



## Men don't just get mad; they get even: Revenge but not anger mediates gender differences in physical aggression

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### ABSTRACT

Past research indicates that men are more physically aggressive than women, but very little research has examined mediators of this gender difference. Indeed, the only established finding to date is that one plausible mediator – namely trait anger – shows no reliable gender difference whatsoever. Drawing on sexual selection theory and social-learning theories, we predicted that revenge may mediate this gender difference even though anger does not. Three studies using both personality questionnaires (Studies 1 and 2) and objective laboratory measures of aggression (Study 3) provided support for this contention. The results provide some of the first evidence for a reliable mediator of gender difference in physical aggression.

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### 1. Introduction

Men are more physically aggressive than women. This gender difference has been documented time and time again (see Archer (2004), Bettencourt and Miller (1996) and Eagley and Steffen (1986) for meta-analytic reviews). It has been found across different ages (Baillargeon et al., 2007; Tremblay et al., 1999) and different cultural groups (Archer, 2004). Moreover, it has been found using diverse methodologies, including self-report questionnaires (Archer, 2004), observational measures (Archer, 2004), objective laboratory measures (Bettencourt & Miller, 1996), and crime statistics (e.g., Daly & Wilson, 1988).

Despite this clear gender difference, psychologists have struggled to explain *why* men are more physically aggressive than women. Traditionally, explanations have highlighted either evolutionary pressures (e.g., Archer, 2009) or social-learning processes (e.g., Eagley & Wood, 2009; Wood & Eagley, 2002). A recent exchange between these two groups of theorists (Archer, 2009; Eagley & Wood, 2009) involved a great deal of speculation regarding potential mediators of the gender difference in physical aggression. Throughout this exchange, the only established empirical finding presented was that one plausible mediator – namely trait anger – exhibits no reliable gender difference whatsoever (see Archer (2004) for a meta-analytic review).

As such, the current investigation was designed to examine the psychological processes mediating the gender difference in physical aggression. It is important to note that our goal was not

to directly address the evolution versus social-learning debate (Archer, 2009; Wood & Eagley, 2002). Nonetheless, we drew upon existing evolutionary and social-learning theories to inform our predictions. We specifically proposed that while angry affect does not mediate gender differences in physical aggression, revenge motivation does. We conducted three studies using both personality questionnaires and laboratory measures to test this hypothesis.

#### 1.1. Evolutionary pressures for men to retaliate

Sexual selection theory is the most prominent evolutionary explanation of gender differences in physical aggression (Archer, 2009; Buss & Duntley, 2006; Clutton-Brock, 2007; Daly & Wilson, 1988). According to this theory, men are typically under greater evolutionary pressures to behave aggressively than women. Because women are sometimes unavailable for reproduction due to pregnancy, women are argued to be a more valuable reproductive resource for which men must compete. Men can do so by aggressively excluding other men from mating opportunities or by seeking to attract women. Evolutionary theorists have traditionally argued that men mainly seek to attract women by establishing a more dominant position in the social hierarchy (e.g., Buss, 1994).

According to Daly and Wilson (1988), these factors have converged and made men more prone to aggressive retaliation in the face of minor provocations. In order to deter male rivals from aggression and to achieve a dominant status, men need to establish a reputation for “toughness” (i.e., that they are not vulnerable to mistreatment by others). Thus, even minor insults demand swift and forceful retaliation.

Consistent with this, crime statistics (Daly & Wilson, 1988; Wilson & Daly, 1985) and laboratory experiments (Griskevicius et al., 2009) have both shown that men are more likely to respond

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to trivial provocations with extreme retaliation. A large proportion of murders can be attributed to men responding to minor provocations, but similar incidences are exceedingly rare among women (Daly & Wilson, 1988; Wilson & Daly, 1985). Moreover, laboratory experiments show that priming status goals leads men (but not women) to be more physically aggressive in the face of minor provocations (Griskevicius et al., 2009).

### 1.2. Social pressures for men to retaliate

While evolutionary and social-learning theorists frequently disagree, it is interesting to note that an emphasis on male retaliation is quite compatible with many social-learning theories (e.g., Bandura, 1973; Nisbett & Cohen, 1996; Wood & Eagley, 2002). Social-learning theorists have largely acknowledged that men are genetically predisposed toward greater physical strength than women (Eagley & Wood, 2009; Wood & Eagley, 2002). Because of this, men often occupy higher status positions across many (but not all) cultures, and they are often more responsible for providing resources as well (Eagley & Wood, 2009; Wood & Eagley, 2002).

Once placed in such social roles, basic social-learning processes could reinforce men for their physically aggressive behaviors (Bandura, 1973). Social rewards (e.g., verbal praise or status conferral) have been found to reinforce individuals for their aggressive actions (Geen & Pigg, 1970; Geen & Stonner, 1971, 1973; Staples & Walters, 1964). For example, being told that aggression is a sign of “masculinity and maturity” increases aggression in men (Baron, 1974). In cultures where men have privileged access to high-status positions, they are more likely to be reinforced in this manner. Moreover, there are several sources of data indicating that aggression is likely to result in status rewards. Aggression can be used as a punishment to deter other men from seeking the high-status positions and resources one desires (see Tedeschi & Felson, 1994). Men who are the victim of such aggressive actions can also use aggression to retaliate against their attackers, thus punishing them for their aggressive actions and discouraging such behavior in the future (e.g., Baron, 1971, 1974; Pisano & Taylor, 1971).

