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Schedule	Received	5 Aug 2022
	Revised	25 Oct 2022
	Accepted	22 Nov 2022
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Keywords (separated by '-') Formidability - Postconflict reconciliation - Aggression - Coalition

Footnote Information

Evolutionary Psychological Science
https://doi.org/10.1007/s40806-022-00350-z

RESEARCH ARTICLE

Men's Expectations for Postconflict Reconciliation with Physically Strong Opponents

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Received: 5 August 2022 / Revised: 25 October 2022 / Accepted: 22 November 2022
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Abstract

Physical conflict has been historically prevalent throughout human evolution, with physically strong men possessing an advantage. To reduce the likelihood of incurring continued costs of conflict, opponents may engage in postconflict reconciliation to secure valuable social relationships. Two studies considered how formidability of male combatants informs expectations of reconciliatory behavior. In Study 1, participants reported expectations of respect exchanges between combatants, both following wins and losses, who were physically strong and weak. Study 2 tasked men with reporting their expectations for respect exchanges with strong and weak opponents following wins and losses. Strong targets were consistently expected to receive more respect following conflict. Nonetheless, male perceivers intended to display more respect against strong opponents regardless of fight outcome. Men's upper body strength provides an important cue in shaping alliances for men, particularly when the potential costs of continued conflict are salient.

Keywords Formidability · Postconflict reconciliation · Aggression · Coalition

Humans are sensitive to physical features connoting formidability. Acuity toward these features could facilitate identifying those likely to inflict physical harm on perceivers (Neuberg et al., 2011). Estimates of a target's proclivity toward harm should be most apparent toward men, given historic asymmetries in physical aggression that saw men engage in conflict more readily (Sell et al., 2009, 2012). These inferences could function to reduce contact with exploitative conspecifics and prevent harm to perceivers. When physical conflict is unavoidable, individuals could attempt to mitigate further harm through ingratiation. Ingratiation would prove especially advantageous when an opponent is highly formidable.

Formidability inferences occur readily through men's upper body strength. From these inferences, individuals could recognize men's exploitative intentions or potential as a coalitional ally. Such expectations could inform the perceiver on how they navigate reconciliation following a conflict (Barbaro et al., 2018; Brown et al., 2022a; Pham et al., 2017). This research considers how men's upper body strength informs expectations for postconflict reconciliation.

Formidability Inferences and Coalitional Values

Humans have competed over finite resources throughout evolutionary history (Wrangham & Peterson, 1996). In this conflict, researchers have argued for a coevolution of sexual dimorphism in formidability due to men's engagement in intrasexual competition. This would lead men to engage more frequently in physical conflict and consequently becoming physically larger than women, with the most successful men being larger themselves (Lassek & Gaulin, 2009; Sell et al., 2012). This asymmetry appears sexually selected, with selection favoring formidable men (Hill et al., 2017; Puts, 2010). Men's formidability appears central to many social perceptions across various cultures, which leads perceivers to use cue formidability when navigating social interactions with men (e.g., Brown et al., in press, 2021, 2022b, c; Geniole & McCormick, 2013; Lukaszewski et al., 2016; McDonald et al., 2012).

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As formidability became sexually dimorphic in humans, perceptual systems would have evolved acuity toward formidability. Such inferences are multimodal, occurring through auditory (Aung & Puts, 2020) and visual features (Caton et al., in press). Nonetheless, upper body strength appears most reliably diagnostic of men's formidability (Durkee et al., 2018). Accordingly, strong men assume roles in various societies requiring strength (Apicella, 2014; Brown et al., 2022d; Lukaszewski et al., 2016; von Rueden & Van Vugt, 2015). Inferences of men's physical capabilities could provide further estimates of their intentions within groups and how they engage group members, either benevolently or exploitatively (Geniole et al., 2015).

Navigating Postconflict Reconciliation

Physical conflict often ends with reconciliation. Various primates exhibit reconciliatory behaviors following conflict (e.g., touching and grooming), including macaques (Aureli & van Schaik, 1991) and chimpanzees (de Waal & van Roosmalen, 1979). Humans use handshakes and hugs for similar purposes (Benenson & Wrangham, 2016; Spencer, 2014). Such behaviors appear functional in light of the valuable relationship hypothesis (Cords & Aureli, 2000; de Waal & Aureli, 1997). Reconciliation could strengthen bonds between opponents, particularly when the benefits of cooperation outweigh costs of prolonged conflict. Men display greater respect toward victorious opponents than against those whom they have defeated (Barbaro et al., 2018; Pham et al., 2017). There is an additional expectation that men with less formidable facial structures will confer greater respect toward opponents (Brown et al., 2022a). Similar deference could occur as a function of putative cues to upper body strength.

