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Empathy Inhibits Aggression in Competition:  
The Role of Provocation, Emotion, and Gender

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1 **Abstract**

2 Although the empathy-aggression relationship has been well documented, research has yet to  
3 establish whether emotions mediate and gender moderates this relationship in athletes, under  
4 conditions of low and high provocation. In this experiment, we assigned team-sport athletes  
5 to either a high ( $n = 40$ ) or a low ( $n = 40$ ) empathy group, and asked them to compete in a  
6 reaction-time task against a (fictitious) opponent, under conditions of low and high  
7 provocation. Empathy reduced aggression (i.e., intensity of electrical shock administered to  
8 the opponent) at low provocation in men, and at both low and high provocation in women.  
9 Guilt mediated the effect of empathy on aggression at low provocation in men; anger did not  
10 mediate any effects of empathy on aggression. Our findings indicate that the inhibitory effect  
11 of empathy on aggression and the mediating role of guilt are moderated by provocation and  
12 gender.

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14 *Keywords:* anger, experiment, guilt, morality, perspective taking.

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1                                   **Empathy Inhibits Aggression in Competition:**  
2                                   **The Role of Provocation, Emotion, and Gender**

3           Aggression, defined as verbal or physical behavior intended to harm another individual,  
4 who is motivated to avoid such treatment (Baron & Richardson, 1994), can cause significant  
5 psychological and physical harm to its recipients. For example, a high tackle or sucker punch  
6 in soccer or rugby could seriously injure a player and end his or her participation in sport.  
7 Aggression could also negatively affect performance by distracting attention from the task or  
8 inviting sanction from the officials (e.g., being sent off). Given the potential adverse  
9 consequences of aggression, identifying factors that reduce this behavior in sport is a  
10 significant research endeavor. The main aim of this research was to investigate the effect of  
11 empathy on aggression in athletes and to examine whether provocation and gender moderate,  
12 and emotions mediate, this effect.

13 **Empathy and Aggression**

14           Empathy has been defined as an other-oriented emotional response that is congruent  
15 with another person's perceived welfare (Batson, Early, & Salvarani, 1997). Empathy can be  
16 elicited via perspective taking by imagining how the other person feels (Batson et al., 1997;  
17 Hoffman, 2000). Several theorists have suggested that empathy should inhibit aggression  
18 (e.g., Eisenberg, 2000; Feshbach, 1975; Hoffman, 2000). Specifically, when individuals  
19 adopt the perspective of others and imagine how others feel, they are less likely to engage in  
20 aggressive behavior that may elicit distress in another person (Eisenberg, 2000). Indeed,  
21 empathy has been negatively associated with aggression in numerous cross-sectional studies  
22 (e.g., Jolliffe & Farrington, 2004; Miller & Eisenberg, 1988; Vachon, Lynam, & Johnson,  
23 2014) and some experiments (e.g., Phillips & Giancola, 2007). In the sport context, empathy  
24 has been inversely linked to antisocial behavior (Kavussanu & Boardley, 2009; Kavussanu,  
25 Stamp, Slade, & Ring, 2009; Kavussanu, Stanger, & Boardley, 2013). However, only one

1 experiment has been conducted in athletes. Although results showed that empathy reduced  
2 males' reported likelihood to aggress toward an opponent in sport (Stanger, Kavussanu, &  
3 Ring, 2012), researchers did not measure actual aggression. Therefore, there is still a need to  
4 experimentally investigate the effect of empathy on actual aggressive behavior in athletes.

5       Empathy has the potential to attenuate aggression in sport, a context in which  
6 individuals could be aggressive in their efforts to outperform others (see Bredemeier &  
7 Shields, 1986). Indeed, athletes report that aggressive and antisocial acts against competitors  
8 are more acceptable and frequent in sport than in other contexts (e.g., Kavussanu, Boardley,  
9 Sagar, & Ring, 2013; Kavussanu & Ring, 2015). Empathy could attenuate aggression in  
10 athletes by promoting consideration of others' feelings and welfare during competition.  
11 People can also behave impulsively and thereby act aggressively due to elevated arousal  
12 (Zillmann, 1988), which can be increased by competition (e.g., Cooke, Kavussanu, McIntye,  
13 & Ring, 2013). Perspective taking may strengthen one's cognitive ability to counteract the  
14 arousal that could lead to aggression (Richardson, Hammock, Smith, Gardner, & Signo,  
15 1994; Zillmann, 1988), thereby attenuating aggression in athletes during competition.

### 16 **Provocation and Gender**

17       Provocation, which refers to any action judged to be aversive, eliciting negative affect  
18 such as anger (e.g., Berkowitz, 1989), can lead to reactive aggression in sport (Maxwell,  
19 2004). Provocation has been positively associated with aggression in athletes (e.g., Maxwell,  
20 2004) and has the potential to negate the inhibitory effects of empathy on aggression (e.g.,  
21 Phillips & Giancola, 2007). Specifically, at low-to-moderate levels of provocation (e.g., low-  
22 moderate arousal or threat), perspective taking can reduce aggression, whereas at high  
23 provocation (e.g., high arousal or threat) the ability of perspective taking to reduce aggression  
24 can become greatly impaired (Richardson et al., 1994; cf. Zillman, 1988). Medium-to-high  
25 contact team sports, where interaction and physical contact among opponents are

1 unavoidable, provide ample opportunities for provocation. For example, players can use  
2 excessive physical force to win the ball (e.g., pushing, elbowing, or kicking) or mock  
3 opponents to get an edge over them during competition. Athletes, who compete in high  
4 contact team sports, tend to experience higher provocation while playing sport (Maxwell,  
5 Visek, & Moores, 2009). Thus, investigating aggression in athletes from a variety of team  
6 sports under different conditions of provocation is important.

