979; Trivers, 1985; Van de Vliert & Janssen, 2002; Wilson & Daly, 1985). Many researchers have noted that men are more physically aggressive than women (e.g., Cashdan, 1998; Fry, 1998; Maccoby & Jacklin, 1974), which has been

used to show that men are competitive and women are not (e.g., Symons, 1979). This conclusion is simply inaccurate. For example, in a cross-cultural examination, Burbank (1987) found that in 61% of the 137 cultures she analyzed, women engaged in physical aggression, typically fighting other women over men, thereby showing that women can be directly aggressive and competitive. Other researchers have argued that the sexes do not differ significantly with respect to the frequency of aggressive behavior in general (e.g., Bettencourt & Miller, 1996; Frodi, Macaulay, & Thome, 1977; Ramirez, Andreu, & Fujihara, 2001). Overall, it seems that researchers have only begun to explore forms of female aggression and have largely neglected female intrasexual competition, especially as it applies to acquiring mates. Indeed, it remains “a vast area of ignorance” (Berglund, Magnhagen, Bisazza, König, & Huntingford, 1993, p.186). So, why is it that women’s intrasexual competition has been overlooked?

Perhaps the answer lies in the fact that women rarely compete in physical ways, as overtly as men. Women, more than men, often compete in ways that do not involve direct physical contact, instead using verbal attacks or indirect social aggression (e.g., Barash, 2006; Campbell, 1999; Valen, 2010). It may be the case that, because women possess less physical strength than men, they develop alternative methods of competing, and thereby have developed unique strategies (Björkqvist, 1994). Campbell (1999; but see Liesen, this volume) suggests that this lack of physical competitiveness reflects not merely an absence of male-type risk-taking, but rather a successful female adaptation that results in reproductive benefit. She argued that when women become mothers, they become the primary caregivers and protectors of their children. Thus, it is more important for the mother to remain alive than the father, leading to the use of indirect, low-risk, strategies to resolve disputes. Taylor et al. (2000) similarly posits that in stressful situations, women do not have a “fight or flight” response. A fight response might cause them to “put themselves and their offspring in jeopardy, and the flight response . . . may be compromised by pregnancy or the need to care for immature offspring” (p. 412; see also Moscovice, this volume). Instead, they propose that women have evolved a “tend or befriend” response to stress, with tending being the quieting and caring for children and blending into the environment, and befriending being the creation of networks of associations containing individuals who will provide resources and protection for the woman and any children.

The Scarcity of Good Men

The advantages, in terms of individual fitness, of finding and then retaining a mate of sufficient quality cannot be overstated. Consequently, most of the theory surrounding female competition for mates is framed with respect to seeking a mate for a long-term relationship (with the duration of the long-term being undefined). The standard argument, then, is that intrasexual competition may be beneficial for gathering resources that are needed for reproduction and childcare. Men who are

good providers and possess the physical ability to serve as protectors (i.e., protect against “infanticide, sexual harassment, theft of valued resources, and general coercion;” Rodseth & Novak, 2006, p. 196) are a resource for which women may intrasexually compete. Women have faced sex-specific reproductive circumstances during evolutionary history; in contrast to men, women have energetically costly gametes that are comparatively few in number. Once fertilization occurs, it involves a substantial investment in terms of energy and time. Due to this differential in required reproductive effort, men’s optimal reproductive strategy may be to seek as many matings as possible and invest little in any resulting children, while women’s optimal strategy may be to carefully seek a mate and invest heavily in any children (as based on mammalian parental investment strategies as elaborated by Trivers, 1985). It is probable that these differences in reproductive strategy have influenced methods of competition. For example, men may compete for access to fertile women, while women may compete for access to men with resources and who are willing to provide paternal care (Buss, 1989; Cashdan, 1998).

What is missing from this standard argument is the acknowledgment that women sometimes seek short-term, primarily sexual relationships (Buss & Schmitt, 1993). When seeking a brief interaction, women are thought to prefer a mate with high “gene quality” given that the man will presumably not invest any resources or parental care in any resulting children (see for example, Gangestad & Simpson, 2000). I propose that women’s competition follows the type of relationship they are seeking; if seeking a brief interaction, women will compete in ways to advertise their physicality, sexuality, and lack of commitment, while if they are seeking a long-term partner, women will compete in ways that advertise their parenting abilities and fidelity. Indeed, this appears to be the case, as Schmitt and Buss (1996) found that women pursuing a short-term relationship emphasized their sexuality and attractiveness, whereas women pursuing a long-term relationship promoted their faithfulness and sexual restrictiveness. Similarly, they found women pursuing a short-term relationship described other women, whom they perceived as potential competitors, as “ugly,” “frigid,” and “unhygienic,” whereas in a long-term scenario they emphasized a competitor’s promiscuity. Although these findings are promising, they are based on self-reported behavioral surveys, and it would be beneficial to have data from other methods for additional support. I should note that another possibility exists; women seeking a short-term relationship simply might not need to compete as much as women seeking a longer relationship. This prediction is based on the findings of Kenrick, Groth, Trost, and Sadalla (1993), who reported that, when considering women for relationships of various durations, men place more importance on female attractiveness as the expected duration increases. In other words, men have lower standards for a woman’s attractiveness (which is an important element of male mate preference) when seeking a mate for a one-night stand, as opposed to steady dating or marriage. Subsequently, perhaps not the *form* but instead the *quantity* of competition changes in parallel to the length of the relationship.