This deference toward strong men could be the result of an implicit theory about such men as being unwilling to reciprocate in this reconciliation. Strong men are perceived as prone to bullying and are generally more aggressive (Brown et al., 2022e; Gallup et al., 2007). Formidable men feel more entitled to contested resources (Haselhuhn et al., 2013; Lukaszewski, 2013; Sell et al., 2012). Such entitlement could undermine their interest in ingratiation, thus shaping expectations of them as disinterested in reconciliation. Despite a lack of reciprocity, it could be less costly to ingratiate with entitled opponents to reduce the likelihood of injury. Awareness of potential costs imposed by opponents could shape expectations of how perceivers behave following conflict.

Current Research

This research considered how upper body strength facilitates expectations of postconflict reconciliation between men. In two online studies conducted through Qualtrics, we tasked participants to indicate their expectations for combatants to display and receive respect from opponents who varied in strength following victories and losses. Study 1 addressed expectations for reconciliation among third-party perceivers. Study 2 tasked men to indicate their expectations as the opponents.

Study 1

Study 1 considered expectations of reconciliation among third-party perceivers toward formidability cues. We predicted that participants would expect more displays of respect toward victorious opponents. However, strong men's physical advantage in conflict led us to predict this expectation would be especially pronounced toward strong opponents (Pham et al., 2017; Sell et al., 2012). Additionally, to reduce the costs of continued conflict, we predicted this deference toward strong opponents would be most apparent for a weak combatant (Brown et al., 2022a).

Given these predictions for displays of respect, we developed predictions for the likelihood of receiving respect. Our first prediction was that the strong target would be expected to receive more respect. We expected that this effect would be amplified when a strong target defeated a strong opponent, which could reflect an understanding of men's interest in coalition-building with formidable allies (Barbaro et al., 2018). Finally, based on previous research suggesting greater deference toward physically disadvantaged opponents when they win (Pham et al., 2017), we predicted that a weak opponent would receive more respect following victory.

Method

Participants

We recruited 181 undergraduates from a large public university in Southeastern USA for course credit (118 women, 63 men; M_{Age}=18.94, SD=1.82; 83.4% White). No data were excluded. A sensitivity analysis indicated that we had adequate power to detect small effects in a 2 × 2 × 2 within-subjects experimental design (Cohen's f=0.08, 1-β=0.80).[1]

Materials and Procedure

Participants were initially presented with a pair of men deemed "targets" that serve as hypothetical protagonists in this study. That is, we instructed participants to consider these targets as reference points for their subsequent judgments. They viewed four specific pairs of combatants in one-on-one fights with two different fight outcomes (i.e.,

[1] We report an exploratory analysis considering Participant Sex as a between-subjects factor in a supplemental analysis in our OSF link.

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Win versus Loss). The other combatant was described as the "opponent." Participants evaluated the expected behavior of targets and opponents following each hypothetical fight.

Each pair was presented separately from each other in a randomized order to reduce demand characteristics. Outcomes of each conflict were further counterbalanced to ensure the same combination of combatants would not be shown in direct succession of each other. Participants indicated the extent to which that they expected each target to display respect toward opponents with one item and to receive respect from the opponents with another item (1=*Not at All Likely*; 10=*Extremely Likely*; Pham et al., 2017). Respect was defined for participants as any behaviors that could demonstrate ingratiation following the conflict (e.g., handshakes and hugs).

The opponent images originated from a stimulus set varying in upper body strength. Strength was determined through a composite of their chest press and handgrip strength from the stimulus set's originators who subsequently chose the strongest and weakest men from their original sample and categorized them as strong and weak, respectively (Lukaszewski et al., 2016). In previous studies using these stimuli, perceivers exhibit above-chance accuracy in perceiving these targets' actual strength (e.g., Brown et al., 2022c), which is a common heuristic to infer men's fighting ability (Sell et al., 2009). Target men were all White and wore standardized white shirts, photographed from the waist-up with neutral expressions. We selected two strong men and two weak men. One was the target; one was the opponent for both target classes. We had four unique combinations with both outcomes (see Fig. 1).

