

Aggress to Impress: Hostility as an Evolved Context-Dependent Strategy

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Given the high costs of aggression, why have people evolved to act aggressively? Comparative biologists have frequently observed links between aggression, status, and mating in nonhuman animals. In this series of experiments, the authors examined the effects of status, competition, and mating motives on men's and women's aggression. For men, status motives increased direct aggression (face-to-face confrontation). Men's aggression was also boosted by mating motives, but only when observers were other men. For women, both status and mating motives increased indirect aggression (e.g., socially excluding the perpetrator). Although neither status nor mating motives increased women's direct aggression, women did become more directly aggressive when motivated to compete for scarce resources. These context- and sex-specific effects on human aggression contribute to a broader understanding of the functional nature of aggressive behavior.

Keywords: sexual selection, aggression, status competition, sex differences, mating strategies

Two guys walk into a bar. The first, professional basketball player Charles Barkley, orders a drink. The second, a local man named Jorge Lugo, tosses some water at Barkley without provocation. Barkley can respond in one of two ways: Ignore the insult or retaliate. Ignoring the insult is the safe and seemingly rational choice; after all, water dries quickly, and Barkley will probably never see Lugo again. Retaliating is more knuckleheaded and has high costs: Not only can it lead to a lawsuit or prison, but Lugo might have a weapon or some friends ready to retaliate. Despite the high potential costs, Barkley spends little time making his decision: He swiftly hurls Lugo through a plate-glass window ("Barkley arrested after bar," 1997).

Law-enforcement officials attribute a high percentage of violent crimes to what they call "trivial altercations" (Wolfgang, 1958). Barkley and Lugo's fight, which started over a spilled glass of

water, would be classified as such an altercation. After examining a large number of such crimes, Wilson and Daly (1985) suggested that these altercations may not be so trivial after all but might, instead, be linked to critically important evolutionary motives related to status and mating. In the current series of studies, we examine how experimentally induced status and mating motives might influence men's and women's aggression.

Although at first glance, aggression might not appear to be linked to reproduction, the current research builds on previous work suggesting that mating goals may underlie many behaviors, including aggression, creativity, and altruism (e.g., Daly & Wilson, 1988; Griskevicius, Cialdini, & Kenrick, 2006; Griskevicius et al., 2007). Indeed, from an evolutionary perspective, human aggression is presumed not only to be highly sensitive to social context but also to serve multiple goals shaped by natural and sexual selection (Archer, 2001; Buss & Duntley, 2006; Campbell, 2005).

Evolution, Context, and Aggression

From one perspective, fighting could be viewed as purely maladaptive: Not only does it seem unlikely to increase the aggressor's popularity but it can also elicit potentially deadly counter-aggression. Yet findings across multiple disciplines indicate that aggression has a deep evolutionary history. Paleontologists have unearthed dozens of prehistoric human remains that contain cranial

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and rib fractures showing the hallmarks of stabbing weapons (e.g., Trinkaus, 1982; Zollikofer, Ponce de León, Vandermeersch, & Lévêque, 2002). A variety of modern-day traditional societies also have a high prevalence of aggression and violence (Chagnon, 1988; Robarchek & Robarchek, 1992). For example, whereas the !Kung San of the Kalahari Desert were once thought to be idyllic "harmless people," they actually have homicide rates four times greater than the United States (Lee, 1979). Because of its cross-cultural and historical prevalence, researchers from a number of theoretical perspectives have suggested that aggression may have had functional benefits to offset its costs (Berkowitz, 1993; Buss & Duntley, 2006).

Humans have clearly not evolved to blindly aggress. Because aggression always bears the risk of retaliation that could lead to injury or death, any organism that behaved aggressively in a persistent and inflexible way would not survive for long. Instead, aggression is a tactic that may enhance or decrease the likelihood of survival or reproduction, depending on the particular context (Archer, 2001; Buss, 2005; Campbell, 2005; Hawley, 1999). An evolutionary perspective suggests several possible ways in which aggression might function to enhance fitness (Buss & Shackelford, 1997). In many animals, aggression may have evolved as a means to defend oneself and one's relatives against attack (Archer, 1988). Using aggression for defense may not only enhance the likelihood of survival directly but can also contribute to building a reputation for toughness, which may deter would-be aggressors. Aggression may have also functioned in part as a strategy to coopt others' resources (Tooby & Cosmides, 1988; Buss & Duntley, 2006). To the extent that aggressive tactics resulted in acquiring important resources, such as land, food, and tools, they could have enhanced the likelihood of survival in certain contexts.

Aggression and Sexual Selection

Although physical aggression can enhance survival, individuals sometimes aggress even when there are no apparent survival benefits. Picking a fight with someone who has merely mouthed an insult, for example, seems likely to reduce, rather than enhance, survival. Yet these kinds of seemingly minor altercations evoke more aggression and homicide than any other motive (Wilson & Daly, 1985). Closer inspection of such altercations suggests that they follow a predictable pattern (Felson, 1982) and appear to be linked to the ultimate evolutionary goal of protecting and enhancing one's status. The relationship between status and aggression is well documented: From the Masai of Eastern Africa to Southerners in the United States, many societies proffer great respect on individuals who fight for their honor (D. Cohen, Nisbett, Bowdle, & Schwarz, 1996). Conversely, from the island of Truk to Spain, many societies disdain and ridicule individuals who do not defend their honor (McCarthy, 1994).

The association between aggression and status provides an important clue for a potential function of aggression not related to survival: By enhancing status, aggression can indirectly augment an individual's ability to attract a mate (and thereby reproduce). Indeed, men who have higher status are more attractive to potential mates across cultures (Betzig, 1986; Buss, 1989). Thus, the link between aggression, status, and mating suggests that aggression may have evolved not only via natural selection but also via sexual selection (Daly & Wilson, 1983; Pellegrini & Archer, 2005).

Whereas natural selection favors traits that enhance the ability to survive, accrue resources, or care for offspring, sexual selection favors traits that enhance an individual's ability to attract mates. As in the case of aggression, traits can evolve through sexual selection, even when those traits actually diminish one's chances of surviving, so long as the mating-related fitness benefits exceed the costs (Darwin, 1871/1981; Kokko, Brooks, Jennions, & Morley, 2003).

Inter- and Intrasexual Selection

Biologists distinguish between two sexual selection processes: intersexual selection and intrasexual selection (Andersson, 1994). Intersexual selection occurs when individuals of one sex prefer to mate with opposite-sex individuals who possess specific traits. This process leads to the evolution of traits such as the peacock's tail, which has specifically evolved to be displayed to peahens in courtship (Petrie, Halliday, & Sanders, 1991). When humans are motivated to attract romantic partners, they also engage in displays linked to intersexual selection. Activating courtship motives, for example, has been found to lead people to display resources through conspicuous consumption, to engage in public displays of altruism, creativity, and anticonformity to group opinion (Griskevicius, Cialdini, & Kenrick, 2006; Griskevicius, Goldstein, Mortensen, Cialdini, & Kenrick, 2006; Griskevicius et al., 2007).

In contrast with intersexual selection, intrasexual selection occurs when members of one sex compete among themselves to attain relative status. Such same-sex competition has been linked to the evolution of traits such as the giant antlers of red deer, which are used primarily to compete with same-sex individuals in establishing a status hierarchy. Intrasexual selection has also been linked to the murderous violence that male chimpanzees exhibit toward males in neighboring troops (Wrangham & Peterson, 1996); by killing their same-sex rivals, chimpanzees effectively remove rivals from the mating pool and enhance their own odds of reproducing.¹

Although researchers have begun to examine how intersexual choice (e.g., courtship) might be linked to various behavioral strategies in humans (e.g., Griskevicius, Cialdini, & Kenrick, 2006; Griskevicius et al., 2007), almost no work thus far has examined how intrasexual competition motives might influence behaviors such as aggression. There are at least two ways in which courtship and competition motives might influence aggression. On the one hand, because both intersexual courtship and intrasexual competition motives are clearly linked to reproduction, activating either motive might trigger a similar response (e.g., a boost in aggression). On the other hand, because competition and courtship may involve distinct strategies, each motive might trigger different behavioral tendencies. For instance, a motive to compete for status might increase aggression, but a courtship motive might not. In addition, the effects of competition or courtship motives on aggression may be different for men and women, as we discuss below.