In combination with ecological features in the local environment, these basic social-learning processes can lead to increased rates of male physical aggression in some cultures compared to others. Nisbett and Cohen's (1996) culture of honor theory provides an apt illustration of this. This theory focuses on cultures which were originally based on a herding economy, such as the American South. In such cultures, the costs of theft were quite high, as men could lose their herd and thus their entire subsistence to a single act of theft. Men in these cultures were thus under great pressure to establish a reputation for toughness to discourage such thefts. Crime statistics (Nisbett, 1993; Nisbett & Cohen, 1996) and laboratory experiments (Cohen, Nisbett, Bowdle, & Schwarz, 1996) both support this theory, in that men from the American South are more likely to retaliate against trivial provocations (e.g., a minor insult) relative to men from the American North. In sum, the suggestion that men are under greater social pressure to retaliate is quite compatible with many social-learning theories (Baron, 1974; Nisbett & Cohen, 1996; Wood & Eagley, 2002).

### 1.3. Anger and revenge as related but distinct constructs

Based on the above-reviewed theories, some have suggested that gender differences in aggression may be mediated by individual differences in anger. After all, the emotion of anger is clearly associated with goals and action tendencies toward revenge (Roseman, Wiest, & Swartz, 1994), with approach motivation (Carver & Harmon-Jones, 2009), and with the associated neural signature of left-lateralized prefrontal activity (Carver & Harmon-Jones, 2009). Thus, it is plausible that men developed greater

proneness toward anger in order to motivate them to retaliate when provoked. There is only one problem with this argument. Study after study has shown that men are no more anger-prone than women (Archer, 2004; Campbell, 2006). Thus, anger clearly cannot mediate gender differences in physical aggression.

However, a close inspection of sexual selection theory (Archer, 2009; Buss & Duntley, 2006; Clutton-Brock, 2007; Daly & Wilson, 1988) and social-learning theories (e.g., Nisbett & Cohen, 1996) reveals that both theories refer most directly to *revenge* and not *anger*. While revenge and anger are certainly related constructs, they are nonetheless distinct. Conceptually, anger refers to a subjective emotional experience that is frequently elicited following provocation (McCullough, Bono, & Root, 2007; Spielberger, 1988; Wilkowski & Robinson, 2008); while revenge refers to the motivation to act aggressively toward one's provocateur (McCullough et al., 2007). Consistent with this distinction, we use the term *anger* to refer to an affective state, and we use the term *revenge* to refer to a motivation. We reserve the term *aggression* to refer to behavioral acts intended to harm another person (Baron, 1977), and we reserve the term *retaliation* to refer to instances of behavioral aggression that follow provocation (Martin, Watson, & Wan, 2000; Wilkowski & Robinson, 2008).

Empirically, there is evidence that angry affect and revenge motivation are related but distinct concepts. For example, Denson, Pederson, and Miller (2006, Study 3) found that measures of trait anger and trait revenge-planning were correlated at  $r = .54$ . Similarly, Fehr, Gelfand, and Nag (2010) found that state anger and state revenge motivation were correlated at  $r = .41$  in a meta-analytic review. These findings clearly indicate that anger and revenge are significantly related, but their correlations are not so high as to suggest equivalence.

Beyond such conceptual and empirical distinctions, there is evidence that revenge motivation can sometimes be associated with a very different emotion than anger. Specifically, revenge motivation is sometimes accompanied by positive emotions. The first source of evidence for this comes from neurological research suggesting that people feel more positive affect while pursuing revenge goals. Specifically, de Quervain et al. (2004) scanned participants while they were contemplating whether to retaliate against a “free-riding” partner who had taken an unfair share of money from them. During this time, activity in the striatum increased, and individuals who showed greater striatum activity subsequently spent a greater amount of money to punish their “free-riding” partner. Activity in the striatum has been repeatedly linked to reward processing and the pursuit of positive incentive stimuli (e.g., Knutson & Bhanji, 2006).

Follow-up research by Singer et al. (2006) also indicates a clear gender difference in this pattern. When men watched a “free-rider” undergo a painful procedure, they exhibited a clear increase in striatum activity, and this increase was correlated with their level of self-reported revenge motivation. However, women exhibited a different neurological response under these conditions, centered in the anterior cingulate cortex and indicative of empathy and shared pain. Thus, neurological research suggests that there is a gender difference in the tendency to experience positive affect while pursuing revenge-related goals.

Research also suggests that retaliating against one's provocateur can sometimes lead to feelings of satisfaction. Gollwitzer, Meder, and Schmitt (2011) provided participants with the opportunity to take revenge against a person who had given them an unfair, negative evaluation. When the other person sent a note indicating they understood that revenge was punishment for improper behavior, revenge-taking participants felt a great deal of satisfaction.

Finally, developmental research indicates that retaliatory acts can sometimes be motivated by the proactive pursuit of status,

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