Furthermore, it must be emphasized that competition does not end at mate acquisition; once a good mate has been selected, he must be retained, and the strategies used in the former situation will presumably be distinct from those in the latter. The strategies used may therefore vary depending on relationship status. To acquire a mate, one might advertise her positive qualities, make herself maximally attractive, and try to appear kind, friendly, and helpful. To keep a mate, though, one might claim that a potential rival is cruel, has a sexually transmitted infection, or a poor reputation, all features that are invisible and not readily confirmed (Fisher & Cox, 2011). Moreover, one might actually alter her own views; for example, Johnson and Rusbult (1989) demonstrated that individuals who were highly committed to their relationships actively, and perhaps even consciously, derogated available, attractive opposite-sex individuals on interpersonal dimensions such as intelligence and faithfulness (see also Simpson, Gangestad, & Lerma, 1990; Lydon, Meana, Sepinwall, Richards, & Mayman, 1999; Maner, Rouby, & Gonzaga, 2008; but also Fisher, Tran, & Voracek, 2008). This issue of how one's relationship status (i.e., whether or not one is attached, one's level of commitment) relates to the use of competitive strategy is far from resolved.

What We Know About Women's Intrasexual Competition

Results From Social Psychological Investigations

To begin, it is important to recognize that there are various behavioral strategies individuals use in intrasexual competition for mates. Two that have been documented are self-promotion and competitor derogation. *Self-promotion* is the enhancement of one's positive qualities, relative to those possessed by members of the same sex. In one of the first studies on the topic, Buss (1988) assessed via surveys people's use of self-promotion for the purpose of mate attraction and found women self-promoted by manipulating their appearance and men by displaying and bragging about their resources. Whereas the intention of Buss (1988) was to examine self-promotion for the sole purpose of mate attraction, Walters and Crawford (1994) examined self-promotion for the purpose of intrasexual competition and largely replicated his results. The second strategy, *competitor derogation* is any act used to decrease a rivals' mate value relative to oneself. Using a similar method to Buss (1988), Buss and Dedden (1990) found women tended to derogate rivals' appearance, while men typically derogated rivals' physical abilities and resources.

In a two-part study, Fisher, Cox, and Gordon (2009) examined sex and relationship status differences in selecting self-promotion versus competitor derogation in specific situations. For example, participants chose between "Sometimes when you see the man you're involved with, you say something to him about your own attractiveness, how fit and healthy you are looking" versus "Sometimes when

you see the man you're involved with, you say something to him about your rival's unattractiveness, how unfit and unhealthy she is looking." In the first part, a convenience sample of undergraduate students was provided with forced choice items, which revealed self-promotion was selected significantly more often, regardless of context, sex, or relationship status. In the second part, the researchers asked a sample from the community to complete continuous measures (with the same contextual information as part one). For example, participants were asked, "How often have you tried to improve your appearance (e.g., dieted, dressed well, whitened teeth)?" with a scale ranging from never or very rarely to more than once a day. They found that women, more than men, reported using self-promotion, while men reported higher levels of competitor derogation. Those who were dating and those who were romantically uninvolved used both strategies more than those in common-law or married relationships.

More recently, Fisher and Cox (2011) performed a qualitative study in which participants listed all the ways in which they compete for mating attention, which revealed two additional strategies. One is *mate manipulation*, where one removes the target or goal of the competition so that no competition is necessary, such as by sequestering the mate or displacing his attention from a potential rival. The other was *competitor manipulation*, which is where one attempts to convince a rival that the potential mate is not worth the costs of competition. The methods of persuasion need not be honest, but because the price of deception is frequently high in terms of ostracism or retaliation, individuals utilizing deception must do so with caution (Hess, 2009). The results showed that the majority of listed tactics were those related to self-promotion, followed by mate manipulation, competitor derogation, and competitor manipulation. Women were significantly more likely than men to list self-promoting tactics concerning their general physical appearance and concerning their body and athleticism. Men were significantly more likely to list direct actions, including bullying or intimidating a rival or putting down a rival's material possessions, when derogating a competitor.