¹ Although biologists distinguish between inter- and intrasexual selection, it is sometimes difficult to disentangle these processes. For instance, it is often unclear whether a given sexually selected trait functions only to facilitate courtship or only to facilitate competition (Gould & Gould, 1989; Wilson, Daly, & Pound, 2002). Nevertheless, in some species, the traits that females prefer during courtship are different from those that are most useful for male same-sex competition (e.g., Moore & Moore, 1999; Norry, Calcagno, Vera, Manso, & Vilaridi, 1999).

Differential Parental Investment and Aggression

Physical aggression is associated with different costs and benefits for men and women, which have been examined in light of the theories of sexual selection and differential parental investment (Archer & Côté, 2005; Campbell, 2002; Daly & Wilson, 1988; Trivers, 1972). Parental investment refers to the time and energy a parent invests to enhance the viability of a particular offspring at the cost of producing other offspring. Among mammals, females generally contribute more heavily than do males to investment (e.g., women must minimally gestate for 9 months and nurse, whereas men can minimally contribute only a little time and sperm; Trivers, 1972). This sex difference in minimum obligatory parental investment leads females to be choosier than males when selecting a mate. In turn, to attract choosier females, males are more competitive (e.g., Geary, 1998; Van Vugt, De Cremer, & Janssen, 2007).

If females choose males partly on the basis of traits useful for intrasexual competition (such as dominance and aggression), then males who exhibit those traits will be more successful in attracting mates. Indeed, men in many cultures use aggression to ascend a status hierarchy, and in turn, higher status men receive more attention and are more desirable as mates (Li & Kenrick, 2006; Maner, DeWall, & Gailliot, 2008; Mealey, 1985; Turke & Betzig, 1985). Dominance and aggression in women, on the other hand, are not clearly linked to reproductive success (Campbell, 1999; Kenrick, Neuberg, Zierk, & Krones, 1994; Ellis, 1995; Sadalla, Kenrick, & Vershure, 1987). From the perspective of sexual selection theory, women generally do not enhance their ability to attract a mate through aggressive means, at least not to the same extent as men (Campbell, 2002).

Men and women may also have different costs for aggression. Although both sexes can incur bodily harm from same-sex aggression, such harm for a woman may be costlier than for a man: Because women are the primary caretakers for offspring, they are more critical to offspring survival (Campbell, 1999; Taylor et al., 2000). For instance, whereas the lack of an investing father moderately decreases the likelihood of an offspring's survival, the lack of a mother nearly eliminates a child's probability of reaching adulthood in traditional societies (Hill & Hurtado, 1996; Voland, 1988). The costs of aggression for men are different from those for women in another way: Because status for men is linked to reproductive success, it can be costly for men *not* to engage in competitive behavior (Daly & Wilson, 1988). That is, because low-status men are in danger of not having any offspring, aggression can serve as a high-risk strategy to compete for status and ultimately enhance a man's chances of producing at least one offspring. Consistent with this logic, not only are men much more likely than women to engage in violence, especially if the men have relatively low status and have yet to find a mate, but the victims of such violence are overwhelmingly other men (Kenrick & Sheets, 1993; Wilson & Daly, 1985).

Although the theory of differential parental investment explains many sex differences across species, there is an important qualification regarding human parental investment. While mammalian males consistently have lower obligatory parental investment than do females, this sex difference can be less pronounced in humans. Unlike most mammalian males, men tend to invest significantly in offspring (Geary, 2000). In species with significant male invest-

ment, this increased investment is accompanied by an increase in female competition for mates. In the red-necked phalarope (a type of sandpiper), for example, males contribute more parental investment than do females. In line with differential parental investment theory, phalarope males are highly selective about mates, and phalarope females are more competitive with other females (Reynolds, Colwell, & Cooke, 1986). Because human males likewise provide significant parental investment (although usually less than females), men are also more selective about mates than are most other mammalian males (Kenrick, Sadalla, Groth, & Trost, 1990). In turn, this increase in male selectiveness puts pressure on women to compete for mates (Campbell, 2002).

Direct and Indirect Aggression

Although men are more likely than women to engage in aggression, this pertains only to *direct* aggression—face-to-face confrontation intended to hurt another. But consistent with human parental investment, competition for status and mates can lead women to engage in a less costly form of aggression: *indirect* aggression—behavior intended to hurt someone without face-to-face confrontation (Archer, 2004; Bjorkqvist, Lagerspetz, & Kaukiainen, 1992).² Whereas direct aggression is a high-cost and low-benefit strategy for women (Campbell, 1999; Taylor et al., 2000), indirect aggression offers a lower-cost strategy for intrasexual competition by decreasing the risk of physical injury while retaining many benefits (Bjorkqvist, 1994; Buss & Schmitt, 1996).

Much research shows that girls use more indirect aggression than boys. Although this sex difference diminishes in adulthood (Archer, 2004), it does not disappear completely. For instance, when men and women are exposed to the same aggression-evoking stimulus, women have a stronger desire than men to retaliate via indirect aggression (Hess & Hagen, 2006). In contrast, although adult men tend to engage in both types of aggression, men have a greater tendency than women to aggress directly (e.g., violent fist fights; Daly & Wilson, 1988). Thus, whereas men appear to be more likely to compete with same-sex rivals with direct aggression, women appear to be more likely to use indirect aggression. Building on these general findings, the current research set out to investigate how motives related to inter- and intrasexual selection might produce context-specific effects on men's and women's direct and indirect aggression.

Research Overview

To examine the context-specific links between status competition, mating, and intrasexual aggression, we conducted two self-report studies of aggression in naturalistic settings (Pilot Studies 1 and 2), followed by a series of laboratory experiments (Experiments 1–3). The two pilot studies were designed to investigate (a) the extent to which people report that status concerns motivated their past aggressive acts in naturalistic settings and (b) how men and women had actually responded to naturally arising aggression-

² Indirect aggression includes rumor spreading, gossiping, ostracism, and punitive friendship termination. Although such tactics are sometimes called relational or social aggression, these labels refer to the same fundamental set of phenomena we refer to as indirect aggression (see Archer & Coyne, 2005).

provoking situations. After establishing a link between status and aggression responses in naturalistic settings, we report the results of three experiments in which we explicitly activate motives to compete for status, compete for scarce resources, or attract a mate. Across these experiments, we examine the effects of such motivations on men's and women's inclinations to aggress in direct and indirect ways.

Pilot Study 1: Status and Recalled Aggression

In the first pilot study, we asked 153 college students (89 men, 64 women; M age = 19.7 years, $SD = 1.4$) to recall the last time they engaged in an act of same-sex *direct aggression* ("confrontational fight or argument with another person of the same sex as you") and the last time they engaged in an act of same-sex *indirect aggression* ("non-confrontational—not face-to-face—fight or argument with another person of the same sex as you"). Participants then indicated the primary reason for why they engaged in each type of aggressive act by choosing a response from one of several options (*self-defense*, *status/reputation*, *showing off*, *related to romantic interest*, *other*).³ Participants were also asked to recall the total number of times they had engaged in directly and indirectly aggressive acts in their lifetimes.

Results showed that 48.3% of men and 45.3% of women indicated status/reputation concerns as the underlying reason for their last act of direct aggression. For their last act of indirect aggression, 31.5% of men and 34.4% of women indicated status/reputation concerns as the underlying reason. Thus, a considerable portion of both men and women indicated that their last act of direct and indirect aggression was primarily motivated by status concerns.

Although men and women did not differ significantly in the extent to which status motivated their aggression, men and women differed considerably in the total number of times they had engaged in each type of aggression (see Figure 1A). As expected, there was an interaction between type of aggression and sex, $F(1, 151) = 5.08$, $p = .026$. Men, on average, had engaged in direct aggression almost four times as frequently as women (male $M = 20.7$, $SD = 56.67$; female $M = 5.9$, $SD = 9.6$). Conversely, women reported engaging in indirect aggression relatively more frequently than men (male $M = 18.1$, $SD = 27.0$; female $M = 22.9$, $SD = 39.5$). Overall, the pilot study showed that status-related competition appeared to be an important motive for aggression for both men and women. And consistent with previous research, men reported engaging in more direct aggression, whereas women reported engaging in more indirect aggression.

