Empirical Article

Preliminary evidence for neck musculature in shaping functional stereotypes of men's relationship motives

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Neck musculature is reliably diagnostic of men's formidability and central to several inferences of their physical prowess. These inferences facilitate stereotypes of men's social value from which perceivers estimate their abilities to satisfy reproductive goals related to mate acquisition and parental care. Participants evaluated men's interest in various mating and parenting strategies, wherein men varied in the size of visible neck musculature through trapezii and sternocleidomastoids for perceivers to identify potential reproductive interests and goals. Large trapezii elicited perceptions of men as more effective at protecting offspring, albeit at the expense of nurturance and interest in long-term pair bonds. Results extend previous findings implicating formidability as central to relationship decisions by considering a novel modality.

Key words: Formidability, stereotyping, mating, parenting, evolutionary psychology.

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INTRODUCTION

Mate selection involves judicious evaluations of another's parental abilities with limited information. From an affordance management perspective (Neuberg, Williams, Sng, *et al*., 2020), human perceptual systems evolved to facilitate the identification of prospective mates capable of satisfying competing reproductive goals (Zebrowitz & Collins, 1997). This perceptual system appears to have evolved to identify physical features implicating targets as having intentions that inform whether perceivers would approach or avoid social targets (Todorov, Loehr & Oosterhof, 2010; Todorov, Olivola, Dotsch & Mende-Siedlecki, 2015). Within this suite of functional stereotypes could be expectations that men have similar reproductive goals to perceivers. Such inferences could occur with limited information (Johnson *et al*., 2012; Todorov, Pakrashi & Oosterhof, 2009). Appearance informs potential stereotypes of mates (Brown, Boykin & Sacco, 2022; Brown, Tracy & Neiswender, 2023; Sng *et al*., 2020; Williams, Sng & Neuberg, 2016). In reproductive contexts, women prioritize men's musculature (Frederick & Haselton, 2007; Sell, Lukaszewski & Townsley, 2017). This interest in musculature could lead women to view neck musculature as important in social perceptions, namely estimates of their ability to succeed in physical conflict. Perceivers could thus develop stereotypes about such men's interests and abilities.

Women's preference for muscularity remains limited to specific contexts. Muscular men appear sexy and gregarious to perceivers but similarly appear aggressive and disinterested in long-term relationships (Brown, Boykin & Sacco 2022; Brown, Tracy & Neiswender, 2023; Frederick & Haselton, 2007; Sacco, Holifield, Drea, Brown & Macchione, 2020). Despite these salient costs to perceivers, such formidability nonetheless connotes several benefits. Given the relative centrality of protective capabilities in determining men's paternal abilities (e.g., Billet, McCall &

Schaller, 2023; Dixson & Brooks, 2013; Kokko, Brooks, Jennions & Morley, 2003), the perceived advantages of strong men as protectors could similarly lead to muscularity being a heuristic for paternal benefits (Brown, Donahoe & Boykin, 2022). Perceivers might weigh the estimated costs and benefits of social targets based on these competing stereotypes. These perceptions could emerge based on an implicit junction to connect these modalities and thus provide a unique basis for resulting stereotypes (e.g., McElvaney, Osman & Mareschal, 2021; Toscano, Schubert & Sell, 2014). One modality that has gained attention recently is neck musculature from which perceivers could recognize men's formidability that informs coalitional preferences. Neck musculature connotes both men's ability to win in physical conflicts and resist damage, implicating it as having import for affordance judgments in reproductive domains (i.e., sexual selection; Caton & Lewis, 2022). This study sought to understand how neck musculature informs functional stereotypes about men's benefits and costs in relationships.