7         A consistent research finding concerns gender differences in empathy and aggression:  
8 Women report higher empathy than men (Eisenberg & Lennon, 1983; Kavussanu et al.,  
9 2009), and men engage in more physical aggression than women, particularly when  
10 aggression is directed toward an individual of the same gender (Archer, 2004; Bettencourt &  
11 Miller, 1996). Gender could moderate the effect of empathy on aggression in competitive  
12 contexts. Based on the social roles theory (Eagly, 1987), men's desire for competence and  
13 superiority may increase their competitiveness and consequently their aggression in  
14 competitive contexts, compared to women, whose social role of being oriented around more  
15 communal traits (e.g., caring for others) is more congruent with empathy. Accordingly, men  
16 may be more likely to experience higher arousal and focus on their own needs in competitive  
17 contexts compared to women. Thus, the inhibitory effect of empathy on aggression may be  
18 weaker in men compared to women, during competition.

19         Past research has also shown that the gender difference in aggression is markedly  
20 attenuated by provocation (see Bettencourt & Miller, 1996). Provocation provides  
21 justification for aggression that liberates women from the usual constraints evoked by gender  
22 role norms (Bettencourt & Miller, 1996). In one experiment, empathy reduced aggression at  
23 low but not high provocation in men, and at high but not low provocation in women, during a  
24 competitive task (Phillips & Giancola, 2007). These findings indicate that the effect of  
25 empathy on aggression may vary depending on gender and levels of provocation.

## 1 **Empathy and Emotion**

2       Although empathy has been negatively associated with aggression in cross-sectional  
3 and experimental studies, the process through which this occurs has not been investigated. A  
4 variable that could explain this effect is the emotion of guilt, which can be experienced as a  
5 result of the empathic feelings for someone in distress following the realization of being  
6 personally responsible for their distress (Hoffman, 2000). Guilt is an adaptive emotion  
7 characterised by reparative action tendencies (i.e., making amends) following a transgression  
8 (Tangney, Stuewig, & Mashek, 2007) and is assumed to play a key role in regulating  
9 aggression. For instance, if one behaves aggressively and feels guilty as a response, they are  
10 less likely to engage in such acts in the future. Thus, people refrain from aggression because  
11 of anticipated affective sanctions if they were to engage in this or any other unethical  
12 behavior (Bandura, 1991). Studies have revealed an inverse relationship between proneness  
13 to experience guilt in social situations and aggression (e.g., Stuewig, Tangney, Heigel, Harty,  
14 & McCloskey, 2010).

15       Empathy has been consistently and positively linked with guilt (e.g., Leith &  
16 Baumeister, 1998; Stuewig et al., 2010). In past research, situational guilt mediated the  
17 negative relationship between perspective taking and interpersonal conflict (Leith &  
18 Baumeister, 1998), while anticipated guilt mediated the negative effect of empathy on male  
19 athletes' reported likelihood to aggress in sport (Stanger et al., 2012).

20       The negative relationship between empathy-based guilt and aggression may vary  
21 depending on provocation. When provoked, people may blame the provocateur and retaliate  
22 aggressively without feeling guilty about their actions (Bandura, 1991). Indeed, research has  
23 revealed that athletes report anticipate feeling less guilt if they had committed an aggressive  
24 act when they imagine themselves in a situation where they have been provoked (e.g.,  
25 Stanger, Kavussanu, Boardley, & Ring, 2013). However, it is not known whether guilt

1 mediates the inhibitory effect of empathy on aggression, when provoked during competition.  
2 Provocation could differentially influence guilt, and this could explain why the effect of  
3 empathy on aggression is negated following provocation.

4 An emotion that has been positively associated with aggression is anger (e.g., Novaco,  
5 1997), which is evoked by events that are interpreted as an offense. One of these events is  
6 provocation, which has been consistently linked to increased anger (Bond & Lader, 1986;  
7 Mohr, Howells, Gerace, Day, & Wharton, 2007; Parrott, Zeichner, & Stephens, 2003).  
8 Perspective taking may reduce anger following provocation by helping maintain a higher  
9 level of cognitive functioning; this, in turn, may reduce aggression (Mohr et al., 2007; cf.  
10 Zillmann, 1988). Research has reported an inverse relationship between perspective taking  
11 and likelihood to experience anger following an interpersonal provocation (Mohr et al.,  
12 2007). Given that empathy has been inversely associated with anger, and that anger has been  
13 positively linked to aggression, empathy may reduce aggression via its effect on anger.

#### 14 **The Present Research**

15 In sum, empathy has been inversely associated with aggression (e.g., Miller &  
16 Eisenberg, 1988; Phillips & Giancola, 2007). However, to date, only one experiment has  
17 examined the effect of empathy on aggression in athletes; this experiment investigated  
18 reported likelihood to aggress in a hypothetical situation (Stanger et al., 2012) rather than  
19 *actual* aggression. Moreover, no study has examined the process through which empathy  
20 inhibits aggression; guilt and anger are likely mediators. Finally, we do not know whether  
21 the effect of empathy on aggression is consistent for male and female team-sport players  
22 when responding to provocation. The first purpose of this experiment was to examine  
23 whether empathy inhibits athletes' aggression during a competitive task under conditions of  
24 low and high provocation and whether these effects are moderated by gender. A second



1 purpose was to investigate whether guilt and anger mediate the effects of empathy on  
2 aggression and whether these effects are moderated by gender.

### 3 **Method**

#### 4 **Experimental Design**

5 We used a mixed-factorial design, with empathy group (low, high) and gender as  
6 between-subjects factors and provocation (low, high) as a within-subjects factor. Each  
7 empathy group consisted of 20 men and 20 women.

#### 8 **Participants**

9 Eighty undergraduate students (40 men and 40 women), who competed in a team sport  
10 at the time of data collection, with a mean age of 19.49 ( $SD = 1.13$ ) years took part in the  
11 experiment. Participants competed in soccer ( $n = 30$ ), field hockey ( $n = 16$ ), rugby ( $n = 15$ ),  
12 netball ( $n = 8$ ), American football ( $n = 4$ ), basketball ( $n = 3$ ), korfbal ( $n = 2$ ) and lacrosse ( $n$   
13  $= 2$ ); they had competed at international/ national (9%), regional/ county (50%) and club  
14 (41%) levels for an average of 7.69 ( $SD = 3.72$ ) years.