Pilot Study 2: Behavior in Aggression-Provoking Situations

The second pilot study investigated how men and women naturally responded the last time they were in an aggression-provoking situation. We asked 156 college students (93 men, 63 women) to consider a situation in which a same-sex person is publicly rude to them: "You're at a party and a man/woman you know from one of your classes carelessly spills a drink on you and does not apologize." We asked a yes/no question about whether something like this had ever happened to them. If they had been in such a situation, we asked them how they responded the last time

this happened. Participants chose responses from the following options: *walked away*, *engaged in direct aggression* (e.g., *shoved or yelled at the person*), *engaged in indirect aggression* (e.g., *later told someone else negative things about the perpetrator*), or *did something else*.

Results showed that 76.3% of men and 76.2% of women indicated that something like this had happened to them, suggesting that participants in our sample were familiar with this kind of situation. When reporting how they responded the last time they were in this kind of situation, results indicated, as in the first pilot study, a sex difference in type of aggression in the predicted direction (see Figure 1B). Specifically, men were most likely to have engaged in direct aggression (43.0%), followed by walking away (39.8%), indirect aggression (9.7%), and doing something else (7.5%). In contrast, women were most likely to walk away (34.9%), followed by indirect aggression (29%), direct aggression (25%), and doing something else (11.1%). Thus, when finding themselves in an actual aggression-provoking situation (of the sort we use in our experimental manipulations), a sizable portion of men and women reported engaging in direct and indirect aggression, respectively.

Experiment 1: Competition, Courtship, and Aggression

Considering that both men and women report status as a large motivator of their past aggression, and considering that men report actually engaging mostly in direct aggression and women report engaging mostly in indirect aggression, we conducted an experiment in which we manipulated people's motives and measured their aggressive tendencies. Specifically, the first experiment examined whether activating intrasexual competition motives or activating intersexual courtship motives would influence men's and women's aggressive tendencies, compared with individuals in a control condition.

On the basis of the context-specific costs and benefits of aggression for men and women, we made several specific and competing predictions for how competition and courtship motives might influence aggression. For men, we predicted that a motive to compete for status would increase *direct* aggression (compared with control). However, there were several different possibilities for how men's aggression could be influenced by a courtship motive: On the one hand, because inter- and intrasexual selection might be inextricably linked, a courtship motive might have the same effect as competition and increase aggression; on the other hand, courtship and competition motives might be expected to have distinct functional effects on direct aggression. For instance, whereas competition motives might enhance aggression, courtship motives might not.

For women, we predicted that a motive to compete for status would increase *indirect* aggression (compared with control). Analogous to the predictions for men, there were several possibilities of

³ When selecting the primary reason for their aggression, participants were provided with examples for each option: For *status/reputation*, "I was insulted; I was defending honor." For *showing off*, "I did it because I could; I was having fun or looking for trouble." For *related to romantic interest*, "I was trying to impress a person I like; another person was hitting on someone I like." And for *self-defense*, "I was physically attacked without provocation."

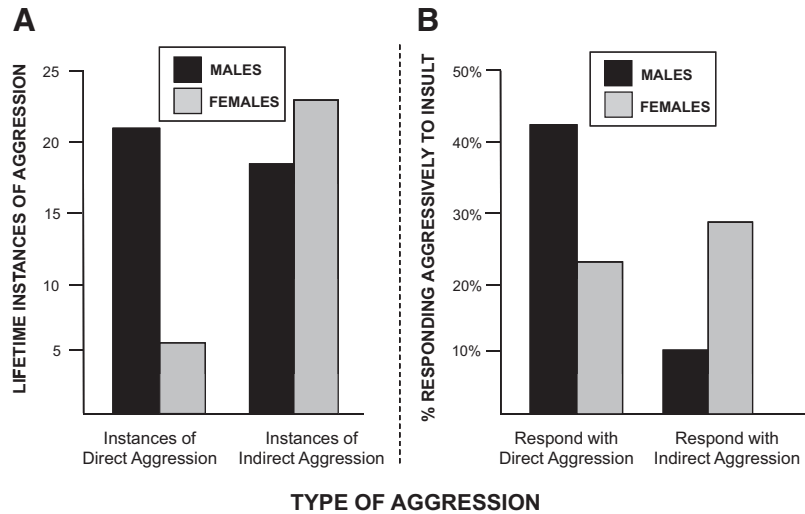


Figure 1. Number of recalled instances of aggressive behaviors and percentage of people who have responded aggressively to an insult (Pilot Studies 1 and 2).

how women’s aggression might be influenced by a courtship motive: On the one hand, a courtship motive might have the same effect as competition and increase indirect aggression; on the other hand, a courtship motive might not influence women’s aggression.

Method

Participants. One hundred seventy-eight participants (94 men and 84 women) from a large state university were recruited for the study as partial fulfillment of their class requirement. All participants came to the lab in groups of 2 to 8, and each was seated between partitions at a computer.

Design and procedure. The design of the experiment was a 2 (Participant Sex) × 3 (Motive: competition vs. courtship vs. control) × 2 (Aggression Type: direct vs. indirect) mixed-factorial design. Participant sex and motive were between-participants factors; aggression type was a within-participant factor. At the beginning of the study, participants read a scenario intended to activate either a competition, courtship, or neutral (i.e., control) motivational state. Participants then indicated how they would respond in a situation in which they were publicly insulted (the same situation that was used in Pilot Study 2).

To minimize potential suspicions, we used a cover story. Participants were told that they were going to participate in several different studies and that the first study is about memory. Participants then read a short story and were told that they would be asked to recall information about the story later in the session. However, because it was important to let some time pass before the memory-recall task (ostensibly, to allow for memory decay), participants would work on another study. Post-study interviews during pilot testing did not reveal suspiciousness.

Motive inductions. At the beginning of the study, participants read a short story to activate a competition motive, a courtship motive, or serve as a control. Each story was about 700 words long and had the same instructions: “Please carefully read the following story. As you read, try to imagine yourself in the scenario and try to feel the emotions and feelings that the person is experiencing.”

In the *competition* story, participants imagined having recently graduated from college and coming to their first day of work at a high-status job. Impressed by the many prestigious features of the new work environment, they soon learn that they will be in competition with two other (same-sex) individuals. Specifically, the boss informs them that whereas one of the three will be fired, one of them will not only be promoted to a luxurious corner office but will also get a large bonus and be put on the fast track to the top. The story ends by encouraging participants to imagine their feelings of enthusiasm and motivation to get the high-status promotion. (It is important to note, as detailed in Table 1, that the competition story was specifically designed *not* to elicit much anger, frustration, or other types of negative arousal associated with aggression.)

In the *courtship* story, participants imagined meeting a highly desirable person of the opposite sex. After a slightly awkward initial interaction, the two people end up spending a wonderful day together, including having a romantic dinner and meaningful conversation. The story ends with participants imagining being highly excited after their romantic date and feeling strongly motivated to

Table 1
Feelings and Motives Elicited by Each Motive-Induction Prime

	Motive condition					
	Control		Competition		Courtship	
Elicited feeling	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Desire to compete	2.61	1.46	6.32	1.54	3.33	2.26
Desire for status	1.95	0.69	6.42	1.57	4.20	2.21
Desire to attract mate	1.43	0.82	2.05	1.66	7.00	1.65
Positive arousal	3.32	0.97	5.63	2.11	5.65	1.45
Negative arousal	3.45	1.11	2.42	2.03	1.70	1.11

Note. Means are on a 1–9 scale, whereby higher numbers indicate a more intense state.

pursue this person. This story was similar to ones used in other research that activates courtship motives (e.g., Griskevicius et al., in press, 2007), and the story primarily served to induce romantic arousal for both men and women.