Results

We conducted two 2 (Target Strength: Strong = 1, Weak = −1) × 2 (Opponent Strength: Strong = 1, Weak = −1) × 2 (Target Outcome: Win = 1, Loss = −1) repeated-measures linear-mixed effects models at the trial-level to analyze our data. One model explored expectations of receiving respect and the other model explored expectations of displaying respect.

Receiving Respect

This model revealed a main effect of target strength, wherein the strong target ($M = 5.30$, $SD = 2.12$) was expected to receive more respect than weak target ($M = 5.03$, $SD = 2.44$) ($b = .14$, $SE = .06$, $t = 2.41$, $p = .02$, $\beta = .06$, 95% CI_β [.01, .11]). An opponent strength main effect further indicated that the strong opponent ($M = 5.05$, $SD = 2.32$) was expected to receive less respect than the weak opponent ($M = 5.28$, $SD = 2.24$) ($b = -.11$, $SE = .05$, $t = -2.22$, $p = .03$, $\beta = -.05$, 95% CI_β [−.09, −.01]). A Target Outcome further indicated that the winning target was expected to receive more respect ($M = 5.36$, $SD = 2.31$) than the losing target ($M = 4.97$, $SD = 2.24$) ($b = .19$, $SE = .05$, $t = 3.75$, $p < .001$, $\beta = .09$, 95% CI_β [.04, .13]).

Effects were qualified by a Target Strength × Target Outcome interaction ($b = -.14$, $SE = .05$, $t = -2.75$, $p = .006$, $\beta = -.06$, 95% CI_β [−.11, −.02]) (see Fig. 2). No difference emerged between the winning strong target ($M = 5.36$, $SD = 2.07$) and winning weak target ($M = 5.37$, $SD = 2.52$) ($b = -.01$, $p = .93$). Conversely, among losing targets, the strong target was expected to receive more respect ($M = 5.25$, $SD = 2.16$) than the weak target ($M = 4.70$, $SD = 2.30$) ($b = .28$, $SE = .07$, $t = 3.84$, $p < .001$, $\beta = .12$, 95% CI_β [.06, .19]). No other effects emerged ($ps \geq .18$).

Displaying Respect

An opponent strength main effect indicated that participants expected strong targets ($M = 5.07$, $SD = 2.14$) to display more respect than weak targets ($M = 4.85$, $SD = 2.08$) ($b = .11$, $SE = .04$, $t = 2.703$, $p = .007$, $\beta = .05$, 95% CI_β [.01,

Fig. 1 Example bodies of strong (left) and weak targets used in both studies (masked for privacy in this paper). Full images of targets with faces are provided on OSF

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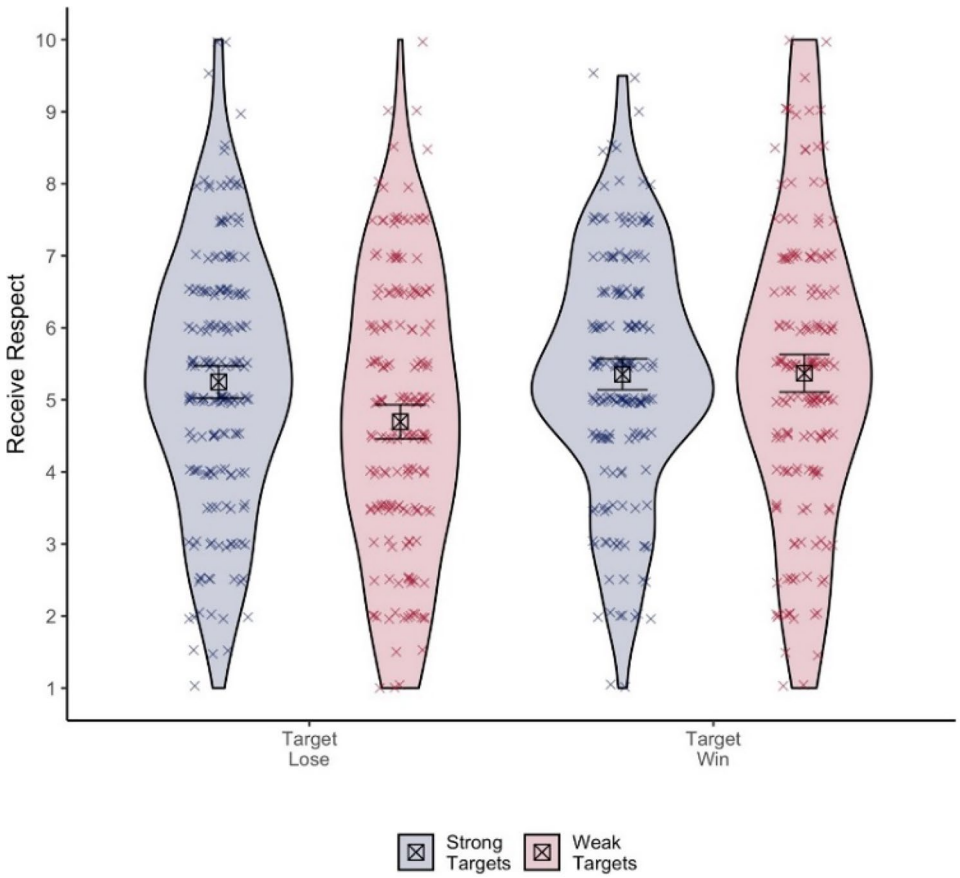