#### 15 **Aggression Task**

16 We used the Taylor Aggression Paradigm (TAP; Taylor, 1967), a well-established  
17 paradigm (e.g., Giancola & Parrott, 2008) that enables researchers to study provoked and  
18 unprovoked aggression in a competitive context. Participants were asked to compete against  
19 an opponent in a series of reaction time trials, where winning and losing were predetermined.  
20 Unbeknownst to participants, the opponent was fictitious. On winning trials, participants  
21 administered an electrical shock of their chosen intensity to their (fictitious) opponent,  
22 whereas on losing trials, they received an electrical shock by their opponent; the shock was  
23 administered to elicit provocation. The order of events on this task is described below.

24 First, participants were shown a signal on a light display box, cuing them to select the  
25 shock intensity that they wished to administer to their opponent, if they were to win the trial,

1 by pressing one of ten buttons, numbered between 1 (*low intensity*) and 10 (*high intensity*).  
2 Between 6 and 7 seconds after their shock selection, participants were presented with a light  
3 stimulus indicating that they should press the response button as fast as possible. Four  
4 seconds later, they were shown a “Feedback” signal, which indicated whether they had won  
5 or lost that trial. When they won, participants were reminded of the shock intensity they  
6 selected for their opponent; when they lost, they were informed of the shock intensity  
7 selected by their opponent that they were going to receive shortly. The shock was  
8 administered to the participant or (fictitious) opponent 10 seconds following feedback, and  
9 the next trial commenced 10 seconds later.

10 Participants performed two blocks of 16 trials, separated by a 5-minute interval: Block  
11 1 was low provocation, and block 2 was high provocation. Participants received shock  
12 intensities between 1 and 4 ( $M = 2.5$ ) during the low provocation block and between 7 and 10  
13 ( $M = 8.5$ ) during the high provocation block. In each block, participants “won” 8 trials and  
14 “lost” 8 trials. Two transition trials were included at the start of the second block (which  
15 were not analysed), where participants received shock intensities of 5 and 6 to smoothen the  
16 transition between low and high provocation (Giancola, 2003). Thus, the order of trials that  
17 were won and lost and the shock intensity administered by the “opponent” was fixed across  
18 all participants in each block. The low-high sequence of provocation was used to increase the  
19 external validity of the task by simulating the rise of interpersonal provocation in real-life  
20 contexts and is in line with previous research (e.g., Giancola, 2003). During the aggression  
21 task, shocks ranged from 1 to 10, corresponding to participants’ pain threshold that ranged  
22 from 55% to 100% (see Giancola, 2003).

### 23 **Measures**

24 **Aggression.** We used two measures of aggression: unprovoked (or proactive)  
25 aggression, which was operationalized as the shock intensity chosen by the participant on the

1 first trial, that is, before receiving any shocks; and provoked (or reactive) aggression, which  
2 was operationalized as the shock intensity chosen on subsequent trials. We calculated  
3 separate scores for provoked aggression at low and high provocation by computing the mean  
4 shock intensity selected for each block.

5 **Guilt.** Guilt was measured after each block of trials on a Likert scale anchored by 1  
6 (*not at all*) and 5 (*extremely*). Participants were asked the extent to which they felt guilt  
7 about shocking their opponent (on winning trials) using the 5-item subscale from the State  
8 Shame and Guilt Scale (SSGS; Marschall, Saftner, & Tangney, 1994). An example item is “I  
9 felt remorse”. Marschall et al. (1994) provided psychometric support for this scale ( $\alpha = .82$ ).  
10 Its internal consistency was good for the first ( $\alpha = .77$ ) and second ( $\alpha = .79$ ) block of trials.

11 **Anger.** We used both self-report and physiological measures of anger. Supplementing  
12 self-reports with concurrent physiological measures can provide corroborative evidence for  
13 the presence of specific emotions (Cacioppo, Berntson, Larsen, Poehlmann, & Ito, 2000),  
14 because physiological measures can capture fleeting emotional experiences, are objective,  
15 and sensitive to changes in psychological states. Physiological responses were assessed  
16 around feedback, as this was when participants were reminded or informed of the shock level  
17 chosen by the “winner” of that trial, and, therefore, where we expected that emotional  
18 responses would be most pronounced. Two autonomic responses that index emotional  
19 arousal elicited by anger are skin conductance (i.e., moisture level of the skin reflective of  
20 sweat gland activity) and heart rate (e.g., Stemmler, 2010). As both responses increase along  
21 with reported anger in reaction to provocation (e.g., Bond & Lader, 1986; Hoaken, Campbell,  
22 Stewart, & Phil, 2003), they were interpreted as indices of anger.

23 **Self-reported anger.** Self-reported anger was measured after each block of trials using  
24 the anger subscale of the Sport Emotion Questionnaire (Jones, Lane, Bray, Uphill, & Catlin,  
25 2005). Participants indicated the degree to which they felt “angry”, “annoyed”, “irritated”

1 and “furious” about receiving shocks on losing trials after each block. They responded on a  
2 5-point Likert scale anchored by 1 (*not at all*) and 5 (*extremely*). Jones et al. (2005) provided  
3 psychometric support for this scale ( $\alpha = .84$ ). Its internal consistency for the first ( $\alpha = .83$ )  
4 and second ( $\alpha = .92$ ) block was very good.

5 **Heart rate.** To assess heart rate, the electrocardiogram (ECG) was measured using  
6 silver/silver chloride electrodes (Cleartrace, ConMed) in a modified chest configuration. The  
7 electrocardiographic signal was amplified ( $\times 5000$ ) and filtered (1–100 Hz) using a Grass  
8 LP511 AC amplifier. Heart rate (beats per minute; bpm) was derived from the intervals  
9 between R-waves of the ECG and computed in half-second bins. We calculated the mean  
10 heart rate 2-4 seconds (peak response, see Figure 1) after receiving feedback about losing  
11 minus their instantaneous heart rate when feedback was given.