The *control* story followed a similar trajectory as the other two stories and was designed to elicit some arousal. However, the control story did not involve other same-sex or opposite-sex individuals, and it did not relate to competition or courtship. Specifically, participants imagined being at home by themselves and realizing that their wallet is missing. They search for the wallet throughout the house, and the story ends as the person stumbles upon the wallet.

To examine whether the stories elicited the intended feelings and motives, we asked a separate group of 61 participants (40 men and 21 women) to read one of the three stories with the same instructions. Then, they indicated their feelings on five relevant dimensions, responding on a 9-point scale with endpoints *not at all* and *very much* to a total of 10 items (two items for each dimension): To what extent (1a) do you feel competitive, (1b) are you motivated to compete, (2a) do you desire to have higher social status, (2b) are you motivated to have higher prestige, (3a) do you feel romantically aroused, (3b) are you motivated to attract a romantic partner, (4a) do you feel enthusiastic, (4b) do you feel excited, and (5a) do you feel frustrated, (5b) do you feel angry?

As seen in Table 1, the three stories elicited the intended feelings and motives. In particular, compared with the control and the courtship story, the competition story elicited a higher desire to compete ($ps < .01$) and a higher desire for status ($ps < .01$). In contrast, the courtship scenario elicited a higher desire to attract a romantic partner ($ps < .01$). Both the courtship and competition stories elicited little negative arousal (i.e., anger or frustration). Finally, the control story elicited similar levels of positive and negative arousal.

Aggression measures. After the motive-induction task, participants moved to a different task (consistent with the cover story). Recall that most participants in our sample population were personally familiar with the type of aggression-provoking situation used in the second pilot study and that men and women reported that such a situation led many of them to act aggressively. Thus, in the current experiment, participants considered being in that same situation wherein a same-sex person is publicly rude to them: "You're at a party and a man/woman you know from one of your classes carelessly spills a drink on you and does not apologize."

After considering being in the aggression-provoking situation, participants responded to a total of eight 9-point aggression items with endpoints *not at all* and *very much*. Four items were direct aggression behaviors involving face-to-face confrontation; the other four items were indirect aggression behaviors centering on avoiding face-to-face confrontation but later going behind the person's back to aggress against them indirectly.

For the four *direct* aggression items ($\alpha = .78$), participants indicated how likely they would be to (a) hit this person, (b) insult this person to his or her face, (c) push this person, and (d) get in this person's face. For the four *indirect* aggression items ($\alpha = .80$), participants indicated how likely they would be to (a) talk behind this person's back, (b) tell a friend an embarrassing secret they've heard about this person, (c) try to exclude this person from a social group, and (d) make up a lie about this person. All of the items were presented in random order. It is important to note that we

were not interested in whether the party insult scenario would provoke aggression (we already know that this kind of situation does lead to aggression, given the results of Pilot Study 2); instead, we were specifically interested in whether aggressive tendencies would be influenced by status competition or courtship motives, relative to the control condition.

Results

To examine the specific hypotheses of the study, we performed a series of planned comparisons for direct and indirect aggression. For all *predicted* differences (in this study and subsequent studies), we used directed tests (Braver, 1975; Rice & Gaines, 1994). Directed tests allocate .04 of a total alpha level of .05 to the predicted direction of a test statistic and .01 to the unpredicted direction (e.g., see Gangestad, Garver-Apgar, & Simpson, 2007).⁴

Direct aggression. For direct aggression, we predicted that competition motives would lead men to become more aggressive. Indeed, men in a competitive state were more likely to use direct aggression than were men in a control condition, $F(1, 172) = 4.58$, $p = .021$, $\eta^2 = .026$ (see Figure 2). For women, however, a motive to compete for status had no influence on direct aggression ($p > .5$). Thus, a motive to compete for status led men, but not women, to use more direct aggression.

Courtship motives did not influence men's ($p > .7$) or women's ($p > .4$) direct aggression. Thus, it appears that, at least for men, competition and courtship motives produced a different behavioral strategy, whereby competition—but not courtship—led men to be more aggressive.

Indirect aggression. We predicted that a motive to compete for status would lead women to become more indirectly aggressive. Consistent with this prediction, women motivated to compete for status were more likely to use indirect aggression than were women in the control, $F(1, 172) = 4.54$, $p = .021$, $\eta^2 = .025$ (see Figure 2). Women were also more indirectly aggressive when courtship motives were activated, $F(1, 172) = 5.02$, $p = .026$, $\eta^2 = .028$. Thus, it appears that both status and mating goals led to a similar aggression strategy for women. For men, neither competition nor courtship motives influenced indirect aggression (see Figure 3; $ps > .85$).

Discussion

The findings from the first experiment showed that a motive to compete for status with same-sex rivals led both men and women to become more inclined to aggress against a same-sex person who spilled a drink on them without apologizing. However, consistent with the differential costs and benefits of aggression for men and women, a status motive led men and women to use different types of aggression: Whereas men became more aggressive directly (e.g., pushing the person), women became more aggressive indirectly (e.g., excluding the person from a social group). Although previous work, including our two pilot studies, has shown that men are more likely to engage in direct aggression and women are more likely to engage in indirect aggression, the current experiment is

⁴ Directed tests have enhanced power to detect predicted effects relative to two-tailed tests but do not entail the problem of completely ruling out an unpredicted effect suffered by one-tailed tests (see Rice & Gaines, 1994).

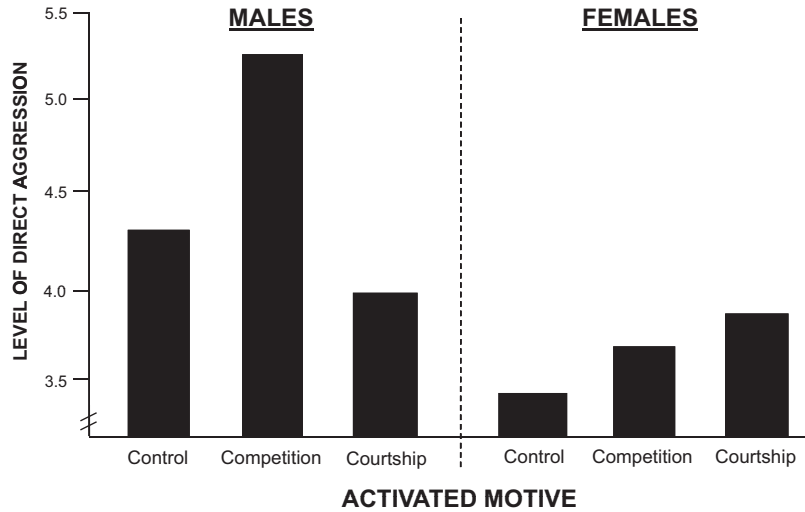


Figure 2. Influence of competition and courtship motives on responding to an insult with direct aggression (Experiment 1).

the first to demonstrate clearly that these aggression strategies can be specifically linked to status competition. That is, merely activating a desire for status can trigger these specific types of aggressive inclinations.

Because *intrasexual* selection (competing for status) is clearly related to *intersexual* selection (attracting a mate), it was possible that both competition and courtship motives would have the same effect on aggression. Indeed, both motives led women to become more indirectly aggressive. However, competition and courtship motives had different effects on men’s direct aggression: Whereas competition boosted direct aggression, courtship did not appear to influence men’s aggression, a finding we investigated further in Experiment 2.