Fig. 2 Expected respect received by strong and weak targets following a win or a loss for Study 1 (error bars reflect 95% CIs). Points reflect participant-level data

.09]). A target outcome main effect additionally indicated that winning targets ($M = 5.08$, $SD = 2.10$) were expected to display more respect than losing targets ($M = 4.84$, $SD = 2.12$) ($b = .12$, $SE = .04$, $t = 3.02$, $p = .003$, $\beta = .06$, 95% CI_{β} [.02, .09]). Data are summarized in Fig. 3. No other effects were significant ($ps \geq .29$).

Discussion

This study provides initial evidence for how formidability influences third-party judgments of reconciliatory behavior. Strong opponents were perceived as more likely to display respect toward the target, which could reflect competing perceptions of strong men as ingratiating alongside their aggression (Brown et al., 2022e). Unlike other formidable features duly that connote anger, the inferred hostility of upper body strength may be less salient through than facial cues (Geniole & McCormick, 2013).

Although participants expected the strong target to receive more respect overall, weak men were perceived as similarly likely to receive respect when victorious. This effect aligns with previous research indicating victorious combatants receive respect, particularly with a physical disadvantage (Pham et al., 2017). The strong target was further expected to receive respect at similar levels across both outcomes, whereas the weak target's received respect was heightened following a victory. This difference could reflect an expectation of strong men's ability to inflict more physical harm that could motivate opponents to mitigate future conflict.

No interactive effects emerged for targets and opponents. This finding could suggest the presence of one formidability sufficiently informed perceptions. A focus on the target could have additionally impeded evaluations of both combatants simultaneously, which would reflect a limitation in perceiving behavioral intentions between multiple third parties. With such a focus, participants could have considered the strong opponent especially antagonistic, which could have resulted in the observed expectation that a strong opponent would receive less respect. This limitation in perceptions led us to consider first-person expectations of combatants in Study 2.

Study 2

Despite providing continued evidence for how formidability cues inform expectations of reconciliation, Study 1 remained limited in considering third-party perceptions. That is, these results may not reflect what perceivers would expect if they were combatants themselves. The signal value of formidable