12 **Skin conductance.** Skin conductance was measured using silver / silver chloride  
13 reusable finger electrodes (Grass, F-EGSR) secured to the medial phalanx of the index and  
14 middle finger of the left hand. The skin conductance signal was amplified ( $\times 1000$ ) and  
15 filtered (1–100 Hz) using a Grass SCA1/T9 coupler and LP122 AC/DC amplifier. Skin  
16 conductance response (micro Siemens  $\mu\text{S}$ ) to feedback was calculated as the peak skin  
17 conductance 1-9 s after receiving feedback minus peak skin conductance 1-4 s before  
18 feedback. Both physiological signals were digitized at 2500 Hz with 16-bit resolution (Power  
19 1401, Cambridge Electronic Design) using Spike2 software (Cambridge Electronic Design).

## 20 **Dispositional Empathy**

21 Dispositional empathy was measured using the 7-item perspective taking and empathic  
22 concern subscales from the Interpersonal Reactivity Index (Davis, 1980). Participants were  
23 asked to rate how well the items described them, on a scale with anchors of 1 (*does not*  
24 *describe me well*) and 5 (*describes me very well*). Example items are “before criticizing  
25 somebody, I try to imagine how I would feel if I were in their place” for perspective taking,

1 and “I would describe myself as a pretty soft-hearted person” for empathic concern. In line  
2 with previous research (e.g., Kavussanu et al., 2009, 2013), a mean empathy score was  
3 calculated using all the items from the two-subcales and has shown very good internal  
4 consistency ( $\alpha = .77$  to  $.85$ ). The internal consistency was good in the current study ( $\alpha = .84$ ).

### 5 **Procedure and Empathy Manipulation**

6 First, the protocol was approved by the university ethics committee. Participants were  
7 randomly assigned to one of the two empathy groups and were tested individually. Upon  
8 arrival at the laboratory, they were told that the study was concerned with the influence of  
9 competition on reaction time. Following consent, they completed a pre-experimental  
10 baseline measure of dispositional empathy to check that there were no group differences in  
11 this variable in case it had a confounding effect on the empathy manipulation or aggression  
12 during the task. After instrumentation, the participant’s pain threshold was determined; we  
13 used an ascending method of limits, in which a series of 500  $\mu$ s square wave electrocutaneous  
14 stimulations increased by 0.5 mA until participants reported the shock as painful, followed by  
15 an up-down staircase method around the reported painful stimulus (Edwards, Ring, McIntyre,  
16 & Carroll, 2001). The stimulus was delivered to the dorsal surface of the right forearm, 20  
17 cm above the wrist-fold using a constant current stimulator (DS7A, Digitimer) and a  
18 nociception-specific electrode (Kaube, Katsavara, Käufer, Diener, & Ellrich, 2000).

19 Next, participants were familiarised with the aggression task by completing eight  
20 practice trials, and they were informed that they had to wait until their “opponent” was ready  
21 to start the task. During this time, they were administered one of two empathy manipulations,  
22 adapted from previous research (Batson et al., 1997). Participants in the high-empathy group  
23 were instructed: “*Imagine how your opponent feels about what you do to him/her and how*  
24 *the shocks affect him/her. Try to feel the full impact of what this person is going through and*  
25 *how he/she feels as a result.*” Participants in the low empathy group were instructed: “*Take*

1 *an objective perspective toward what happens. Try not to get caught up in how your*  
2 *opponent might feel: just remain objective and detached.”* Participants confirmed that they  
3 understood the instructions before beginning the task. To reduce potential experimenter bias  
4 effects on participant responses, participants read the empathy manipulation, and the  
5 aggression task was run automatically by the computer with no experimenter involvement.

6 As the sex of the opponent may influence how aggressive participants are during the  
7 task (Archer, 2004), and athletes typically compete in same-sex teams, participants were told  
8 that they were competing against someone of the same sex, located in an adjacent room.  
9 During the 5-minute interval between blocks, and at the end of the second block of trials, they  
10 completed self-report measures of guilt (Marschall et al., 1994) and anger (Jones et al., 2005).  
11 We measured guilt with respect to winning trials (i.e., when participants shocked their  
12 opponent), and anger with respect to losing trials (i.e., when participants were shocked),  
13 because aggressive actions performed by us may elicit guilt, whereas those performed against  
14 us may elicit anger (Prinz, 2006). Finally, participants were interviewed to examine the  
15 effectiveness of the deception and debriefed.

16 **Deception manipulation.** A series of steps were taken to convince participants that  
17 they were competing against an opponent. Another experimenter entered the laboratory  
18 twice: (a) to confirm that the “other participant” had arrived and (b) to borrow some  
19 equipment and provide an update on the progress of the instrumentation of the “other  
20 participant”. Participants were interviewed for suspicion about the aims of the study and the  
21 fictitious nature of the opponent. Six (4 men and 2 women) of the eighty-six participants  
22 suspected that they were not competing against a real opponent, and, therefore, their data  
23 were not analysed or reported here, leaving a sample of 80 participants.

## 24 **Results**

### 25 **Effects of Empathy on Aggression**

1 Prior to the main analyses, we examined whether participants in the two empathy  
2 groups differed in dispositional empathy (Davis, 1980). A 2 Group (low empathy, high  
3 empathy) Analysis of Variance (ANOVA) verified that there were no group differences in  
4 this variable,  $F(1, 76) = 1.67, p = .20, \eta_p^2 = .02$ . Below we have reported analyses that  
5 pertain to the effect of manipulated empathy on unprovoked and provoked aggression.

6 **Unprovoked aggression.** We examined the effect of empathy on unprovoked  
7 aggression, using a 2 Group (low empathy, high empathy)  $\times$  2 Gender (men, women)  
8 ANOVA. Gender was included in this and subsequent analyses to determine whether the  
9 effect of empathy was uniform across gender. This analysis revealed main effects for  
10 empathy group,  $F(1, 76) = 4.70, p = .03, \eta_p^2 = .06$ , and gender,  $F(1, 76) = 10.09, p < .01, \eta_p^2$   
11  $= .12$ , on unprovoked aggression. The high empathy group ( $M = 3.38, SD = 2.16$ ) was less  
12 aggressive than the low empathy group ( $M = 4.45, SD = 2.49$ ), and men were more  
13 aggressive ( $M = 4.70, SD = 2.47$ ) than women ( $M = 3.13, SD = 2.02$ ). There was no group  $\times$   
14 gender interaction,  $F(1, 76) = 0.02, p = .88, \eta_p^2 = .00$ .