Experiment 2: Aggression and Audience

Because intersexual courtship and intrasexual competition motives are clearly linked to reproduction, activating either motive

might be expected to trigger a similar response. Consistent with this logic, both competition and courtship motives produced a boost in women’s (indirect) aggression. However, competition and courtship motives had different effects on men’s aggression: Whereas status motives boosted men’s aggression, mating motives did not. Courtship motives may not have increased men’s aggression because, at least in Western cultures, women are generally not attracted to men who are physically aggressive in public (Sadalla et al., 1987). That is, for men who desire to attract a mate, being aggressive in front of prospective romantic partners might pose an additional cost by decreasing those men’s attractiveness. If so, men who are trying to attract a mate might be particularly motivated to control their direct aggression in front of a female audience. Indeed, the story used to induce courtship motives in Experiment 1 is likely to have led men to think of being in the presence of women. But if the audience were exclusively male, a mating motive might lead to the same outcome as a status motive,

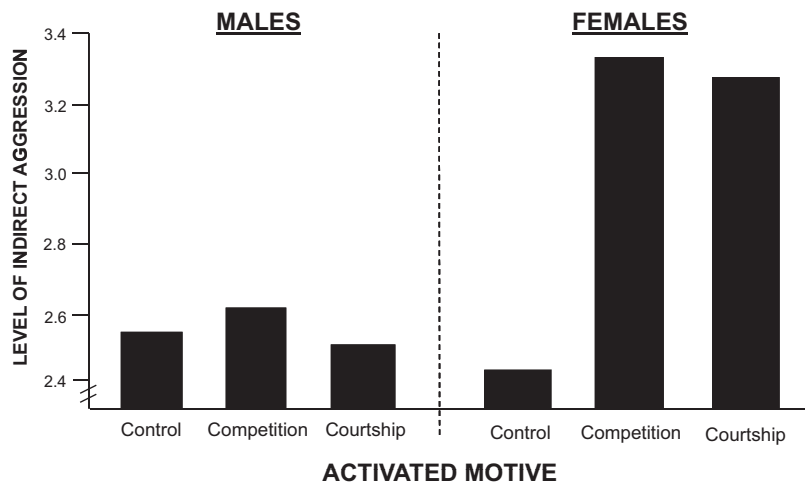


Figure 3. Influence of competition and courtship motives on responding to an insult with indirect aggression (Experiment 1).

leading men to become more directly aggressive because the costs of being perceived as less attractive by potential mates are removed.

For women in the first study, neither a motive to compete for status nor a motive to attract a mate influenced direct aggression. Although this lack of a boost in direct aggression for women is consistent with the large costs and small benefits of such aggression for women (Campbell, 1999), it is possible that a status or a courtship motive might nevertheless lead women to display direct aggression to particular audiences. That is, while the costs of direct aggression for women are always high, the benefits of women's displays of direct aggression might increase in front of a particular type of audience.

Experiment 2 tested how competition and courtship motives influenced direct and indirect aggression as a function of whether the audience was exclusively male or female. In addition, the study sought to address a potential problem from the initial study regarding the near-floor levels for the measures of men's indirect aggression. For instance, it is possible that status motives did not influence men's indirect aggression in the study because of the powerful influence of men's social norms for such behavior (e.g., see Goldstein, Cialdini, & Griskevicius, 2008; Nolan, Schultz, Cialdini, Goldstein, & Griskevicius, 2008; Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007). Thus, in Experiment 2, we investigated how competition and courtship motives influence indirect aggression with behaviors that are more socially acceptable for men than those used in Experiment 1.

Method

Participants. Three hundred thirteen participants (158 men and 155 women) from a large state university were recruited for the study as partial fulfillment of their class requirement. All participants came to the lab in groups and were each seated between partitions at a computer.

Design and procedure. The design of the experiment was a 2 (Participant Sex) \times 3 (Motive: competition vs. courtship vs. control) \times 2 (Aggression Type: direct vs. indirect) \times 2 (Audience Sex: male vs. female) mixed-factorial design. Participant sex, motive, and audience sex were between-participants factors; aggression type was a within-participant factor. The study used a procedure very similar to that used in Experiment 1, including inducing motives via the same short stories and using the same cover story. The only differences in this study were the addition of a manipulation of audience sex and a change in two of the four indirect aggression items.

After the motive-induction story, participants considered being in a situation in which a same-sex person spilled a drink on them at a party. However, the scenario made it explicitly clear that this event occurred in front of an audience made up of either men or women. Specifically, "Imagine you're at a party and a man (woman) you know from one of your classes carelessly spills a drink on you in front of several men (women) from your class, and does not apologize."

Participants then indicated their possible responses to the situation via direct and indirect aggression. For direct aggression, the same four items from Study 1 were used ($\alpha = .90$). For indirect aggression, we excluded the two items from Study 1 that produced the lowest means for men ("talk behind this person's back" and

"make up a lie about this person," both of which had a mean of 2.0 or less). We replaced them with two new items: "spread negative information that you've heard about this person" and "mention something bad you've heard about this person to other people who know them"; the new items were added to the two remaining items from Study 1 ("tell a friend an embarrassing secret you've heard about this person" and "try to exclude this person from a social group"). The indirect aggression composite had an alpha of .80.

Results

Direct aggression. To examine the specific hypotheses of the study, we performed a series of planned comparisons. For direct aggression, we predicted that a competition motive should lead men to be more aggressive, regardless of whether the audience was male or female. Indeed, there was no interaction between status and control motive and audience sex ($p > .85$). As seen in Figure 4, a motive to compete for status led men to be more directly aggressive, regardless of audience, $F(1, 307) = 3.13, p = .049, \eta^2 = .010$. This status-related boost in men's aggression is consistent with the earlier finding in which the sex of the audience was ambiguous.

In contrast with competition motives, we predicted that courtship motives would have a different effect on men's direct aggression, depending on the sex of the audience. Indeed, there was an interaction between courtship and control motive and audience sex, $F(2, 207) = 3.80, p = .033, \eta^2 = .018$. Consistent with specific predictions, when the audience was female, courtship motives did not influence men's aggression ($p > .80$). When the audience was male, however, courtship motives led men to be more aggressive, $F(1, 301) = 3.81, p = .033, \eta^2 = .012$ (see Figure 4). Thus, when the audience was male, both a motive to compete for status and a motive to attract a mate led men to become more directly aggressive.

For women and direct aggression, in Experiment 1, the results showed a slight (nonsignificant) rise in aggression in the competition and courtship conditions. In Experiment 2, we tested whether either of these two motives might boost women's direct aggression

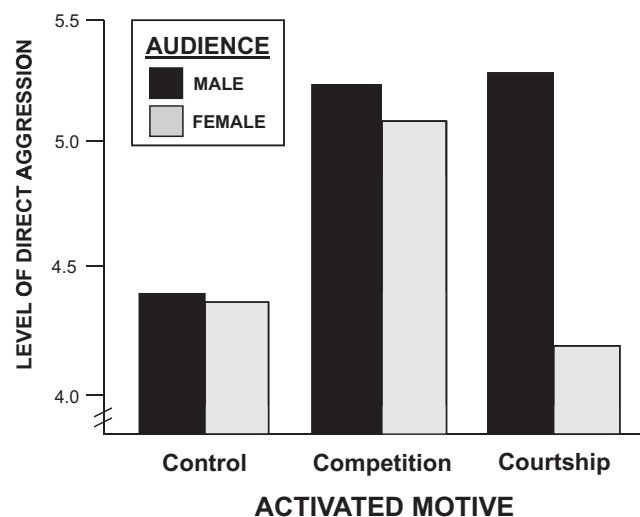


Figure 4. Men's direct aggression in response to an insult as a function of activated motive and audience sex (Experiment 2).

when the audience was explicitly male or female. Overall, neither motive led women to be significantly more directly aggressive in any condition (all $ps > .4$). The pattern of means for women's direct aggression across motive conditions was very similar to that of Study 1: control, $M = 3.37$ ($SD = 1.82$); competition, $M = 3.57$ ($SD = 1.95$); courtship, $M = 3.51$ ($SD = 1.78$). Thus, activating status-competition motives does not appear to lead women, on average, to become notably more directly aggressive.

Indirect aggression. The finding from the initial experiment showed that both competition and courtship motives increased women's indirect aggression. Consistent with those findings, both motives again led women to be more indirectly aggressive compared with the control, $F(1, 307) = 3.76$, $p = .033$, $\eta^2 = .012$, for both competition and control conditions (the difference between the two primes was nonsignificant, $p > .80$). Overall, the inclusion of two new items led the means for women's indirect aggression to be higher: control, $M = 3.77$ ($SD = 1.55$); competition, $M = 4.24$ ($SD = 1.65$); courtship, $M = 4.37$ ($SD = 1.86$). For indirect aggression in general, the sex of the audience had no effect (all $ps > .7$). Given that indirect aggression is, by definition, covert, the sex of the audience at the time of the insult is unlikely to be a key factor for indirect aggression.