SELECTION AND STEREOTYPES OF MEN'S FORMIDABILITY

Physical conflict throughout men's evolutionary history has led to unique selection pressures favoring formidability. Women partially selected men based on their success in this conflict that would have fostered sexual dimorphism in the form of larger muscle mass (Puts, 2010). Musculature is central to many aspects of men's social value and heuristically diagnostic of their fighting ability (Frederick & Haselton, 2007; Sell, Cosmides, Tooby, Sznycer, Von Rueden & Gurven, 2009). Covariation between these traits corresponds with strong men's advantage in physical competition (Kordsmeyer, Hunt, Puts, Ostner & Penke, 2018). Implicit knowledge of these advantages would thus foster

heuristic associations between formidability and traits that afford a social target their advantages. Perceivers could use these data as the foundation of functional stereotypes of men's reproductive interests and capabilities that inform subsequent affiliative decisions (Brown, Boykin & Sacco, 2022; Brown, Tracy & Neiswender, 2023; Sng et al., 2020).

Neck musculature could be an easily detected intermediary that connects various, albeit somewhat disjointed, cues to physical prowess in men. Much like how upper body strength and facial width are sexually dimorphic features that afford men advantages in conflict (Caton, Pearson & Dixson, 2022; Sell, Hone & Pound, 2012), men have similarly larger neck musculature that affords them success in their own right (Caton & Lewis, 2022; Zheng, Siegmund, Ozyigit & Vasavada, 2013). In addition to the advantages that large neck musculature would afford men in combat, this morphology stabilizes the head in fights and reduces the risk of injury or death (Collins, Fletcher, Fields, et al., 2014; Elliott, Heron, Versteegh, et al., 2021). Selection would have favored perceivers who demonstrated acuity toward the potential advantages and disadvantages of muscular men within group living (Sell et al., 2009), which could have included men with larger neck muscles. This acuity could have led perceivers to form stereotypes about these men's social interests and make affiliative decisions informed by these features (see Brown, Sacco, Barbaro & Drea, 2022; Fessler, Merrell, Holbrook & Ackerman, 2023; Lassetter, Hehman & Neel, 2021; Wilson, Hugenberg & Rule, 2017).

Much like with facial structures, neck musculature could similarly operate along perceptual stereotypes informed by potential kernels of truth in one's appearance. Perceptions of faces operate along dimensions of warmth and dominance (see Oosterhof & Todorov, 2008). These inferences track morphological features that implicate a social target as a threat or opportunity (Todorov & Oh, 2021), oftentimes considering what perceivers expect are the motives and abilities of the target. For example, masculinized facial features regarded as dominant are relatively informative of a social target's testosteronization, whereas inferences of warmth in female faces track the femininity connoting developmentally appropriate levels of estrogen (Smith, Deady, Moore, et al., 2012; Whitehouse, Gilani, Shafait, et al., 2015). The close connection between the facial masculinization regarded as dominant and actual upper body strength suggests that neck musculature tracks these stereotypes with perceivers being aware of the social affordances of social targets (Sacco, Brown & Lustgraaf, 2016).

MOTIVE INFERENCES THROUGH FORMIDABILITY

Much like other physical features diagnostic of men's physical formidability, neck musculature appears to shape interpersonal preferences and perceptions. These evaluations appear based on an implicit understanding of the lay stereotypes of formidability based on the costs and benefits that formidable men could afford group living. Women find larger neck musculature especially desirable in short-term mates (Caton & Lewis, 2022), an inference that could track knowledge of muscular men as exhibiting unrestricted sociosexual behavior typical and implicate them as having consonant mating goals as unrestricted women (Frederick

& Haselton, 2007; Kordsmeyer et al., 2018). Larger neck muscles additionally facilitate perceptions of men as aggressive (Brown, Tracy & Boykin, 2022), a stereotype that corresponds with research indicating that perceivers view muscular men as more interpersonally threatening (e.g., Sacco et al., 2020; Wilson et al., 2017).