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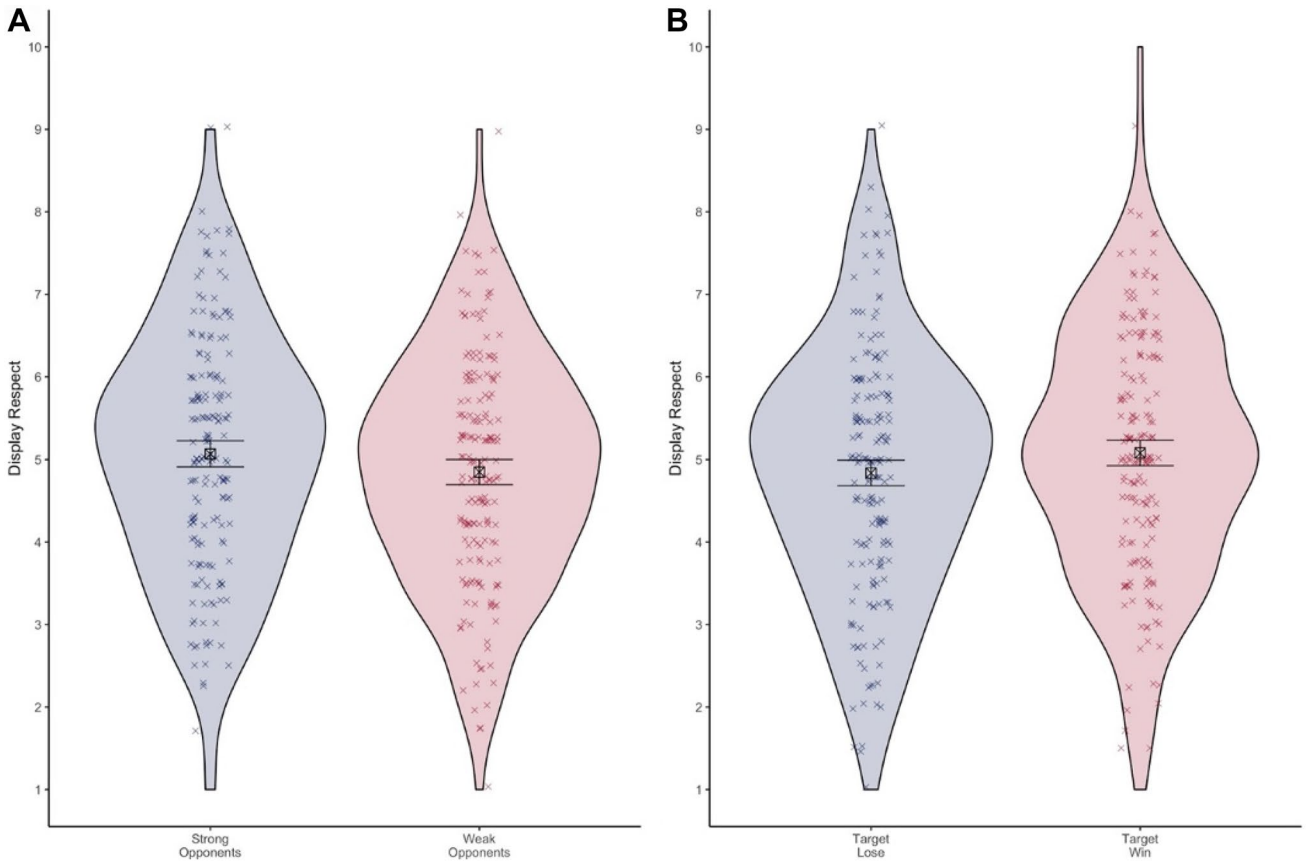

Fig. 3 Expected respect displayed (error bars reflect 95% CIs). **a** depicts the opponent strength effect while **b** depicts the target outcome effect. Points reflect participant-level data

men's potential costs could be more salient to a perceiver rather than another person. With this possibility to mitigate future conflict, we predicted that participants would report greater likelihood to display respect toward strong opponents.

Conversely, given results from Study 1, we predicted that participants would display more respect toward a weak opponent if the participant lost. For receiving respect, we predicted that participants would expect weak opponents to be more deferent toward them in light of findings that suggest men low in formidability are more deferent toward their opponents (Brown et al., 2022a). We expected this effect would be amplified following a loss. Finally, unlike in Study 1, which relied on norming data to ascertain the strength of combatants, Study 2 addressed explicit assessments of targets' upper body strength.

Method

Participants

We recruited a sample of 82 undergraduate men from a large public university in Southeastern U.S. in exchange for course credit (M_{Age}=19.18, SD=1.04; 80.5% White). Our decision to recruit only men in this study was in the service of ecological validity, wherein men are the primary participants in physical conflict and the various selection pressures that afford them physical advantages in these conflict (Puts, 2010; Sell et al., 2012). A sensitivity analysis indicated we were adequately powered to detect small effects in a 2 × 2 within-subjects experiment (Cohen's f=0.15, 1-β=0.80). No data warranted exclusion.

Materials and Procedure

This study employed a similar paradigm to Study 1, albeit from the standpoint of participants serving as the opponents for targets. That is, participants imagined themselves having been in hypothetical conflicts with strong and weak targets, wherein they had won or lost the fight. We employed the full set of target stimuli that systematically varied in strength to have four strong targets and four weak targets (Lukaszewski et al., 2016). Targets were presented separately in a randomized and counterbalanced order for participants to evaluate the situation upon winning and losing to each target.