In contrast with the near-floor means for men's indirect aggression in Experiment 1 (see Figure 2), the inclusion of two new indirect aggression items in the current study increased the overall means for men's indirect aggression: control, $M = 3.84$ ($SD = 1.55$); competition, $M = 3.88$ ($SD = 1.62$); courtship, $M = 3.73$ ($SD = 1.45$). And consistent with the findings from Experiment 1, neither a competition nor a courtship motive had an effect on men's indirect aggression, regardless of audience sex (all $ps > .8$). Thus, it appears that a motive to compete for status does not increase men's willingness to use indirect aggression, at least not with the context and types of aggressive behaviors that were examined in these studies.

Discussion

The second study again showed that, whereas a motive to compete for status leads to an increase in inclinations for direct aggression for men, it leads to an increase in inclinations for indirect aggression for women. In addition, these status-related aggression boosts did not appear to be influenced by the sex of the audience in the location of the initial insult. That is, a status-competition motive led men to be more directly aggressive toward other men, regardless of whether this aggressive display was being witnessed by other men or women. However, the sex of the audience made an important difference in men's aggression when they were motivated to attract a mate. Specifically, whereas courtship motives increased direct aggression when the audience was male, courtship motives did not increase men's direct aggression when the audience was female. This finding points to the context-specificity of aggression mechanisms, suggesting that an audience of prospective mates might lead a man to control his aggression when he is motivated to make a romantic impression.

For women's direct aggression, neither a motive to compete for status nor a motive to attract a mate led them to be more directly aggressive (regardless of the sex of the audience). Instead, women again responded to both motives with indirect aggression. Although this pattern of findings is consistent with the fact that direct

aggression is a high-cost, low-benefit strategy for women, we further explored women's direct aggression in Experiment 3.

Experiment 3: Aggression, Women, and Competition for Resources

As discussed earlier, the benefits of direct aggression for women are generally small: The public recognition of toughness is less important for women than for men, because high-status, dominant, or aggressive women do not enjoy much of a reproductive advantage (Campbell, 1999; Smuts, 1987). In conjunction with the especially high costs of direct aggression, women appear to use a lower-cost intrasexual competition strategy of indirect aggression. But although the benefits of direct aggression for women are generally low, there may be specific contexts in which the benefits are significantly higher.

Although men are much more likely to use direct aggression than are women, there is a strikingly high correlation—ranging from .80 to .99—between the rates of male and female violence across geographical areas (Campbell, Muncer, & Bibel, 2001). This means that, despite men's higher absolute rates of crime, violence for both sexes tends to be concentrated in areas with high unemployment, welfare dependency, and acute resource shortages (Brownfield, 1986; Farnworth, Thornberry, Krohn, & Lizotte, 1994). Thus, both women's and men's direct aggression appears to be responsive to a particular ecological context: resource scarcity (L. E. Cohen & Machalek, 1988). Indeed, in one vivid historical example, during a severe economic recession and widespread famine in France in 1789, a crowd of several thousand women stormed the palace at Versailles, wielding axes, bayonets, and pikes while crying out for bread; the women beheaded one of Marie Antoinette's bodyguards and called for the head of the Queen herself (Cadbury, 2002).⁵

Whereas the costs of direct aggression remain high, even when resources are scarce, the potential *benefits* become substantially higher: Aggression has more of an upside when a woman is threatened with starvation or loss of material possessions than if she does not fight back. Thus, whereas the first two experiments suggest that women do not generally use direct aggression to compete for status, women might be more inclined to use direct aggression when motivated to compete for resources that aid survival (Campbell, 1999). Experiment 3 examined how men's and women's aggression is influenced by a motive to compete for status versus a motive to compete for resources. Drawing from the theories of sexual selection and differential parental investment, we predicted that a motive to compete *for status* would lead to more direct aggression for men but not for women (as in the first two studies); drawing from the theory of natural selection, however, we predicted that a motive to compete *for resources* would increase direct aggression for both sexes (Campbell, 1999).

Finally, whereas an evolutionary perspective posits that aggression evolved via both sexual and natural selection to serve several

⁵ Consistent with the functional nature of aggression, similar context-dependent patterns of hostility have recently been uncovered among female chimpanzees. Although aggression among female chimps is generally rare, increased competition over scarce resources and feeding territories has been found to result in male-like levels of intrasexual aggression among females (Muller, 2007).

possible functions, the same perspective holds that selection shapes human psychology to be contextually sensitive (Gangestad, Haselton, & Buss, 2006; Kenrick, Li, & Butner, 2003; Tooby & Cosmides, 1992). Thus, a motive to compete for resources—even in a resource-scarce environment—should not produce blind aggression without regard for context. One recurring context that drastically changes the costs of direct aggression, especially aggression instigated by an insult to one's honor, is having a family: A married parent has much more to lose in a physical altercation than does a childless, unmarried individual of the same age (Wilson, Daly, & Pound, 2002). Consistent with this logic, marriage has been shown to reduce men's testosterone levels, particularly for men who have children (Gray, Kahlensberg, Barrett, Lipson, & Ellison, 2002), and marriage appears to reduce same-sex violence (Daly & Wilson, 2001). Thus, in addition to including a condition in which participants are motivated to compete for scarce resources (whereby the participants are unmarried and without children), we included a second resource-competition condition in which participants were additionally primed with cues of being a married parent. That is, participants read the identical story used to prime resource competition, except that the story contained brief references to being married and having children. Given that direct aggression over an insult for a married parent has higher costs because offspring are strongly dependent on parents for survival, we predicted that, whereas a motive to compete for scarce resources *as a childless, unmarried individual* would increase direct aggression, a motive to compete for scarce resources *as a married parent* would not.

Method

Participants. Three hundred fifty-two participants (141 men and 211 women) from a large state university were recruited for the study as partial fulfillment of their class requirement. All participants came to the lab in groups and were each seated between partitions at a computer.

Design and procedure. The experiment design was a 2 (Participant Sex) \times 4 (Competition Motive: status vs. resources [no family] vs. resources [with family] vs. control) \times 2 (Aggression Type: direct vs. indirect) mixed-factorial design. Participant sex and motive were between-participants factors; aggression type was a within-participant factor. The study used a procedure very similar to that in the previous studies, including inducing motives via short stories, using the same aggression items as in Experiment 2, and using the same cover story. The key difference in this study was the addition of two new competition-motive conditions and a slightly modified aggression scenario.⁶

Competition-motive inductions. At the beginning of the study, participants read either a control story or one of three stories designed to activate a particular type of competitive motive: status, resources (no family), or resources (with family). The status story was identical to that used for the status-competition motive in the first two studies. The two new resource-competition stories were designed to be similar to the status story, except that they varied on several key features.

In the resource-competition (no family) story, participants imagined having graduated from college at a time when the country was entering a recession. After spending months looking for work, spending all their savings, and knowing that they have no financial

support from friends or family, participants finally get a job at a large company. They are excited to have a job during tough times, but they learn that they will be in competition with two other (same-sex) individuals. As in the status-competition story, although one person will soon be fired, another person will have an opportunity to get job security and a bonus. The story ends as participants imagine feeling enthusiastic and motivated to compete to keep their scarce job.

The resource-competition (with family) story is nearly identical to the story above, except for a few key differences. Since having recently graduated from college, the person has already gotten married and has a small child. Both the person and the spouse are having a difficult time finding work during the economic recession, and they have no one to turn to but themselves. The story ends as participants imagine feeling enthusiastic and highly motivated to compete to keep their job—but are reminded of their family.