Humans prioritize different traits in mates in different contexts. Much of human mating behavior can be attributed to satisfying the goals of short-term (STM) and long-term mating (LTM). Perceivers estimate the likelihood that a prospective mate could facilitate or impede reproductive goals (Buss & Schmitt, 1993; Neuberg et al., 2020). Knowledge of features diagnostic of a social target's interpersonal strategy could foster perceptions of one's preferred mating strategies (Sng et al., 2020). Women prioritize physical attractiveness in STM, a preference downregulated in LTM to identify men capable of biparental investment (Li, Yong, Tov, et al., 2013). Women prefer formidable features in STM, given its connotation of heritable fitness (Brown, Brown & O'Neil, 2022; Frederick & Haselton, 2007; Sell et al., 2017). These features appear diagnostic of promiscuity due to the success that they afford for women's preferences (Brown, Boykin & Sacco, 2022; Kordsmeyer et al., 2018). Nonetheless, muscular men appear disinterested in LTM to perceivers, which could undermine perceptions of their abilities in LTM. Much like with other morphological features connoting formidability, a similar heuristic should emerge for larger necks in connoting men's STM interest and LTM disinterest.

In addition to the cost–benefit analyses people could invoke in mating domains, the downstream consequences of a mating decision could necessitate consideration of how neck musculature could inform perceptions of men's parental domains. Indeed, physical features inform expectations of how men would behave as parents (Brown, Sacco, Boykin, Drea & Macchione, 2021). Such inferences seem to track expectations of men's ability to satisfy the goals of two parental motivational systems in the form of protection and nurturance (Hofer, Buckels, White, Beall & Schaller, 2018). Physically strong men are perceived as effective at protecting offspring (Brown, Donahoe & Boykin, 2022), although perceptions of this ability comes at the expense of stereotypes about their proclivity toward aggression that appear to undermine perceptions of the interpersonal warmth associated with nurturing (Brown, Bauer, Sacco & Capron, 2021). Muscular men evoke expectations of being hostile toward infants (Sacco et al., 2020), a stereotype that corresponds with reported aversion to masculinized features in hostile environments (e.g., Borras-Guevara et al., 2017; cf. Brown, Sacco & Drea, 2022). Additionally, heightened interest in STM corresponds with reduced interest in nurturance (Beall & Schaller, 2019). Lay stereotypes about muscular men's formidability could thus inform expectations of as inefficacy in nurturance. Larger neck musculature could specifically appear to perceivers as a cue to their abilities at protecting their offspring, albeit at the expense of nurturing them.

Current research

What are the social affordance judgments made through evaluations of men based solely on their neck musculature? This

study considered how inferences of formidability track potentially concomitant stereotypes about formidable men's interpersonal proclivities within reproductive domains. We focused on the competing interests of STM and LTM and men's effectiveness in parental domains from which perceivers' reliance on heuristics of formidability would ostensibly inform their expectations of their motives and abilities.

Given the stereotypes of muscular men as promiscuous and the concomitant desirability of such men in short-term contexts (Brown, Boykin & Sacco, 2022; Frederick & Haselton, 2007), we predicted that perceivers would expect more interest in STM from men with larger neck musculature relative to LTM. Within parental care domains, we focused on the potentially inferred tradeoff in terms of protection and nurturance. The widely documented stereotypes of formidable men affording greater protection in parental domains led us to predict that participants would view large musculature as connoting more effectiveness in protection, particularly at the expense of stereotypes about their nurturing abilities (Brown, Donahoe & Boykin, 2022). In accordance with best practices in open science, we report all manipulations, measures, and exclusions. Data for this study, in addition to the relevant syntax are available: https://osf.io/7by9t/?view_only=34ac8e223f4c4483abf8a27cee280484

METHOD

Participants

A sample of 305 undergraduates participated for course credit from a large public university in Southeastern US (215 women, 90 men; M_{Age} = 19.21, SD_{Age} = 2.81; 83% White). A sensitivity analysis indicated adequate power to detect small effects in a 2 × 2 × 2 within-subjects design (Cohen's f = 0.06, 1 − β = 0.80). No data were excluded. Discrepancies in degrees of freedom reflect missing data.