Fisher and Cox (2011) then used the qualitative data to create a survey to assess how frequently people performed these behaviors. They found self-promotion to be the most-used strategy, followed by mate manipulation, while competitor manipulation and competitor derogation were used an equivalent amount. In light of this finding and the data from Fisher, Cox, and Gordon (2009), in which social desirability influenced the use of competitor derogation, they proposed that self-promotion improves one's presentation to a mate, while other strategies may lead to negative evaluations (Fisher & Cox, 2009, for a review). Self-promotion can be disguised as self-improvement, which is socially desirable. Moreover, it does not necessitate knowing the identity of one's rivals, and it can be used to attract a large number of mates rather than to identify a specific mate. Interestingly, Fisher and Cox (2011) did not find any sex difference in strategy use, but did confirm that those in romantic relationships competitor derogate more than those who are romantically uninvolved. Regarding the lack of a sex difference in comparison

to previous work by others, perhaps by keeping the survey items intentionally broad, they captured more behaviors. Walters and Crawford (1994) reported that several tactics had to be omitted from their analysis because judges were required to agree that the tactic was competitive and also agree on the tactic's purpose. That is, "if one sex makes more use of subtle competitive tactics, the method used in this study may not detect ... such tactics" (p. 12). This exclusion is important in light of the large body of research that reveals women's use of indirect, subtle forms of competition (Björkqvist, Österman, & Lagerspetz, 1994).

Fisher, Shaw, Worth, Smith, and Reeve (2010) then sought to explore the possibility that those who use competitor derogation would be negatively evaluated by potential mates, which would partly explain the greater reliance on self-promotion. To do so, they conducted a study with a pre-post design. In the first part, men rated photographs of women in terms of how friendly, kind, physically attractive, promiscuous, and trustworthy they thought the woman was, her overall desirability as a mate, her potential to make a fit parent, and how much they would consider her for a long-term relationship or for a brief sexual relationship. In the second part of the study, the stimuli were constructed so that it appeared that one woman had made a negative statement (i.e., derogation) about another woman; both women's photographs were included, and fake names were assigned. A new group of participants then rated the derogator on the dimensions, allowing for a comparison. Overall, men significantly decreased their evaluations of the derogator's friendliness, kindness, trustworthiness, and overall desirability as a mate. A comparison group of female participants were also included; instead of rating how much they would consider the model for a relationship, they indicated whether they believed they could improve the model's appearance by giving her a makeover, which may indirectly suggest whether women believed the model was "trying her hardest" to look attractive. Women's results mirrored those of men, but women also significantly decreased their views of the derogator's fitness as a parent and her physical attractiveness. The study design incorporated the idea that the type of derogation might matter, and thus included derogations that were based on either sexuality, appearance, or personality. These more in-depth results of how derogators are viewed by men are presented in Table 1.1, while Table 1.2 shows the results for the comparison group of women. Surprisingly, derogators are not rated negatively with regard to how likely men are to consider them for a long-term relationship or sexual relationship, nor in terms of their promiscuity or physical appearance. Concerning this last characteristic, previously we found men's views of women's physical attractiveness remains quite stable, regardless of gaining information about a woman's sexual history or expected duration of any future romantic relationships, while women's views are influenced by this type of information in potential mates (Williams, Fisher, & Cox, 2008).

Using a different approach, DeBacker, Nelissen and Fisher (2007) studied the role of gossip in rivalry for mates. One form of gossip, "sexual rivals reputation gossip," is information about the mating skills of competitors, which helps

Table 1.1 Negative changes in men’s views of various dimensions of female derogators according to the type of derogation; “X” indicates significant decrease, see Fisher et al. (2010)

	<i>Appearance Derogation</i>	<i>Sexuality Derogation</i>	<i>Personality Derogation</i>
Friendliness	X		X
Kind	X	X	X
Physically attractive			
Parenting ability			X
Promiscuity			
Trustworthiness	X	X	
Consider for long-term relationship			
Consider for sexual relationship			
Overall desirability	X	X	X

Table 1.2 Negative changes in women’s views of various dimensions of female derogators according to the type of derogation; “X” indicates significant decrease, see Fisher et al. (2010)