To examine whether the two resource competition stories elicited the intended feelings and desires, we had a different group of 41 participants (27 men and 14 women) read one of the two stories with the same instructions. Then, they indicated their feelings on five key dimensions: Three of the dimensions were identical to those examined for the stories used in Study 1 (positive arousal, negative arousal, and competitiveness), and two of the dimensions pertained to the new resource stories: To what extent (1a) are you concerned over money, (1b) do you feel worried about being poor, (2a) are you worried about being a good parent, and (2b) do you think about taking care of family? Results indicated that the stories elicited the intended feelings and desires. Specifically, whereas both the no-family and with-family stories elicited a high desire to compete ($M_s = 6.78$ and 6.30 , $SD_s = 1.50$ and 1.67 , respectively; $p > .33$) and much concern about resources ($M_s = 6.90$ and 6.91 , $SD_s = 1.71$ and 1.58 , respectively; $p > .95$), the with-family story elicited a much higher concern about family ($M_s = 6.28$ and 3.16 , $SD_s = 1.49$ and 1.01 , respectively; $p < .001$). Both stories also elicited similar levels of positive and negative arousal (all $p_s > .33$).

Results

Direct aggression. To examine the specific hypotheses of the study, we performed a series of planned comparisons. In line with the first two studies, a motive to compete for status increased men's direct aggression compared with the control, $F(1, 344) = 8.59$, $p = .003$, $\eta^2 = .024$. For women, a motive to compete for status, again, did not significantly influence direct aggression ($p > .6$).

In contrast with status competition, a motive to compete for resources (when the person was single and without a child) had a similar effect on men's and women's direct aggression (see Figure 5). Specifically, resource competition increased direct aggression for men compared with control, $F(1, 344) = 2.86$, $p = .058$, $\eta^2 =$

⁶ Participants considered being at a party where a same-sex person either carelessly flicked a cigarette toward them or carelessly flicked it on their folded jacket across the yard. Although it was possible that this minor (between-participants) difference could produce different responses, analyses indicated that the different motives influenced aggression in a highly similar fashion in both types of party scenarios (all interaction $p_s > .7$). Thus, the two similar scenarios were combined for the analyses.

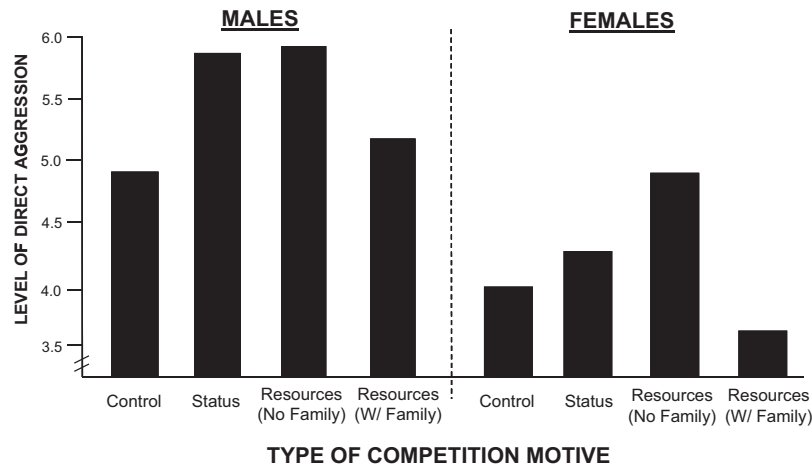


Figure 5. Influence of different types of competition motives on responding to an insult with direct aggression (Experiment 3).

.008, and it significantly increased direct aggression for women, $F(1, 344) = 5.86, p = .010, \eta^2 = .017$. Overall, it appears that, whereas competition for status only boosts direct aggression for men on average, competition for scarce resources boosts direct aggression for both men and women (at least when they do not have a spouse and child).

Although a motive to compete over scarce resources increased men's and women's direct aggression, we predicted that a small but crucial change in context would eliminate this effect. In particular, when men or women had a family (i.e., were married and had a young child), the same motive to compete for scarce resources did not increase men's or women's direct aggression when the person was insulted ($ps > .45$; see Figure 5).

Indirect aggression. For indirect aggression, we first examined how the three competition conditions influenced women's aggression compared with the control. As in the first two studies, a motive to compete for status increased women's indirect aggression, $F(1, 344) = 4.33, p = .024, \eta^2 = .012$. Similarly, a motive to compete for resources (for a single and childless woman) also trended toward producing an increase in indirect aggression, $F(1, 344) = 2.43, p = .075, \eta^2 = .007$. Similar to the findings for direct aggression, a motive to compete for resources (for a married mother) did not influence indirect aggression ($p > .35$). The overall means for women's indirect aggression across conditions were as follows: control, $M = 3.77$ ($SD = 1.88$); status $M = 4.43$ ($SD = 1.86$); resources (no family), $M = 4.32$ ($SD = 1.58$); resources (with family) $M = 3.39$ ($SD = 1.56$).

For men and indirect aggression, none of the three motive conditions produced a difference from control (all $ps > .6$). The overall means for men's indirect aggression across conditions were as follows: control, $M = 3.72$ ($SD = 1.80$); status, $M = 3.92$ ($SD = 1.95$); resources (no family), $M = 3.94$ ($SD = 1.19$); resources (with family), $M = 3.66$ ($SD = 1.46$).

Discussion

Direct aggression for women is a high-cost, low-benefit strategy for intrasexual competition. However, the benefits of direct ag-

gression for women (and men) may be greater when it involves competition for survival resources in times of scarcity (Campbell, 1999). Consistent with this logic, the findings of the current study showed that, whereas a motive to compete for status did not, on average, trigger direct aggression for women, a motive to compete for scarce resources did produce an increase in direct aggression for women and for men. Thus, although direct aggression seems to be generally used by men—but not by women—for intrasexual competition, it appears to be used by both men and women for resource competition.

Although competing for scarce resources increased direct aggression for men and women, an evolutionary perspective holds that aggression is not a tactic that is used independent of context. For example, whereas direct aggression is a high-cost and high-benefit strategy to compete for survival resources, such a strategy has much higher costs for a married parent than for a single, childless individual. That is, getting into a fist-fight over an insult is significantly more costly for a parent, because injury to the parent would also inflict costs on his or her family. Consistent with this logic, whereas a motive to compete for resources increased direct aggression for individuals when the participant imagined being single, the same motive did not increase direct aggression in response to an insult when the participant imagined having a family.

General Discussion

By considering different types of aggression (e.g., Archer, 2004; Bjorkqvist et al., 1992), and by explicitly considering the functional consequences of aggressive behavior (e.g., Archer, 2001; Buss & Duntley, 2006), researchers have moved beyond the question of whether men or women are "more aggressive." Indeed, we find that aggressive tendencies in both sexes are functionally tuned to the context-specific costs and benefits of behaving aggressively. Aggressive behavior has potentially extreme costs (by eliciting counter-aggression), but it may also carry various potential benefits: Not only can it enhance survival or immediate resource acquisition in certain contexts but it can also enhance the aggres-

sor's status and potential mating success, depending on who is watching. In a series of experiments, we examined how inclinations for direct and indirect aggression against a same-sex individual can be triggered by motives linked to intrasexual competition, intersexual courtship, and resource competition. Our investigation yielded three sets of findings, all converging to support a view of aggressive behavior as functionally tuned in context-specific and sex-specific ways.

First, a motive for status produced an increase in aggressive tendencies but did so differently for men and women: Whereas a status motive led to an increase in men's *direct* aggression (e.g., pushing a person), it led to an increase in women's *indirect* aggression (e.g., excluding a person from a social group). This finding is consistent with the present evolutionary framework, which posits that aggressive behavior reflects multiple context-dependent strategies. This framework presumes neither that aggression has one function nor that men and women are born with preset levels of aggression. Instead, aggression likely serves multiple functions and has different context-specific costs and benefits for men and women. Indeed, because direct aggression for women is an especially high-cost, low-benefit strategy for intrasexual competition, a motive to compete for status leads them, on average, to be more likely to use less costly indirect aggression.