15 **Provoked aggression.** We examined the effect of empathy on aggression at different  
16 levels of provocation, using a 2 Group  $\times$  2 Gender  $\times$  2 Provocation (low, high) ANOVA. We  
17 found main effects for group,  $F(1, 76) = 11.54, p < .001, \eta_p^2 = .13$ , gender,  $F(1, 76) = 19.54, p$   
18  $< .001, \eta_p^2 = .21$ , and provocation,  $F(1, 76) = 189.96, p < .001, \eta_p^2 = .71$ , as well as a Group  $\times$   
19 Gender  $\times$  Provocation interaction,  $F(1, 76) = 4.02, p < .05, \eta_p^2 = .05$  (see Figure 2). Post-hoc  
20 planned contrasts showed that at *low provocation*, both men ( $p < .02$ ) and women ( $p < .02$ ) in  
21 the high empathy group were less aggressive than those in the low empathy group; men were  
22 also overall more aggressive than women ( $p < .01$ ). However, at *high provocation*, men were  
23 equally aggressive in the two groups; thus, empathy had no effect on men at high  
24 provocation. In contrast, women in the high empathy group were less aggressive than women  
25 in the low empathy group ( $p < .01$ ); men were more aggressive than women only in the high

1 ( $p < .001$ ) empathy group. Thus, at low provocation, empathy affected aggression in men  
2 and women similarly, but at high provocation empathy affected aggression only in women<sup>1</sup>.

### 3 **Effects of Empathy on Emotion**

4 **Guilt.** A 2 Group  $\times$  2 Gender  $\times$  2 Provocation ANOVA on guilt revealed main effects  
5 for group,  $F(1, 75) = 6.86, p = .01, \eta_p^2 = .08$ , and provocation,  $F(1, 75) = 22.83, p < .001, \eta_p^2$   
6  $= .23$ , but not gender. Specifically, the high empathy group ( $M = 1.68, SD = 0.46$ )  
7 experienced more guilt over shocking their opponent than the low empathy group ( $M = 1.42,$   
8  $SD = 0.41$ ). In addition, feelings of guilt were higher during low provocation ( $M = 1.67, SD$   
9  $= 0.56$ ) than high provocation ( $M = 1.42, SD = 0.46$ ). There were no interaction effects.

10 **Anger.** A 2 Group  $\times$  2 Gender  $\times$  2 Provocation, Multivariate Analysis of Variance  
11 (MANOVA) on the three indices of anger revealed no effect of empathy. There was a main  
12 effect for provocation,  $F(3, 73) = 16.51, p < .001, \eta_p^2 = .40$ . Follow-up ANOVAs showed  
13 that provocation affected reported anger,  $F(1, 75) = 18.88, p = .001, \eta_p^2 = .20$ , which was  
14 more intense during high ( $M = 2.23, SD = 1.11$ ) than low ( $M = 1.85, SD = 0.79$ ) provocation;  
15 heart rate,  $F(1, 75) = 10.63, p = .002, \eta_p^2 = .12$ , which became faster following feedback  
16 during high ( $M = 2.10, SD = 4.04$  bpm) than low provocation ( $M = 0.99, SD = 3.63$  bpm); and  
17 skin conductance,  $F(1, 75) = 12.74, p = .001, \eta_p^2 = .15$ , which was greater following feedback  
18 during high ( $M = 0.05, SD = 0.25$   $\mu$ S) than low ( $M = -0.04, SD = 0.17$   $\mu$ S) provocation<sup>2</sup>.  
19 Thus, all indices of anger were greater at high than low provocation.

### 20 **Mediation Analysis**

21 Given that empathy did not influence anger, this emotion was not considered a  
22 mediator. As we found main effects for empathy and provocation on guilt and aggression,  
23 and an empathy  $\times$  gender  $\times$  provocation interaction on aggression, we conducted mediation  
24 analysis at low and high provocation, separately. To examine whether guilt mediated the  
25 effect of empathy on aggression, we performed bootstrapping, which is one of the most



1 powerful methods that best controls for Type I error, when testing for indirect effects (Hayes,  
2 2009; Preacher & Hayes, 2004), using the PROCESS macro for the Statistical Package for  
3 the Social Sciences (SPSS) v2.1 (Hayes, 2013). When the confidence interval for an indirect  
4 effect does not contain zero, there is evidence of mediation. Each model was run with 5,000  
5 bootstrapped samples of the indirect effect of guilt for which we report the 95% bias  
6 corrected bootstrap confidence intervals (CI).

7 In the total sample, the indirect effect of guilt was significant at low provocation (point  
8 estimate =  $-0.41$ , 95% CI =  $-0.95, -0.10$ ), but not at high provocation (point estimate =  $-$   
9  $0.19$ , 95% CI =  $-0.68, 0.01$ ). We examined whether the indirect effect of guilt was  
10 moderated by gender at low and high provocation, by calculating the index of moderated  
11 mediation (available in the PROCESS macro for SPSS; Hayes, 2013), which equates to the  
12 difference between the two conditional indirect effects of guilt for men versus women  
13 (Hayes, 2015). If the confidence interval of this index excludes zero, there is evidence of  
14 moderated mediation. At low provocation, a significant indirect effect for guilt was found in  
15 men as shown in Figure 3A (point estimate =  $-0.75$ , 95% CI =  $-1.71, -0.24$ ), but not in  
16 women (Figure 3B) (point estimate =  $-0.10$ , 95% CI =  $-0.73, 0.06$ ); the index of moderated  
17 mediation for this model was significant ( $0.64$ , 95% CI =  $0.01, 1.63$ ). At high provocation,  
18 there was no significant indirect effect of guilt for men (point estimate =  $-0.29$ , 95% CI =  $-$   
19  $1.33, 0.02$ ) or women (point estimate =  $-0.08$ , 95% CI =  $-0.79, 0.13$ ); the index for  
20 moderated mediation was not significant ( $0.21$ , 95% CI =  $-0.39, 1.21$ ).