	<i>Appearance Derogation</i>	<i>Sexuality Derogation</i>	<i>Personality Derogation</i>
Friendliness	X	X	X
Kind	X	X	X
Physically attractive	X	X	X
Parenting ability	X	X	X
Promiscuity	X		
Trustworthiness	X	X	X
Could be improved with a makeover			
Overall desirability	X	X	X

to identify rivals and allow individuals to more readily select a winning strategy. Individuals could also manipulate the information to alter rivals’ reputations, such as by exaggerating or supplying additional details. Hess (2009) viewed this as “informational warfare” and proposed that gossip is a strategy for within-group competition and for attacking and defending reputations; it may be more useful in women’s intrasexual competition than in men’s intrasexual competition, which would increase selection for psychological adaptations for informational aggression in women (Hess, 2009). Using a recall study of vignettes manipulated for content, DeBacker et al. (2007) found sex differences in the ability to remember

information about rivals. They predicted women would recall more same-sex information than men, because gossip may be a useful tool in future derogation of rivals (Buss & Dedden 1990; Schmitt & Buss 1996), particularly for women who rely on indirect aggression (Hess, 2009). As predicted, Debacker et al. found women recalled more information about the mating skills of female characters than men recalled about the mating skills of male characters. Moreover, female characters' physical attractiveness was recalled more by both sexes than that of male characters, and male characters' wealth was recalled more by both sexes than that of female characters. These findings suggest that both men and women attend to the attractiveness of women, either to determine their potential mate value (in the case of men) or to assess them as threats for intrasexual competition (in the case of women). Similarly, both men and women attend to the wealth of men for the same reasons.

Attending to the features of rivals is a critical facet of intrasexual competition. It is logical that knowing about the local mating market, particularly about one's rivals, can influence one's own behavior. Hill and Durante (2011) found that priming women with images of attractive local women representing potential competitors caused them to self-report a stronger desire to engage in attractiveness-enhancing but also risky behaviors such as tanning and using diet pills. Interestingly, women in romantic relationships seemed particularly interested in taking diet pills, which indicates that competitive behavior remains when mated. The proposition is reasonable, given one's mate could be poached or commit infidelity.

Although it would presumably be advantageous to be able to accurately assess the mate quality of one's rival in the immediate environment, Hill (2007) proposed that people have a tendency to overestimate how much members of the opposite sex find those of the same sex attractive as potential mates, which she termed, "the mate competition overestimation bias." She argues that while it would be ideal to be able to perfectly estimate the mate value of rivals, the temporal shifts of mate preferences as well as individual differences, and people's tendency to hide or deceive their true preferences, makes it unlikely that the related evaluation of rivals can be accurate. She further posits that the harm of underestimating the value of a rival is worse than overestimation, and showed that indeed, both women and men are prone to the latter.

Cross-Cultural and Developmental Findings

Intrasexual competition among girls and women is prevalent across cultures. The most convincing evidence is from Burbank's (1987) cross-cultural investigation of 317 societies that revealed women are the most common target of female aggression. She discovered that cross-culturally, women are physically aggressive, destroy property, refuse to perform duties, and insult others nonverbally (e.g., through gestures, locking someone out of a domicile). These findings must

be considered with some caution, though, because it is very likely that women spend the majority of their time in the presence of other women, and because Burbank excluded measures of indirect aggression.

Other studies provide further cross-cultural evidence for intrasexual competition for mates, albeit through documenting indirect aggression. In most of these studies, the authors note that sexual jealousy was a strong motivation for aggressive acts. In Argentina, Hines and Fry (1994) found women use more indirect aggression (e.g., gossiping, lying, ridiculing, invidious comparisons of clothing and attractiveness) than men, and that men use more physical aggression. Olson (1994) obtained similar results in her examination of Tongan women. An account of a holiday in Greece by Kostash (1987) demonstrated indirect aggression via exclusion and "cold stares." Even the small island society of Vanatinai, New Guinea, provided support for the idea that women frequently use indirect aggression (Lepowsky, 1994). In addition to these studies, to date, female indirect aggression has also been documented in Australia (Owens, Shute, & Slee, 2000); Finland, Israel, Italy, and Poland (Österman, et al., 1998); and the United Kingdom (Campbell, 1995).

One investigation clearly showed women's aggression is linked to reproduction via mate attainment. In her 1983 study of Zambian society, Schuster documented that women were faced with a scarcity of desirable (e.g., reliable and resourceful) men due to pronounced social and economic stratification based on an economy of surplus rather than subsistence. Over time, women grew increasingly dependent on men for resources, and men became increasingly unreliable as providers, resulting in a scarcity of highly desirable men. Promiscuity became more prevalent, and thus marital relationships were considered to be unstable, such that a man was often a potential target of sexual advances from other women. Women, especially co-wives, competed by gossiping, quarrelling, and often by physical fighting.