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Items from Study 1 were modified to reflect self-reported expectations (Brown et al., 2022a). We also assessed perceived strength (1=*Not at All Strong*; 7=*Very Strong*) and fighting ability using single-item measures (1=*Not at All Good*; 7=*Very Good*). Correlations between items were high (*r*s>0.77). We collapsed across items for composite formidability scores.

Results

We conducted three 2 (Target Strength: Strong = 1, Weak = −1) × 2 (Outcome: Win = 1, Loss = −1) repeated-measures LMMs. These models analyzed the data at trial level and included random intercepts for both participants and stimuli, as well as random slopes for the effect of target strength.[2]

Formidability

A Target Strength main effect indicated that participants perceived the strong targets ($M = 4.27$, $SD = 1.23$) as more formidable than weak targets ($M = 2.82$, $SD = 1.34$) ($b = .72$, $SE = .18$, $t = 3.97$, $p = .007$, $\beta = .49$, 95% CI_β [.25, .73]). An Outcome main effect additionally indicated that participants viewed targets as more formidable after a win ($M = 3.64$, $SD = 1.50$) than after a loss ($M = 3.45$, $SD = 1.44$) ($b = .10$, $SE = .02$, $t = 4.23$, $p < .001$, $\beta = .07$, 95% CI_β [.04, .10]).

These effects were subsumed by a Target Strength × Outcome interaction ($b = .06$, $SE = .02$, $t = 2.51$, $p = .01$, $\beta = .04$, 95% CI_β [.01, .07]). In winning outcomes, participants perceived strong targets ($M = 4.42$, $SD = 1.19$) as more formidable than weak targets ($M = 2.86$, $SD = 1.36$) ($b = .78$, $SE = .19$, $t = 4.08$, $p = .006$, $\beta = .52$, 95% CI_β [.27, .77]). At a weaker magnitude, in losing outcomes, participants also saw more formidability in strong ($M = 4.11$, $SD = 1.24$) versus weak ($M = 2.78$, $SD = 1.31$) targets ($b = .66$, $SE = .17$, $t = 3.81$, $p = .008$, $\beta = .46$, 95% CI_β [.22, .70]) (see Fig. 4a).

Receiving Respect

An Outcome main effect indicated that participants expected to receive more respect when they won the fight ($M = 5.52$, $SD = 2.30$) than when they lost the fight ($M = 5.15$, $SD = 2.38$) ($b = .19$, $SE = .04$, $t = 4.39$, $p < .001$, $\beta = .08$, 95% CI_β [.04, .12]). The strength main effect was not significant ($b = .04$, $p = .65$), nor was the 2-way interaction ($b = .06$, $p = .19$). These data are summarized in Fig. 4b.

Displaying Respect

A Target Strength main effect indicated that participants expected strong targets ($M = 5.69$, $SD = 2.31$) to display more respect than weak targets ($M = 5.13$, $SD = 2.49$) ($b = .28$, $SE = .09$, $t = 3.20$, $p = .009$, $\beta = .12$, 95% CI_β [.04, .19]). An Outcome main effect further indicated that participants expected to display more respect after a win ($M = 5.68$, $SD = 2.36$) than after a loss ($M = 5.14$, $SD = 2.44$) ($b = .27$, $SE = .04$, $t = 6.62$, $p < .001$, $\beta = .11$, 95% CI_β [.08, .14]). Data are summarized in Fig. 4c. The interaction was again not significant ($b = -.06$, $p = .18$).

Discussion

Results from Study 2 provide additional evidence for how formidability influence reconciliation expectations when participants were the combatants. Participants expected to display more respect toward strong opponents than weak, an effect that could reflect functional deference to avoid further conflict, regardless of the fight's outcome. Formidability did not influence expectations of receiving respect which could reflect differing signal values of formidability cues considered in previous research. The similarity in expectations across strong and weak targets could be a product of viewing oneself as always expecting more respect from opponents. The difference with previous studies considering these expectations could be rooted in other formidability cues being necessarily intertwined with perceptions of hostility that could be absent in bodily cues (Brown et al., 2022a; Geniole & McCormick, 2015).

Victories against strong opponents additionally fostered perceptions of an opponent as stronger. This effect could reflect self-enhancement (Lynch & vanDellen, 2020). That is, defeating a formidable opponent could bolster beliefs about one's abilities (von Hippel & Trivers, 2011). Success following a challenge could lead individuals to believe their success was more impressive compared to success in a less challenging scenario (Hepper et al., 2010).