Materials and procedures

Target stimuli. Participants evaluated four computer-generated portraits of men. These targets originated from a single publicly available photorealistic image that was orthogonally manipulated by its originator in photo editing software (Caton & Lewis, 2022; Fig. 1). Images were
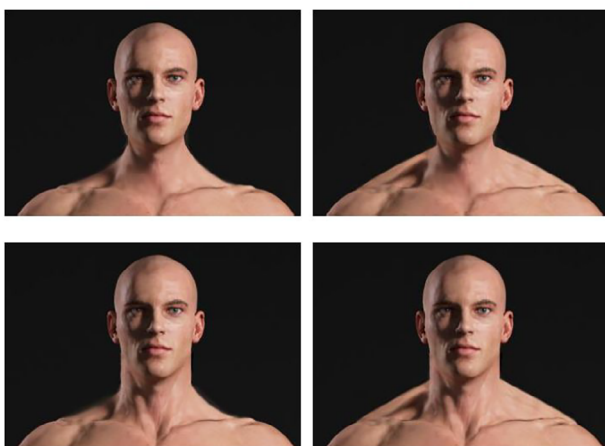

Fig. 1. Target stimuli with small (left column) and large trapezii, with small (top row) and large sternocleidomastoid muscles.

manipulated from a singular image exhibiting a relatively average amount of neck musculature as a base template that saw the stimulus generators increase and decrease the relevant musculature from the template.

Our methodological decision to present a singular target identity was rooted in an interest in standardizing as many physical features as possible to eliminate the influence of facial structures that could covary with neck size (e.g., fWHR) that could ambiguate the signal value of the target stimulus. The lack of intent inferred through static morphology through bodily cues further attenuated concerns of stimulus effects that are apparent for facial structures (Oosterhof & Todorov, 2008). Images varied in size of the trapezius muscles and sternocleidomastoids (SCM). These two muscles are most visible through face-to-face contact that are additionally central to absorbing physical damage (Bauer, Thomas, Cauraugh, Kaminski & Hass, 2001; Broglio, Schnebel, Sosnoff, *et al.*, 2010). Consideration of these muscles was to identify which muscle could be more informative in affordance judgments on an exploratory basis.

Participants viewed targets in random order to prevent order effects while being prompted by a set of instructions that explicitly indicated that they would be evaluating various people. This prompt indicated neither what the manipulation was nor how many trials they would have to perform. Such instructions would ostensibly prevent participants from inferring the goal of this study in light of an already limited influence of demand characteristics in shaping social perceptions in a within-subjects paradigm, given the relative difficulty that participants face in guessing hypotheses when informed about potential differences in stimuli by experimenters (e.g., Grove, Rubenstein & Terrell, 2020; Lampinen, Neuschatz & Payne, 1999; Yzerbyt, Schadron, Leyens & Rocher, 1994).

Affordance judgments. Participants evaluated the targets for as long as they needed before advancing to the next trial. They responded to five separate dimensions that were each operationalized by a single item. First, they indicated the extent they perceived each target as a good fighter with single-item measures. Targets were further assessed by the extent they appeared interested in LTM and STM (Brown, Keefer, Sacco & Brown, 2022). Finally, participants indicated the extent to which targets appeared effective at protecting and nurturing offspring (Brown, Donahoe & Boykin, 2022), two empirically notable dimensions of the parental care system (see Schaller, 2018). Each item operated on the same scale (1 = *Not at All*; 7 = *Very Much*).

RESULTS

Fighting ability

We conducted a 2 (Trapezius: Small vs. Large) × 2 (SCM: Small vs. Large) repeated-measures ANOVA to assess perceptions of formidability. Two main effects emerged. Participants viewed large-trapezius targets as better fighters (M = 5.97, SD = 1.12) than small-trapezius targets (M = 5.77, SD = 1.13), $F(1, 293)$ = 21.89, $p < 0.001$, η_p^2 = 0.07. A similar perceived advantage emerged for large-SCM targets (M = 5.97, SD = 1.09) than small-SCM targets (M = 5.77, SD = 1.15), $F(1, 293)$ = 21.99, $p < 0.001$, η_p^2 = 0.07. The interaction was not significant, $F(1, 293)$ = 0.51, p = 0.47, η_p^2 = 0.002. Table 1 provides relevant descriptive statistics for each outcome variable at each level of the experimental manipulation.