## 21 **Discussion**

22 Previous research has shown that empathy inhibits aggression and that guilt and anger  
23 have been linked to both empathy and aggression (e.g., Miller & Eisenberg, 1988; Mohr et  
24 al., 2007; Stanger et al., 2012; Stuewig et al., 2010). However, the effect of empathy on  
25 athletes' *actual* aggression while engaging in competition has not been examined. In this

1 experiment, we investigated the effect of empathy on aggression in athletes during a  
2 competitive motor task. We also examined whether gender and provocation moderate this  
3 effect, and whether guilt and anger act as mediators in this process.

#### 4 **The Effects of Empathy on Aggression**

5 In line with our hypothesis, empathy reduced participants' aggression (both unprovoked  
6 and provoked) during the reaction-time task. The effect was small-to-medium for  
7 unprovoked aggression and medium for provoked aggression. These findings are consistent  
8 with previous research investigating the relationship between trait empathy and antisocial  
9 behavior in sport (e.g., Kavussanu & Boardley, 2009; Kavussanu et al., 2009, 2013). Our  
10 findings also support and extend the results of another experiment that has found a link  
11 between empathy and athletes' reported likelihood to aggress (Stanger et al., 2012), by  
12 showing that empathy can attenuate *actual* aggression during competition.

13 Our findings support previous research showing that perspective taking can play an  
14 important role in reducing aggression towards out-group members in sport, such as opponents  
15 (see Decety & Cowell, 2014). Similar to Phillips & Giancola (2007), we found that empathy  
16 reduced aggression at low provocation, but not high provocation, in men. However, although  
17 Phillips and Giancola (2007) found that empathy reduced aggression in women only at high  
18 provocation, we found that empathy reduced aggression in women, at both low and high  
19 provocation. This slight discrepancy in the findings between the two studies may be due to  
20 the composition of the two samples, which may have led to variation in aggression.  
21 Specifically, Phillips and Giancola (2007) found that female university psychology students,  
22 who were presumably not all athletes, selected lower intensity shocks, at low provocation ( $M$   
23 = 2.5), than our female participants ( $M = 3.7$ ), who competed in team sports. Athletes have a  
24 tendency to perceive aggression as legitimate during competition (Bredemeier & Shields,

1 1986). Perhaps the higher aggression by athletic women in our sample provided more scope  
2 for empathy to reduce aggression at low provocation compared to previous research.

3 At high provocation, empathy reduced aggression only in women, in line with previous  
4 studies (Philips & Giancola, 2007; Richardson et al., 1994). Thus, the suppressing effect of  
5 empathy on aggression was over-ridden at high provocation in men, but not in women.

6 Women may require higher provocation to neutralize the inhibitory role of empathy on  
7 aggression, particularly during same-sex interactions (e.g., Richardson et al., 1994). It has  
8 been suggested that female-female interactions may result in lower perceived threat in  
9 relation to aggressive responding than male-male interactions (e.g., Richardson et al., 1994).

10 Accordingly, women may have interpreted high provocation as lower threat than men,  
11 thereby enabling perspective taking to suppress aggression as well as potentially prime them  
12 to conform to their social gender role. In contrast, men who were competing against other  
13 men, and whose social role is oriented around instrumental traits (e.g., superiority), may have  
14 interpreted high provocation as high threat, thereby behaving more impulsively and  
15 overriding the ability for perspective taking to mitigate aggression (Richardson et al., 1994;  
16 Zillmann, 1988). In sum, our findings indicate that empathy can reduce reactive aggression  
17 in team sport athletes in competition. However, the suppressing effect of empathy on  
18 aggression occurs only in women at high provocation.

### 19 **The Mediating Role of Emotion**

20 We examined two emotions as potential mediators of the effect of empathy on  
21 aggression: guilt and anger. Guilt explained the suppressive effect of empathy on aggression,  
22 but this effect was moderated by gender and provocation. Specifically, at low provocation,  
23 guilt mediated the effect of empathy on aggression in men but not in women. There was no  
24 mediation effect at high provocation. This could be attributed to the suppressing effect of  
25 empathy on aggression being over-ridden. Therefore, our findings suggest that empathy can

1 lead to guilt in sportsmen under low provocation, but the self-regulatory role of empathy and  
2 guilt on aggression is neutralized at high provocation.

3       These findings are in line with evidence that empathy is positively linked with guilt  
4 (Leith & Baumeister, 1998; Tangney et al., 2007), which has been associated with lower  
5 aggression (Stuewig et al., 2010; Tangney et al., 2007). Thus, in men, empathy increases  
6 feelings of guilt about potentially harming another, which in turn, should help them refrain  
7 from committing aggressive acts in the future. However, when provoked, men may blame  
8 the provocateur, and this may explain why the role of guilt as an empathic response in the  
9 regulation of aggressive conduct was neutralised at high provocation (cf. Bandura, 1991;  
10 Stanger et al., 2013). Future research should identify the factors that mediate the effect of  
11 empathy on aggression in sportswomen.

12       Contrary to our hypothesis, empathy did not influence anger, perhaps due to the  
13 experimental task and the perceived intentionality of aggression by the opponent.  
14 Specifically, participants were informed of the shock intensity that they received on losing  
15 trials, which they believed was chosen by their opponent. This was an intentional behavior  
16 by the “opponent”, and participants may have felt that their opponent was trying to hurt them  
17 as only a small proportion of losing trials resulted in the lowest intensity shocks (i.e., shock  
18 level 1). Thus, participants “knew” that their opponent was intentionally selecting the higher  
19 intensity shocks. When aggression is perceived as intentional, individuals experience  
20 reduced empathic reactions as well as increased anger (Betancourt & Blair, 1992). Thus,  
21 empathy may not reduce anger during competition among individuals from team sports when  
22 they perceive that they are provoked intentionally by an opponent.