General Discussion

These findings present some unexpected nuance. Participants expected more ingratiation from strong men as third-party perceivers despite also expecting them to display less respect when they were combatants themselves. This discrepancy could highlight changes in the salience of costs and benefits of formidable men when one becomes implicated in conflict. The benefits of strong men could be more salient, given their attractiveness and sociable personalities, to third-party perceivers (Lukaszewski et al., 2016; Rodriguez & Lukaszewski, 2021).

[2] When conducting a two-way ANOVA with fixedeffects, our results did not meaningfully differ from models that use randomeffects.

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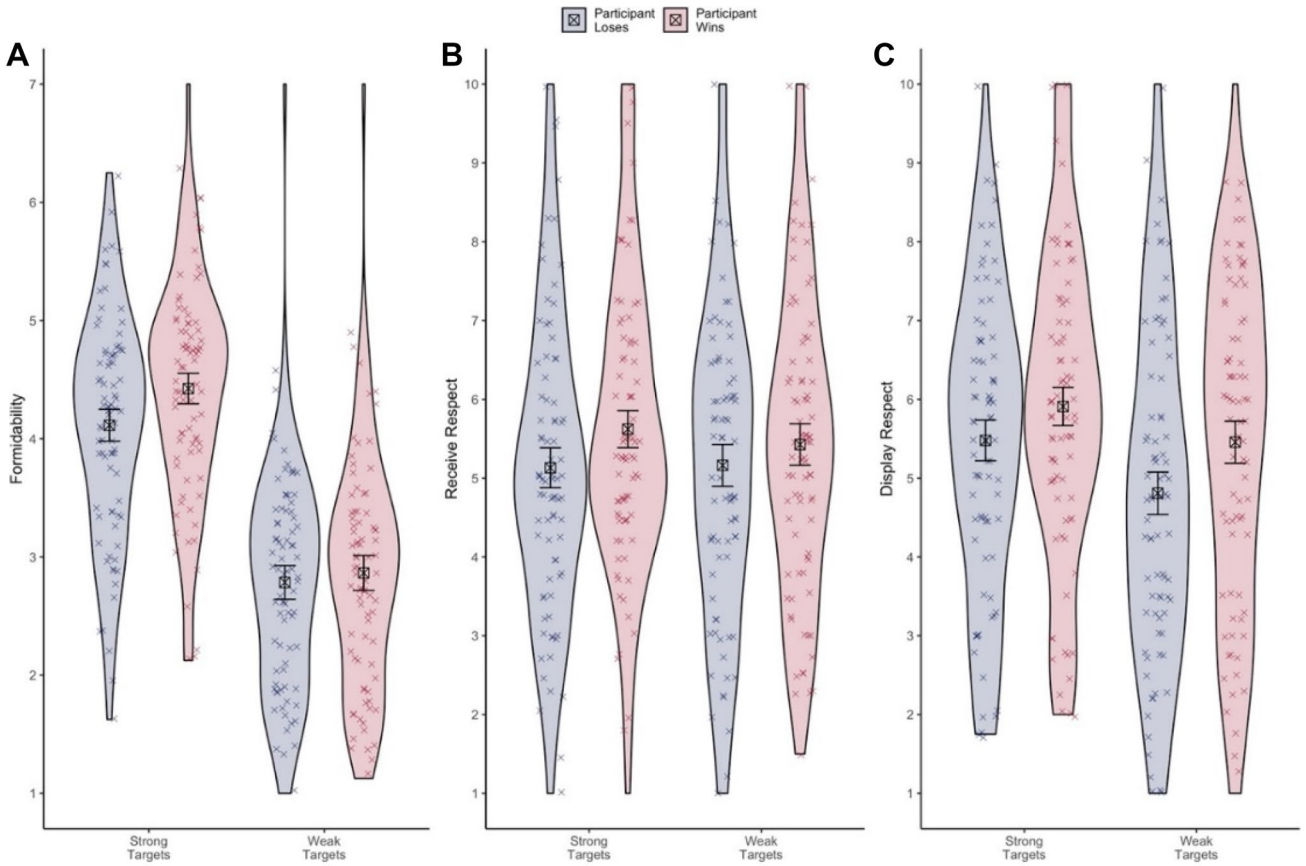

Fig. 4 Results for formidability perceptions (**a**), expectations of receiving respect (**b**), and displaying respect (**c**) from Study 2. Error bars reflect 95% CIs; individual points represent participant-level data