Primary analyses

We conducted two 2 (Trapezius: Small vs. Large) × 2 (SCM: Small vs. Large) × 2 (Motive: STM vs. LTM/Nurturance vs. Protection) repeated-measures ANOVAs. The complexity of these models could ambiguate the meaning of main effects, given that main effect-level differences were not predicted. The ambiguity of

Table 1. *Mean scores (with standard deviations) for each outcome variable at small and large sizes for trapezius and sternocleidomastoid (SCM) muscles*

	Small trapezius		Large trapezius	
Outcome	Small SCM	Large SCM	Small SCM	Large SCM
Fighting ability	5.64 (1.15)	5.88 (1.10)	5.87 (1.14)	6.05 (1.08)
STM interest	4.67 (1.41)	4.72 (1.40)	4.64 (1.48)	4.91 (1.49)
LTM interest	4.11 (1.27)	4.14 (1.31)	3.94 (1.31)	3.99 (1.36)
Nurturance	4.37 (1.14)	4.40 (1.18)	4.27 (1.24)	4.28 (1.21)
Protection	5.66 (1.15)	5.79 (1.12)	5.75 (1.20)	5.89 (1.16)

Notes: Model summaries for each analysis are available through the OSF link.
STM = Short-Term Mating; LTM = Long-Term Mating; Nurturance = Effectiveness in nurturing offspring; Protection = Effectiveness in protecting offspring.

such main effects could further inflate the risk of Type I Error. This led me to report interactive effects exclusively with simple effects tests when a significant interaction emerged at the omnibus level. My analyses further sought to reduce the potential influence of a single stimulus trial in a within-subjects study on Type I Error by exclusively reporting decompositions of interactive effects below $\alpha < 0.005$.

Mating interest. A Trapezius × Mating Context interaction emerged, $F(1, 293) = 8.93$, $p = 0.003$, $\eta_p^2 = 0.030$ (see Fig. 2). Participants did not differ in perceptions of large-trapezius targets' in STM ($M = 4.77$, $SD = 1.48$) from small-trapezius targets ($M = 4.69$, $SD = 1.40$), $F(1, 293) = 2.80$, $p = 0.095$, $\eta_p^2 = 0.009$. Conversely, participants viewed small-trapezius
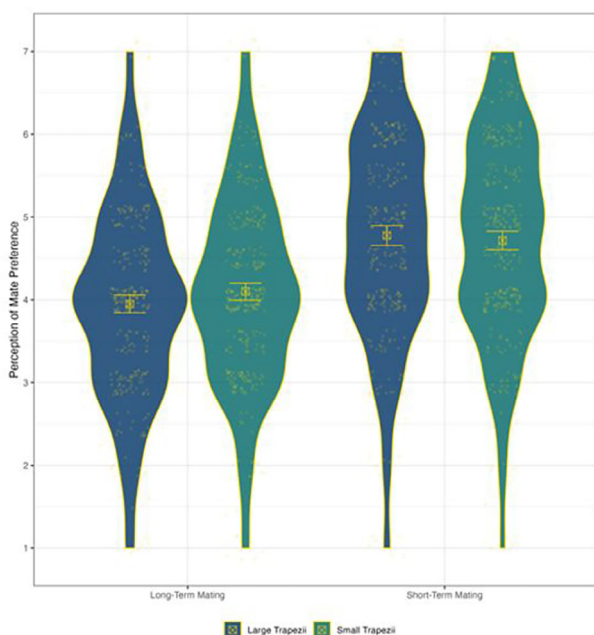

Fig. 2. Perceptions of preferred mating strategies in short-term and long-term domains among large-trapezius and small-trapezius targets. Small points reflect individual participants' responses while large points reflect the overall condition means. Error bars reflect 95% CIs of the means.

targets as more interested in LTM ($M = 4.12$, $SD = 1.29$) compared to large-trapezius targets ($M = 3.96$, $SD = 1.33$), $F(1, 293) = 12.60$, $p < 0.001$, $\eta_p^2 = 0.041$. Viewed another way, both the large-trapezius and small-trapezius targets appeared more interested in STM to participants compared to LTM, $Fs > 27.84$, $ps < 0.001$. The effect for large-trapezius targets was magnitudinally larger ($\eta_p^2 = 0.148$) than for small-trapezius targets ($\eta_p^2 = 0.087$). No other interactions emerged at the adjusted alpha level, prompting no further consideration ($ps > 0.025$).