### 23 **Practical Implications**

24       Our findings have some practical implications. First, they suggest that empathy could  
25 reduce aggression under conditions of low provocation regardless of one’s gender, and at

1 high provocation, in women. Several studies have shown that empathy can be enhanced  
2 using the appropriate training. For example, similar to previous research (e.g., Pecukonis,  
3 1990), athletes could be presented with video-taped real-match situations involving  
4 aggressive behaviors, asked to try to take the other person's perspective, imagine how he or  
5 she feels, and think about the implications that these actions might have for others. Such  
6 experiences could enhance athletes' empathy, thereby reducing their frequency of aggressive  
7 behavior. Second, given that provocation increased anger for both genders and negated the  
8 suppressing effect of empathy on aggression in men, practitioners could teach strategies to  
9 reduce emotional arousal associated with perceived interpersonal provocation, such as  
10 cognitive restructuring and attribution training. Such strategies may need to be considered in  
11 conjunction with empathy training to reduce provoked aggression, particularly for men.

### 12 **Limitations of the Study and Directions for Future Research**

13 Although this research has revealed some novel findings, it also has some limitations,  
14 which should be considered when interpreting our findings. First, we measured aggression  
15 during the TAP, which is performed in the laboratory, has received extensive support for its  
16 validity (e.g., Giancola & Parrott, 2008), and involves a competitive motor task performed  
17 under different levels of provocation. Although our task contained some elements found in  
18 sport (movement, competition, provocation), and our findings have high internal validity,  
19 their generalizability to real-world contexts needs to be further investigated. Future research  
20 examining aggression should employ a more ecologically valid task in the laboratory, modify  
21 the TAP to simulate real world sport, and conduct a field experiment to determine whether  
22 the current findings are replicated in real sport contexts.

23 Second, our study investigated aggression in same-sex dyads, a feature that simulated  
24 competitive sport, where athletes typically compete against individuals of the same sex.  
25 Therefore, our results can only be generalized to same-sex dyads. We do not know how

1 participants would respond if they were told they were competing against someone of the  
2 opposite sex. Future research should examine this issue. It is also possible that the effects of  
3 empathy differ based on the relationship with the opponent (e.g., Archer & Latham, 2004), or  
4 other characteristics of the opponent, such as the opponents' perceived level of harmful intent  
5 (Archer, 2004). It would be interesting to determine the extent to which empathy mitigates  
6 aggression, when the relationship with the opponent, levels of perceived intentionality, and  
7 the importance of the event, vary.

8         Given the experimental design of the study, an inherent limitation is the potential for  
9 demand characteristics. For instance, completion of certain measures (e.g., assessing anger  
10 and guilt) may have led participants to try and guess the true nature of our study, which could  
11 have influenced their responses. However, this was minimised with the deception protocol,  
12 and in the post-task interview, where we checked that participants perceived that they were  
13 competing against an opponent. Finally, our findings could be extended by investigating the  
14 effects of empathy training in competitive sport.

## 15 **Conclusion**

16         Our experiment has shown that empathy reduces aggression in men and women and  
17 provided novel evidence that guilt plays a role in explaining some of these effects, especially  
18 in men. Provocation led to less guilt about aggressing and more anger, making aggressive  
19 conduct more likely. Our findings underscore the importance of emotion in regulating  
20 reactive aggression. They show that empathy could be beneficial in tackling aggression in  
21 athletes, although its effects differ depending on gender and level of provocation.

22

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## 1 Endnotes

2 <sup>1</sup> Due to the number of reported analyses, readers may wish to make statistical  
3 adjustments (e.g., Bonferroni corrections) to our findings. Partial eta-squared ( $\eta_p^2$ ) is  
4 reported, which equals the adjusted  $R^2$  obtained in regression analyses (Tabachnick & Fidell,  
5 2007); values of .02, .13 and .26 for  $\eta_p^2$  indicate small, medium and large effect sizes,  
6 respectively (Cohen, 1992).

7 <sup>2</sup> Heart rate and skin conductance have been associated with fear and anxiety – in  
8 addition to anger - in previous research (e.g., Stemmler, 2010). Therefore, we measured  
9 participants' self-reported fear and anxiety to check whether these physiological measures  
10 were more reflective of anger than fear and anxiety during the task. Fear was assessed using  
11 five adjectives (scared, afraid, frightened, fearful and panicked), while anxiety was measured  
12 with five adjectives (anxious, apprehensive, nervous, tense and uneasy) from the Sport  
13 Emotion Questionnaire (Jones et al., 2005). Results revealed that fear did not change from  
14 low ( $M = 1.53, SD = 0.67$ ) to high ( $M = 1.54, SD = 0.73$ ) provocation,  $F(1, 76) = 0.052, p =$   
15  $.82, \eta_p^2 = .00$ . Similarly, anxiety did not change from low ( $M = 2.27, SD = 0.88$ ) to high ( $M =$   
16  $2.24, SD = 0.93$ ) provocation,  $F(1, 79) = 0.325, p = .57, \eta_p^2 = .00$ . Thus, in line with previous  
17 studies using the TAP, these measures were reflective of anger during this experimental task  
18 (e.g., Bond & Lader, 1986; Parrott et al., 2003).