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Nonetheless, these perceptions appeared limited to third-party perceivers. One potential reason for this discrepancy was that third-party perceivers are necessarily removed from having to consider the potential costs of a formidable interaction partner toward themselves. This difference in perspective-taking could leave individuals prone to recognize different social affordances relevant to reduce the risk of exploitation (see Haselton & Buss, 2000). Strong men are aggressive, and a perceiver could expect to incur more damage from their aggression (Brown et al., 2022e). Considering oneself as the opponent of strong men could result in perceivers having to consider their own navigation with formidability. The difference could reflect an interest in mitigating physical costs while attempting to identify others' aggression preemptively.

In addition to these effects rooted in formidability, we replicated additional work related to the expectations of reconciliation based on fight outcomes. Participants expected more respect following wins from opponents independent of target formidability (see Brown et al., 2022a). These findings are unsurprising, given a general interest in conferring respect on winners as part of combat etiquette (Pham et al., 2017). Interest in conferring respect following victory could reflect the proclivity to act prosocially following success, which may be coupled with a belief of oneself as a more gracious winner than the average person (Aknin et al., 2018; Alicke & Govorun, 2005).

Limitations and Future Directions

Several limitations emerged in this research that warrant future research. First, these judgments center around expectations from the perceiver about specific behaviors without much consideration for the potential underpinnings of a target. Future research would benefit from addressing the basis of social targets' intentions that could inform perceivers' expectations (Neuberg et al., 2020). For example, formidable men exhibit greater entitlement over shares of contested resources and are more likely to employ aggressive interpersonal strategies (Gallup et al., 2007; Sell et al., 2012). Intentions could be particularly salient to individuals with heightened sensitivity to exploitation. Studies could assess activation of self-protection motives in shaping judgments of men's intentions (e.g., Brown et al., 2017; Sacco et al., 2017).

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The perceived salience of costs in Study 2 from a first-person perspective could position future research to determine an emotional impetus for expectations. For example, inferences of the costs of formidable men are most salient when men are expected to be angry (Krems et al., 2022). A study could present targets with information about their emotional states following conflict, given the covarying anger inferences with formidable features (e.g., Brown et al., 2021, 2022d; Durkee & Ayers, 2021; Geniole et al., 2013). Inferred anger could interfere with identifying potential benefits by making the costs more salient (see Lassetter et al., 2021).

One notable limitation of our current methods is their reliance on hypothetical conflicts with social targets. Although such methodological considerations afforded greater experimental control, they may not reflect the relatively complicated environment of an actual physical conflict. Future research would benefit from specifically considering reconciliation following actual conflicts (e.g., Barbaro et al., 2018; Pham et al., 2017). For example, participants could engage in a physical task against formidable men (e.g., arm wrestling), with researchers identifying the extent to which such men would foster deference (e.g., Cohen et al., 1996). For example, researcher could identify whether participants initiate handshakes following a physical contest with opponents. This more salient approach to physical conflict could additionally lead research to assess the strength of perceivers, given the fact that physically stronger men report greater vigilance toward interpersonal threats that may afford an opportunity to identify an overlap between hypothetical and actual conflict (Richardson et al., 2021).

The focus on men's behaviors in the current manuscript presents an opportunity to consider the factors influencing women's reconciliation (Benenson & Wrangham, 2016). The differences in selection pressures that fostered a sex asymmetry in physical conflict could suggest that visual information about women's prowess may be less relevant (Palmer-Hague et al., 2018; Puts, 2010). Instead of physical conflict, research with women could consider relational aggression that could be assessed through visual cues (Palmer-Hague & Geniole, 2022; Vaillancourt & Krems, 2018).

Conclusion

Postconflict reconciliation may serve to reduce the likelihood of greater costs through physical conflict. The current research provides additional evidence for how information about upper body strength affords perceivers the opportunity to determine men's intentions to ingratiate following conflict. We demonstrate a consistent expectation of deference toward formidable opponents.

Author Contribution MB conceived this research and wrote the initial draft. RET performed primary analyses. NRP programmed and implemented the studies and provided critical writing edits. All authors consented to publication.

Data Availability Data are available at https://osf.io/x3qwr/?view_only=b92900cff39141808431732a1a26ad67.

Declarations

Ethics Approval and Consent to Participate This research had IRB approval. Participants provided informed consent.

Conflict of Interest The authors declare no competing interests.

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