Our second set of findings relates to a broader question regarding sexual selection. Specifically, *intrasexual* selection and *intersexual* selection both ultimately enhance reproductive success and are often difficult to distinguish among animals (Gould & Gould, 1989). Because of this close connection, we tested whether competition and courtship motives would have a similar effect on aggression. For women, both motives increased (indirect) aggression. For men, however, the influence of courtship motives on (direct) aggression depended on the nature of the audience watching the aggressive display. If the audience was male, both competition and courtship motives increased men's direct aggression. But if the audience consisted of women, a courtship motive did not boost men's direct aggression. This finding suggests that whereas both status and courtship motives might boost men's desire to respond aggressively, men's aggression is sensitive to context, whereby men might try to control their public aggression displays in front of prospective mates, because violent tendencies may decrease a man's attractiveness.

Consideration of audience sex raises another potentially important issue regarding the different consequences of aggressive behavior. If an individual's goal is to enhance status in the eyes of people of his or her own sex, then, despite its high costs, direct aggression is much more effective than indirect aggression. That is, an audience watching someone beat another person in a fight has direct evidence of both individuals' relative physical dominance, whereas an audience listening to someone attack another person behind the target's back may not be convinced that the rumor monger has higher status. This status-enhancement function is likely to be most relevant to the goals of men, for whom social status is directly linked to reproductive success (Li & Kenrick, 2006; Sadalla et al., 1987). Our findings suggest that the use of such a strategy is indeed directed at other men and is not necessarily designed to attract women.

Our third set of findings concerns women and direct aggression. Across our studies, a motive to compete for status did not increase women's direct aggression. But women's direct aggression did

increase when they were motivated to compete for scarce resources. Both findings are consistent with the notion that, although direct aggression is a high-cost strategy for women, it can lead to greater benefits when used as a tactic to compete for resources in times of scarcity (Campbell, 1999). Nevertheless, although a motive to compete for resources increased direct aggression, this effect was finely tuned to context: When the competition-motive manipulation included reference to the welfare of dependent children, this same competition motive no longer increased direct aggression instigated by an insult, likely because the relative costs of this kind of aggression are enhanced when children are involved (Taylor et al., 2000). Overall, across a series of experiments, we found that men's and women's aggressive tendencies are functionally tuned, depending on the context-specific and sex-specific costs and benefits of behaving aggressively.

Alternative Explanations

The current research was derived from a functional, domain-specific approach to cognition and behavior (e.g., Ackerman et al., 2006; Griskevicius, Goldstein, et al., 2006; Haselton & Nettle, 2006; Maner et al., 2005; Schaller, Park, & Kenrick, 2007) and was broadly inspired by theories of natural and sexual selection and differential parental investment (e.g., Andersson, 1994; Trivers, 1972). It would no doubt be possible to derive predictions regarding competition, courtship, and aggression from other theoretical perspectives. However, it is not clear whether any of these other perspectives would offer as parsimonious an account of the highly nuanced results obtained in this series of studies. For example, perhaps a relationship between courtship, competition, and aggression arises because of simple mechanisms of associative priming. The findings presented here, however, suggest that the associative networks involved in aggression are different for women and men, are differentially triggered by courtship and different types of competition, and depend on the sex of the audience. A functional approach to cognition is not an alternative to associative network models. But the functional model leads to more finely articulated predictions about the particular links between specific goals and specific cognitive and behavioral responses.

Similarly, a social learning model might suggest that men and women have been differentially rewarded for aggression. However, traditional social learning models would not have predicted the precisely patterned results we obtained concerning different types of aggression, different motives, and different contexts, including the sex of the audience and being a married parent. Moreover, it is not always clear whether men or women receive more rewards or more punishments for being aggressive. For example, both sexes—as children and as adults—are highly encouraged to be nice to others and are often severely punished for being aggressive. Yet we found that both men and women became more directly aggressive in some specific situations but not in others. A social-role theory may posit that it is part of the male role to be a dominant aggressor and part of the female role to be submissive peacemaker. However, social-role theories do not specify a priori why aggression is part of the male role when competing for status, regardless of the audience sex, but only part of the male role when attracting a mate if the audience is male. Moreover, if it is part of a woman's role to be nice, friendly, and

submissive, it is difficult explain why both competition and courtship motives led women to increase their inclinations to make up lies, exclude people from groups, and inflict psychological pain on others. Overall, the fact that different types of aggressive tendencies changed as a function of activating courtship and specific types of competition motives follows most directly from consideration of the theories of natural selection, sexual selection, and differential parental investment.

Neither social-role, social-learning, nor other culture-focused theories are incompatible with evolutionary accounts. Evolutionary theorists presume that social roles and social reinforcements across societies reflect evolved adaptations in men and women and arise through an adaptive interplay of learning and evolved predispositions (e.g., Kenrick, Trost, & Sundie, 2004; Schaller & Murray, 2008). We are not aware, however, of social-role or social-learning theorists who have offered a priori predictions that would match the articulated pattern of results obtained here, a pattern that follows directly from consideration of sexual selection and differential parental investment and a pattern that is highly consistent with the context-specific nature of male and female intrasexual aggression in different mammalian species (e.g., Muller, 2007; Wrangham & Peterson, 1996).

Limitations and Future Directions

One limitation of the current work is that our three experiments did not involve behavioral measures of aggression. Instead, the current research focused on the context-specific features of psychological adaptation for aggression. Future experimental research on status motives and actual aggression clearly would be useful. Nevertheless, there is good reason to believe that our experimental findings are likely to correspond to actual aggressive behaviors. For instance, our experimental findings on aggressive tendencies fit well with analyses of actual circumstances surrounding violent behavior (e.g., Daly & Wilson, 1988; Campbell et al., 2001), and they are also highly consistent with the findings from our two pilot studies, in which we examined people's recollections of aggressive behaviors in naturalistic settings. Furthermore, although we did not measure actual behavior, it is noteworthy that our items measured behavioral intentions, which, in comparison with attitudes, have been shown to have a relatively strong relationship to behaviors (e.g., Fishbein & Ajzen, 1975). Finally, participants in our studies appear to have responded as though there was a cost to being aggressive; if this was not the case, responses would have been closer to ceiling (or to floor, depending on the question) and showed less variance. After all, why not claim that you would definitely confront a person who just insulted you?

Future research might examine how the characteristics of the perpetrator or the participant influence aggression. In the current research, the person who spilled the drink was described ambiguously (e.g., "a man"). But competition motives might have a very different effect if this person were physically large or high in status. For instance, a man might be less likely to use direct aggression against a high-status man. Similarly, characteristics of the person being insulted might also influence aggression. A person's self-esteem in specific domains, for example, might lead to different aggression tactics (Kirkpatrick, Waugh, Valencia, & Webster, 2002). It would also be informative to examine different types of aggression-provoking situations; whereas a public insult

might lead to one type of response, being socially rejected might lead to different kinds of aggressive responses (Leary, Twenge, & Quinlivan, 2006). It might also be informative to examine how aggression is influenced by a person's sociosexual orientation (Simpson & Gangestad, 1991). For instance, direct aggression may be used more by individuals who prefer to pursue multiple sexual partners rather than a single committed relationship (see Gangestad, Simpson, Cousins, Garver-Apgar, & Niels Christensen, 2004), which entails different trade-offs (Gangestad & Simpson, 2000). Men who possess developmental stability (as reflected by relative physical symmetry), for instance, are more likely to have gotten into fights with other men, particularly ones that they themselves escalated (Furrow, Gangestad, & Armijo-Prewitt, 1998).

Conclusion

The current set of studies supports the notion that aggression can serve multiple evolutionary functions. Important among these is its use as a means to compete for status. Although direct aggression has obvious costs, it can provide important reputational benefits, sometimes leading men to aggress to impress. For instance, on the night when an insult led Charles Barkley to hurl a man through a plate-glass window, onlookers were quick to notice his actions: Barkley's reputation only grew as witnesses gushed to reporters in admiration of his feat ("Barkley arrested after bar," 1997). And although Barkley did pay a cost for his aggression (he was arrested minutes after the assault), the benefits of his aggressive display may have outweighed these costs. When asked by reporters as he was being arrested if he had any regrets for throwing a man through a window, Barkley responded: "I regret we weren't on a higher floor" ("Legend of Sir Charles," 1999).

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Received March 7, 2008

Revision received July 15, 2008

Accepted July 23, 2008 ■