Some of these studies found gossip to play an important role in women's competition (e.g., Schuster, 1983). One use of gossip is to alter reputations. Although not framed as such, Rucas and colleagues' (2006) study of the Tsimane women in Bolivia specifically focused on the manipulation of other women's reputation. Evaluations of women's attractiveness were found to be altered according to reputational information concerning trustworthiness, social intelligence, wealth, status, mothering ability, and housekeeping ability, but there was no effect based on manipulations of promiscuity. Thus, they showed that gossip may be effectively used to alter evaluations of mating rivals.

In a study framed as an inquiry into the adaptive function of menopause, evidence of competition in Gambia has also been documented. Mace and Alvergne (2011) recently presented preliminary findings that in rural Gambian households competition exists among women living in the same compound of a reproductive age. They found several instances of mothers who became grandmothers before reaching menopause, and that for these individuals, having a grandchild significantly reduced their reproductive rate. They argue that menopause thus evolved

as a way to reduce intrasexual competition for mates. As an aside, there is likely more evidence of women's intrasexual competition from anthropological studies than has been documented; researchers probably notice women's intrasexual competition for mates but do not focus on it, as it is not the central topic of their study. Hopefully at some point, someone will collect these observations into a coherent document to show the universality of this behavior, and how it can be influenced by context, such as the presence of young children, number and age of co-wives, and resource scarcity.

As for developmental evidence, it seems that for girls, increases in indirect aggression align with reproductive onset. Björkqvist et al. (1992) found dramatic increases in indirect aggression among girls who were approximately 11 years of age, followed by still higher rates among 15-year-olds; meanwhile, boys' rates remain stable. Indeed, Österman and colleagues (1998) reported that girls, aged 8, 11, and 15, in Finland, Israel, Italy, and Poland, primarily rely on indirect aggression (and boys on physical or verbal aggression). In terms of adult populations, this sex difference remains, such that women often use indirect aggression, especially in social relationships, whereas men have a decreased use of physical aggression and increased use of verbal aggression.

Studies on relational aggression also support the prediction that intrasexual competition increases at reproductive onset. With a sample of approximately 900 second and third grade children, Henington and associates (1998) found boys received higher peer ratings of relational aggression than girls. However, among children in grades three through six, Crick and Grotpeter (1995) reported that girls scored higher on relational aggression than boys. Together, these results suggest female aggression changes in response to reproductive development. This possibility remains to be tested, though, because the difference might stem from contrasting definitions and measures.

Results From Biological Investigations

For brevity, I have excluded comparative investigations into female intrasexual competition, although there have been important strides made, especially in the nonhuman primate literature. Similarly, I omit anthropological discussions about the influence of hunting and gathering on the development of female peer relationships, and how these activities may have affected the evolution of female intrasexual competition, as compared to other apes (see Rodeth & Novak, 2006, for a review).

One of my first investigations into women's intrasexual competition involved ratings of female (and for comparison, male) facial attractiveness, according to ovulatory cycle phase (Fisher, 2004). I argued that decreases in attractiveness ratings were akin to competitor derogation, whereby one is devaluing a rival, and later proposed that the purpose of this behavior might be to inadvertently persuade a potential mate that a rival is not attractive (see Fisher & Cox, 2009).

The results showed that ovulating women had significantly lower evaluations of female faces as compared to non-ovulating women. Interestingly, there was no difference for male faces. I posited that these findings indicated women derogated competitors at a time most critical for conception. In a follow-up study, Lucas, Koff, and Skeath (2007) documented women in the highly fertile part of their cycle were less likely to share monetary rewards in a game, and more likely to reject a chance to share in a monetary stake when it was a low offer. They propose that their finding shows that women in the most fertile part of their cycle may be prone to competing for resources.

Further, evidence of endocrinological influence on women's intrasexual competition was indirectly obtained by Welling et al. (2011), who found that mate retention tactics are higher among women using hormonal contraceptives (especially for synthetic estradiol) than nonusers, especially tactics related toward their mates. Men whose mates were users also reported an have increased rates of mate retention tactics, but directed them toward rivals and mates. Both forms of mate retention are likely competitive behaviors, in that one is manipulating a mate by ensuring that he does not attend to potential rivals (see Fisher & Cox, 2011).