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1 Acknowledgements

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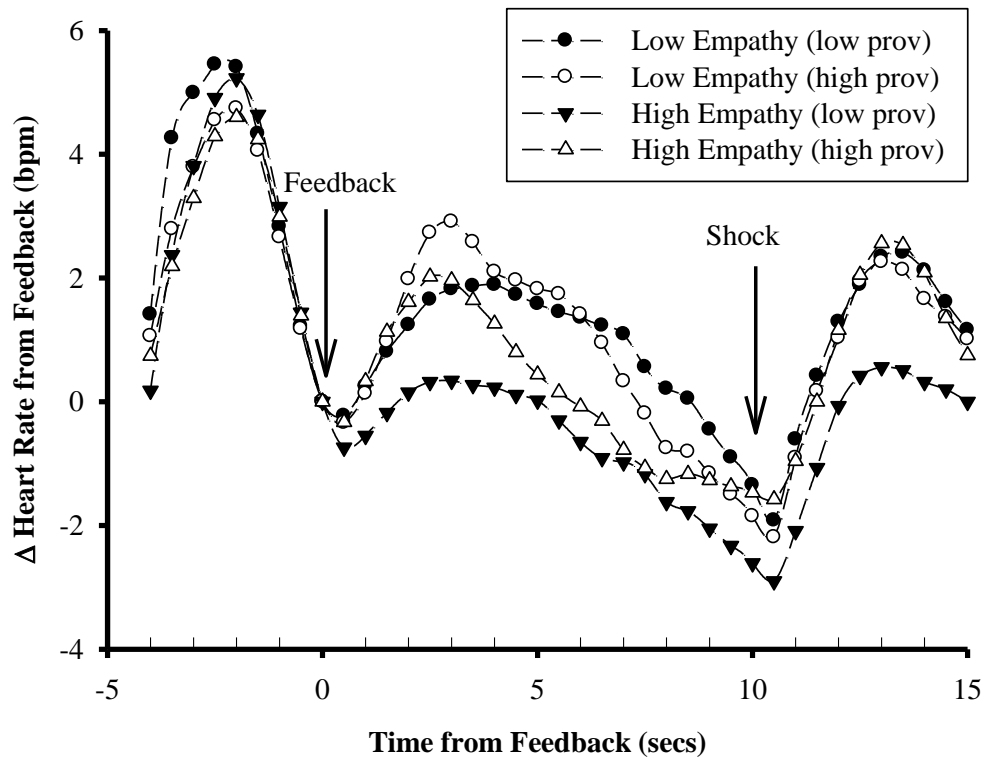
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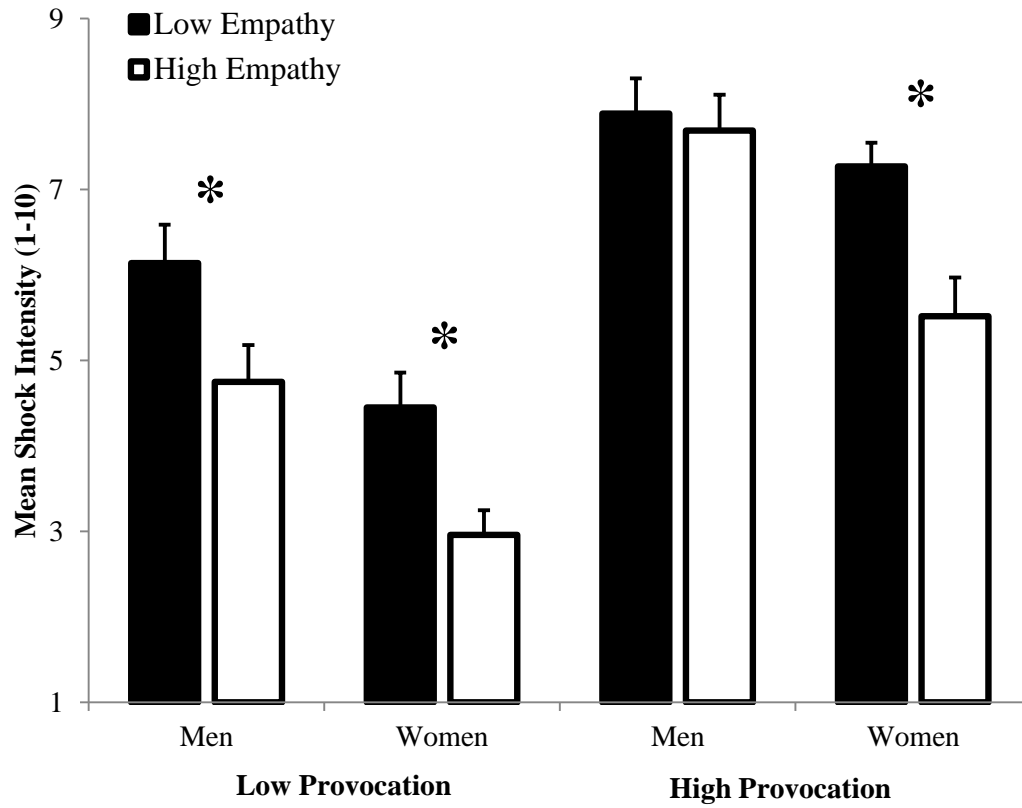
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Figure 1. Heart rate change (bpm) as a function of time from feedback on losing trials for low and high empathy groups during low and high provocation.



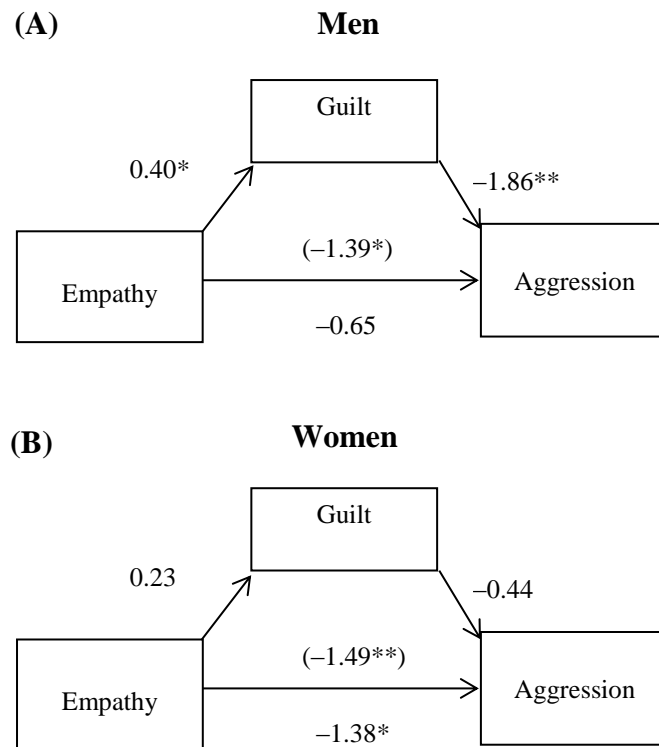
1

2 *Figure 2.* Mean (*SE*) intensity shock selection for men and women in the low and high  
 3 empathy groups during low and high provocation.

4 \*  $p < .05$ .

5





1

2 *Figure 3.* Guilt mediated the effect of empathy on aggression at low provocation in men (A),  
 3 but not in women (B). Unstandardized regression coefficients are presented, and uncorrected  
 4 coefficients are in brackets. Low empathy group was coded 0 and high empathy group was  
 5 coded 1. \*  $p < .05$ ; \*\*  $p < .01$ .

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