Parenting ability. A Trapezius × Parenting Motive interaction emerged, $F(1, 288) = 12.55$, $p < 0.001$, $\eta_p^2 = 0.042$ (see Fig. 3). Participants viewed small-trapezius targets as more effective at nurturance ($M = 4.38$, $SD = 1.16$) than large-trapezius targets ($M = 4.27$, $SD = 1.12$), $F(1, 288) = 5.97$, $p = 0.015$, $\eta_p^2 = 0.020$. Large-trapezius targets elicited perceptions of themselves as more effective at protection ($M = 5.82$, $SD = 1.18$) than small-trapezius targets ($M = 5.72$, $SD = 1.13$), $F(1, 288) = 5.12$, $p = 0.024$, $\eta_p^2 = 0.017$. Viewed another way, participants viewed both the large-trapezius and small-trapezius targets as more effective at protection than nurturance, $Fs > 368.48$, $ps < 0.001$. The effect for large-trapezius targets was magnitudinally larger ($\eta_p^2 = 0.602$) than for small-trapezius targets ($\eta_p^2 = 0.561$). No other interactions emerged, prompting no further consideration ($ps > 0.105$).

Perceptual underpinnings. Our next step was to identify whether perceptions of fighting abilities informed these affordance judgments. Given the fact that significant differences emerged with these particular outcome variables, we calculated averages of the perceived LTM interest of targets in addition to their effectiveness in protection and nurturance across both large and small trapezius categories. We calculated difference scores for these categories, with higher values reflecting an advantage for large-trapezius targets in the given domain, which became the basis for a commonplace correlational analysis for fully within-subjects experimental designs (see Brown, Sacco, Barbaro & Drea, 2022; Trafimow, 2015). Perceived fighting ability was associated with neither perceptions of men's LTM interest ($r = -0.06$, $p = 0.25$) nor nurturing ability ($r = -0.07$, $p = 0.21$). However, the perceived fighting advantage of large-trapezius targets was associated with their perceived protection advantage ($r = 0.59$, $p < 0.001$).

DISCUSSION

Results provided nuanced support for hypotheses on the functional stereotyping of neck musculature. Participants expected the social targets to invoke mating and parental tradeoffs based on their neck musculature. For perceived effectiveness in parenting goals, larger trapezius muscles elicited perceptions of men as more effective at offspring protection. This finding aligns with previous work indicating that humans employ a lay heuristic toward formidable features as connoting an advantage in protecting group members (Brown, Donahoe & Boykin, 2022; Brown, Sacco & Drea, 2022; Dixson & Brooks, 2013; Lukaszewski, Simmons, Anderson & Roney, 2016). Given the
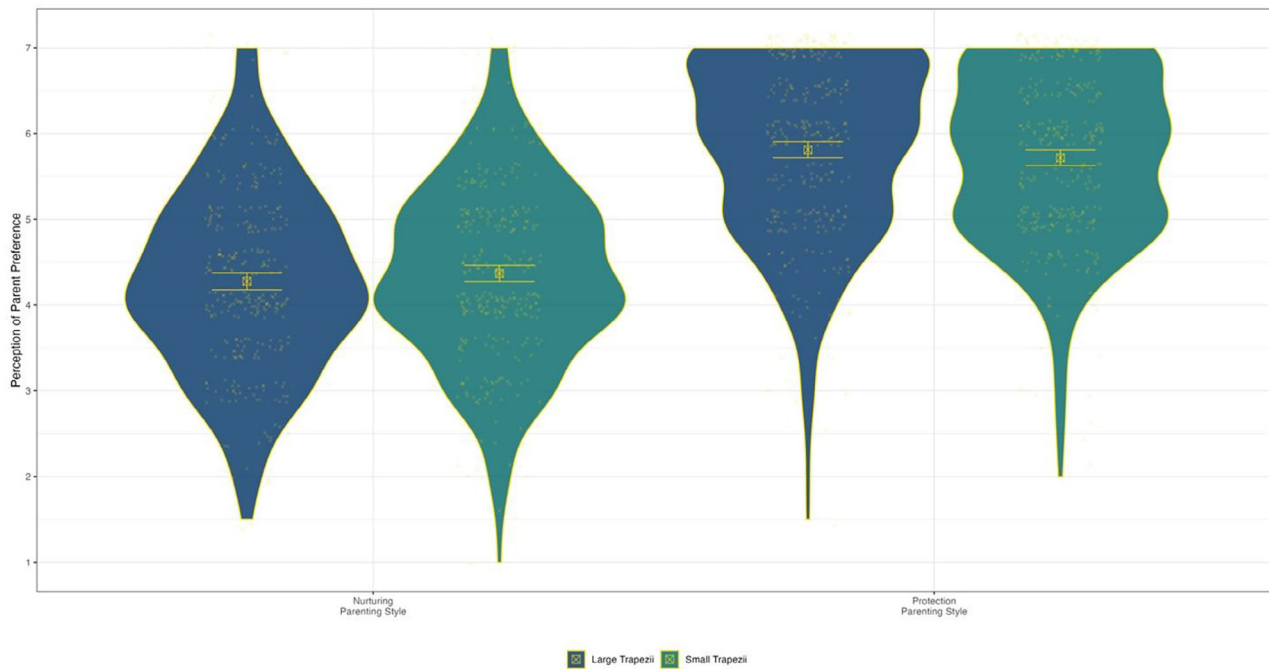
Fig. 3. Perceptions of parental effectiveness in protection and nurturance domains among large-trapezius and small-trapezius targets. Small points reflect individual participants' responses while large points reflect the overall condition means. Error bars reflect 95% CIs of the means.