There is a sizable body of literature addressing how women behave according to their ovulatory cycle hormones. In general, it seems that some women modify their behaviors during times of high fertility to appear maximally enticing to potential mates. For example, women may dress more fashionably and select more revealing clothing when in a phase of high fertility (Haselton et al., 2007; see also Durante, Li, & Haselton, 2008, for a review of cues to ovulation). Durante et al. (2008) propose that women might be dressing sexier as a way of outcompeting other women on the mating market during a time when it matters most in terms of probability of conception. Moreover, they found that for those involved in a romantic relationship, satisfaction mattered; women who were satisfied with their mate shifted their preferences toward revealing clothes when maximally fertile. Durante et al. (2011) then went one step further and showed, using shopping behavior at a retail clothing website, that ovulating women chose sexier and more revealing attire (including shoes and accessories). This effect was particularly salient when women were first primed to notice attractive local women (i.e., mating rivals), as opposed to unattractive women, and attractive or unattractive men.

Recently, Markey and Markey (2011) suggested that although men attend to women's physical attractiveness, it is not the only characteristic that is evaluated, and hence, not the only one that might be susceptible to hormonal shifts. They found that men are most attracted to women with a warm interpersonal manner; that is, men like women who act kind, accommodating, sympathetic, and gentle. Interestingly, they demonstrated that women who are in the highly fertile part of their cycle exhibited more of these warm characteristics and less dominance, as compared to other parts of their cycle.

What We Still Need to Investigate

Friend or Rival?

There are many options for future research, based on the findings reviewed in this chapter.

I have investigated the topic of women's intrasexual competition for mates for over a decade, and one question in particular has constantly troubled me: How do women know when someone is an ally, someone that they should befriend (à la Taylor et al. 2000) versus someone who is a rival? Women's alliances are extremely important, especially given that they serve the adaptive purpose of providing allomothering (Hrdy, 2009). At the same time, women absolutely must compete for mates and to retain mates. How is this path between friend and rival navigated? Is there an empirical design that can explore the decision-making process that would capture the nuances of such a delicate balance between friend and foe? I hope so, but it remains to be performed. Likewise, I propose that group dynamics, composition, and demographics influence the use of competitive strategies. For example, women may only compete with other women who are not in their immediate social group, and the derogation of rivals may be an effective way of maintaining social bonds. This possibility is supported by research on the use of gossip as an important mechanism for the maintenance of women's friendships (e.g., Dunbar, 1996).

The nonhuman primate literature clearly indicates that human females are distinct. Rodseth and Novak (2006) discuss this uniqueness as follows. Although there is noteworthy variation among populations, female chimpanzees have a relatively solitary existence with few social alliances, partly due to natal dispersion to reduce feeding competition. This aversion to competition prevents them from forming bonds with female kin. However, women, even when they move into a group of unrelated individuals in a highly patriarchal society form close and lasting friendships. They propose that these friendships represent alliances "for the purposes of competition against others" (p. 203). Does this model fit when talking about mate acquisition and retention? That is, do models of social bonds such as this one capture the nuances of women's intrasexual competition for mates? If so, how women select their alliances needs to be explored, considering these friends also represent rivals for mates.

Akin to deciding whether someone is a friend or rival is the decision of strategy use. Many factors likely impact on this decision-making process, including the quality of the mate, identity of the rival, or past experience with a particular tactic. An obvious example concerns attractiveness; women's attractiveness is an important component of men's mate preference (Buss, 1989) and consequently a vehicle of women's competition (e.g., Fisher, 2004). Therefore, perhaps women evaluate their own attractiveness with respect to other women to determine the type of strategy they should use. Research has shown that a woman who is unattractive

is relatively ineffective in derogating the appearance of a rival, as compared to an attractive woman (Fisher & Cox, 2009). As a result, she should rely on alternative tactics. Although this decision seems straightforward, it is confounded by the fact that evaluations of the physical attractiveness of one's rivals are rarely accurate, as people tend to overestimate rivals' attractiveness (Hill, 2007). Therefore, if a woman's decisions regarding strategy are based only on physical attractiveness, there is a reasonable chance for failure. Instead, her decision should include multiple sources of information, such as the relationship one has with rivals, the number of rivals, their personality features, whether the rivals are romantically involved, and the riskiness of the tactic.

The Influence of Mate Value

Another issue that needs to be more adequately explored is how to measure the frequency and effectiveness of self-promotion tactics in daily life. Ways to capture competitor derogation are relatively easier; one can note decreases in attractiveness ratings (e.g., Fisher, 2004), or listen to what is overheard in women's washrooms (Blennerhassett & Fisher, 2011). Documenting and measuring self-promotion is much trickier, though, as these behaviors can be disguised as self-improvement mediated by social norms, or simply as dimensions of one's personality (e.g., "I'm not *acting* nice, I *am* nice"). Casual observation leads me to predict one could examine primping behavior at a dance club, or how women interact with each other when in the presence of desirable men, but extending these findings to study typical daily life seems problematic given that self-promotion can be so readily disguised as self-improvement, for example.