actual conflict advantage that large trapezii afford men (Caton & Lewis, 2022; Elliott *et al.*, 2021), individuals could develop heuristics about men's parental abilities based on their awareness of what certain features afford while developing stereotypes around it. This was further evidenced by perceptions of fighting ability among men with large trapezii being a partial basis for perceptions of this ability to protect.

Conversely, participants viewed targets with smaller trapezii as affording more opportunities at effective nurturance. This effect could be a consequence of an awareness of men's motivation to nurture offspring occurs at the expense of their motivation to protect, with morphological features serving as the basis of shaping these expectations (Beall & Schaller, 2019). Muscular bodies elicit similar perceptions of men (Sacco *et al.*, 2020). Nonetheless, targets were perceived overall as more effective at protection, an effect that was substantially larger than the comparisons between stimulus categories. This effect could reflect awareness of asymmetries in parental roles that see men's role in protection being more salient with formidable features amplifying an already apparent signal value.

No difference emerged in perceived STM interest across trapezius categories. This could be a consequence of participants already regarding these male targets as more interested in STM overall, with lay perceivers being aware of this proclivity in a given population (see Schmitt, 2003). Nonetheless, large trapezii fostered perceptions of men as disinterested in LTM. The perceived disinterest in LTM tracks previous work demonstrating that perceivers regard muscular men as disinterested in long-term relationships and committed pair bonds (Brown, Boykin & Sacco, 2022). Additionally, the inferred dominance of large musculature undermines men's desirability in LTM, which could inform perceptions of them as preferring promiscuous strategies (Frederick & Haselton, 2007).

Effects for these affordance judgments appeared to be driven by trapezius muscles, with fewer inferences being gleaned from SCM. This distinctiveness could reflect that large trapezii are more salient in face-to-face interactions for the dimensions of height, which aligns with previous work indicating that trapezii are more informative in shaping perceptions of aggression and mating goals (Brown, Tracy & Boykin, 2022; Caton & Lewis, 2022). It could also be the case that the signal value of SCM may be less conducive to aggression compared to other aspects of formidability that may include endurance or physical strength, which perceivers could recognize through the photoreal stimuli to which they could match their expectations.