In a similar vein, researchers still have not discovered the role of self-perceived and other-perceived mate value in women's intrasexual competition. We know that people who engage in social comparison tend to adjust their competitive strategy. For example, Buunk and Fisher (2009) found that women who engaged in social comparison self-reported that they engaged in intrasexual competition. Likewise, Buss et al. (2000) found women experienced distress when they believed potential rivals had more attractive faces and bodies, and proposed that jealousy might be a way to examine this phenomenon. That is, jealousy might be an emotional reaction to the self-comparison against rivals. Maner et al. (2009) found that once primed about concerns of infidelity, those with high chronic jealousy attend vigilantly to the attractiveness of potential rivals, remember those individuals, and think of them negatively, as compared to those with lower jealousy.

Recently, Arnocky and colleagues (2011) documented that women in romantic relationships who made frequent social comparisons in terms of attractiveness also were most likely to engage in indirect aggression. They argue that these are women who might perceive themselves to have low mate value in terms of physical attractiveness, and thus, will perceive more threats to existing relationships. This perception leads them to try to control their partner and also ensure that

rivals are kept at arms' length. As Arnocky et al. (2011) review, behaving indirectly aggressively toward rivals may be useful in that it can reduce the social standing of the target, such as by spreading a false rumor, and "because of the negative symptoms associated with indirect victimization, such as depression or social anxiety" (p. 11), and increase one's own standing via popularity.

Indeed, it seems that having an awareness of one's attractiveness (and hence, at least a partial assessment of self mate-value) influences competitive behaviors. Durante et al. (2008) showed that women with lower self-perceived attractiveness showed larger shifts toward preferring revealing clothes when most fertile, while Bleske-Rechek and Lighthall (2010) found that within pairs of female friends, the woman who was lower in physical attractiveness perceived higher mating rivalry than the friend who was more attractive. These results build on Bleske and Shackelford (2001), who investigated intrasexual competition among same-sex friends in terms of mating rivalry. They hypothesized that people are very selective about their friends because friends are often in close proximity to one's mate. Moreover, they predicted that people take into consideration features such as a friend's promiscuity and physical attractiveness, as these may increase the chances that the friend will successfully poach their mate. Bleske and Shackelford's findings supported this claim; women, more than men, became distressed when female friends enhanced their attractiveness and were sexually available.

Perceptions of potential rivals' attractiveness has also been investigated via uncontrolled muscle contractions. Hazlett and Hoehn-Saric (2000) investigated women's physiological responses to potential rivals using facial electromyographic techniques, and found highly attractive rivals elicited a greater corrugator (brow lowering) muscle reaction and greater self-reported arousal than less attractive women. The authors concluded that attractiveness is particularly salient for women's assessments of other women, and this muscle reaction is due to a defensive display in response to a perceived threat. However, Hazlett and Hoehn-Saric were only able to measure facial muscle movements in response to two categories (attractive or unattractive) of facial stimuli, and thus, it remains for future researchers to continue with this potentially fruitful line of investigation.

Fisher et al. (2008) have also made initial inroads into this area, beginning with the development of a comprehensive self-perceived mate value inventory, and the next step is to investigate how it relates to competitive strategy use. A potentially more interesting question, though, is how one's mate value relates to the mate value of potential competitors; presumably, people compete only with those they perceive as having a similar value. Competing with someone possessing a much higher mate value would be a waste of energy, time, and resources, whereas one would likely win with little effort against someone with a much lower mate value. Competition should therefore maximally exist among those of similar mate values. Although much of the past research reviewed in this chapter logically leads to this prediction, until we can accurately determine the composition of women's mate value and measure the various parts, it remains an unaddressed issue.

Other Avenues for Future Research

There are numerous other lines of investigation to be pursued. Although I have focused on competition solely for the purposes of mating, it remains to be experimentally shown that intrasexual competition, as conceptualized in this chapter, is performed in reference to mating behavior and not other factors. For example, women may derogate other women as a way of maintaining friendships, and the competition might be used for the purposes of sharing information, deepening trust, and excluding others. A longitudinal or cross-sectional life history study could directly test whether female intrasexual competition is solely performed for mating purposes. Young, adolescent women could be observed during prepuberty and postpuberty intervals, and if competition for mates significantly increases in conjunction with reproductive onset, the conclusion would be that competition is performed, at least partly, for reproductive reasons. Similarly, participants could be older women, tested prior to and after menopause. If competition noticeably decreases with the cessation of reproductive capacity, then it would be possible to conclude, to some extent, that competitive behavior is performed for the purposes of mating. Studies of relational and indirect aggression suggest this result will be obtained, but it remains to be tested for competition.