It should further be noted that these effects remain relatively small. Small effects could reflect a relatively subtle signal value for different relational strategies in men. The various selection pressures that favored aggression and promiscuity in men more broadly could make it challenging to isolate specific variables driving the stereotypes specifically. These subtleties could provide a useful step for future research by encouraging consideration of even more granular measures. Future research would further benefit from identifying the relative salience of explicit costs and benefits of formidable features that could similarly salient, yet orthogonal (see Brown, 2021; Krems & Neuberg, 2022; Lassetter *et al.*, 2021). This relative shift in salience could lead researchers to consider actual group preferences, wherein perceivers must actively weigh the costs and benefits of a conspecific before choosing them for subsequent group membership (Brown, Sacco & Drea, 2022; Tracy, Wilson, Slepian & Young, 2020).

Limitations and future directions

Despite theoretical consonance with previous research, several limitations emerged. First, these findings are based on stereotypes

of men's behavior rather than actual behavior. Future research would benefit from designing studies to assess the potential kernels of truth of these perceptions related to affordance judgments (Jussim, Crawford & Rubinstein, 2015). In such studies to clarify these findings, researchers could assess actual morphology of men's bodies and self-reported motivations (Lukaszewski, Larson, Gildersleeve, Roney & Haselton, 2014). A study could subsequently task participants with evaluating such men with different bodily morphologies and ultimately correlate the self- and other-report scores. A more complete understanding of these perceptions could additionally lead researchers to identify the perceptual underpinnings of these stereotypes, given that formidability as a construct expands beyond fighting ability (e.g., aggression, strength).

The creation of stimuli to assess kernels of truth would similarly address an additional shortcoming of this study. Researchers could determine the extent to which such the perceptions of neck musculature could extend to different stimulus sets. The stimuli in this study benefited from being highly standardized to address issues with previous studies (Caton & Lewis, 2022), it remains less clear whether photoreal stimuli may connote different information to perceivers relative to actual images. Such comparisons would further contribute to a growing conversation on various methodological tradeoffs that researchers invoke to balance the competing needs of experimental control. Photographic stimuli would further allow researchers to consider several target identities through facial features, thus affording researchers to consider cues to intent in addition to the physical prowess inferred through the neck (McElvaney et al., 2021; Toscano et al., 2014).

It would be further advantageous for future studies to identify the potential influence of ecological factors in these inferences. The perceived promiscuity of formidable men could reflect an interest in quicker reproduction in unpredictable ecologies, wherein reproductive conditions may never be as optimal as in a predictable ecology (Griskevicius, Delton, Robertson & Tybur, 2011; Williams, Sng & Neuberg, 2016). Future research could present targets with varying dimensions of neck muscularity in environments that connote varying access to resources or considerable scarcity to identify how ecology influences stereotypes akin to other physical features (e.g., race).

The current study should further be considered from the context of the specific folk language designations for body morphology across cultures. There is certainly a degree of universality with formidability stereotypes, but such stereotypes are nonetheless limited to perceptions of emotional states and physical abilities (Brown, Sacco, Barbaro & Drea, 2022; Durkee & Ayers, 2021). Trait inferences exhibit greater heterogeneity between societies that could potentially influence the perceptions of these physical features across cultures (see Jones et al., 2021). Additionally, the perceived benefits and costs of formidability fluctuate based on sociocultural and ecological factors that heighten the perceived liability or benefit of formidability (e.g., Birkás, Dzhelyova, Lábadi, Bereczkei & Perrett, 2014; Borras-Guevara et al., 2017; Sacco, Lustgraaf, Brown & Young, 2015; Zebrowitz, Wang, Bronstad, et al., 2012).

CONCLUSION

The affordances of neck musculature for physical conflict implicates men with formidable necks as appearing as effective partners in specific domains. Our data indicate this interest in large trapezius muscles is rooted in recognizing the advantage of muscles in protecting, albeit at the expense of providing warmth to one's family. Humans' evaluation of physical features appear function to minimize risks while ensuring their overall safety, which is reflected in functional stereotypes.

Data that support the findings of this study are openly available at: https://osf.io/7by9t/?view_only=34ac8e223f4c4483abf8a27cee280484. Conductance of this study was approved by the University of Arkansas Institutional Review Board. All participants provided informed consent. The author report no conflicts of interest.

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