A different potential line of research to explore is the influence of economic independence on women's competition for mates. As reviewed, the literature suggests that women who are seeking a long-term relationship benefit from selecting a mate with resources. What happens, though, if the woman has her own resources; does her wealth influence her mate preferences, and in turn, her strategies or frequency of competition? Likewise, does the number of potential mates influence competition? Presumably in situations of scarcity, competition would increase. However, Cantu and colleagues (2011) reported the results of a preliminary study in which they found women who were primed (via a story or arrays of photographs) to believe that there was a shortage of available men expressed a desire for a high-paying career and to delay starting a family. This finding suggests that at least some women remove themselves from the mating market temporarily, and thus do not engage in competition.

Furthermore, future research is necessary to determine the characteristics in potential mates that elicit female intrasexual competition. Do women compete more strongly for men with resources in comparison to attractive men? What are the traits or characteristics of potential mates that are most preferred, and hence, the features for which women compete? Evolutionary psychologists (e.g., Buss, 1989) have suggested that women most prefer men who demonstrate resources, and value the personality characteristics that result in financial security such as ambition. In contrast, social psychologists (e.g., Hatfield, Aronson, Abrahams, & Rottman, 1966) have suggested that the sexes do not significantly differ in the importance they place on attractiveness in potential mates. The characteristics of potential mates that elicit women's competition need to be identified.

Another line of future inquiry may address how people intrasexually compete in relation to same-sex family members. Kin selection theory suggests that individuals with overlapping genes may assist each other in realizing their reproductive potentials (Hamilton, 1964). Therefore, future research could examine how genetically related sisters versus genetically unrelated sisters respond to potential threats via intrasexual competition. For example, do genetically related sisters discuss each other's attractiveness in a positive way more often than genetically unrelated sisters? Do genetically related sisters attempt to deflect gossip about each other, and defend each other's reputations more so than genetically unrelated sisters? By extension, do genetically related sisters assist each other in acquiring a desirable mate more than genetically unrelated sisters, and if so, how do they use intrasexual competition? Recently, Nitsch and Lummaa (2011) reported preliminary findings based on a preindustrial Finnish dataset of 20,000 individuals. They found that women's (and men's) reproductive success was encumbered by having elder siblings of the same sex, and concluded that once individuals reach sexual maturity, they compete with same-sex siblings for mating opportunities, among other resources. There remains much to be explored in this area.

Female intrasexual competition may also be evident among various professions. For example, due to the intense selection criteria based on attractiveness, professional fashion models would be a potentially viable population to study. Fashion models depend, at least mostly, on their appearance to retain their jobs. For example, Wilson and Edwards (2000) document that female fashion models must be a minimum of 5'8" in height, have clear and flawless skin, healthy hair, long legs, wide-set eyes, high facial symmetry, and typically must be under 22 years of age. Moreover, employers have specific requirements on hip, bust, waist, and thigh measurements, and employers weigh and measure the models weekly (Wilson & Edwards, 2000). Due to this intense pressure to retain a particular appearance, it is possible that models may exhibit higher than usual levels of intrasexual competition specifically in terms of attractiveness. Beauty-show contestants would also be a potential sample of interest for the same reasons. I must note this approach conflates career success with mating success, given that one must be maximally attractive to be well employed, and thus broadens intrasexual competition to include rivalry that is not strictly limited to the mating arena.

One final area that I will mention concerns the interpersonal dynamics underlying strategy use. Cox and Fisher (2008) proposed a rudimentary framework for intrasexual competition that outlined the fact that these behaviors involve an actor (person performing the behavior), the target (e.g., the mate), and the rival. They presented how nine different relationships occur, and how they relate to strategy use. The key is to identify for whom a competitive act is intended, and the consequence of that act. Little attention has been paid to the dynamics of those involved, particularly with respect to whom the behavior is intended to influence.

Conclusion

Women's intrasexual competition for the acquisition and retention of mates exists. The literature on indirect aggression and relational aggression was used to show that intrasexual competition is documented cross-culturally, and seems to be related to the age of reproductive onset, suggesting deep evolutionary roots that underpin women's mating strategies. I then reviewed some of the ways women's intrasexual competition has been explored to date. Women engage in competition using a variety of strategies; they may derogate the attractiveness of a competitor, choose to self-promote, or attempt to manipulate the availability or value of the male who is the target of the competition. I also reviewed the influence of women's fertility on some of their behaviors, such as competitor derogation. Finally, I reviewed several promising lines of research that remain to be pursued. Many exciting, unanswered questions remain, and the research described here is hopefully just the beginning of a long journey of exploration.

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