

Coalitional Value of Formidable Men in Hostile and Desperate Ecologies

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ABSTRACT

Perceivers consider the potential costs and benefits of men based on inferences of their physical formidability. Such inferences could implicate these men as affording coalitional protection, albeit at the risk of intragroup exploitation from formidable men. Whether formidability appears costly could vary across ecological contexts. We tested competing predictions on the signal value of strong men across different ecologies, with a preference for strong men in desperate ecologies representing a bodyguard hypothesis (i.e., benefits exceed the costs) and an aversion to strong men in these ecologies representing exploitation reduction. Participants evaluated the parental and coalitional affordances of strong and weak men described as living in a desperate or hopeful ecology. Consonant with bodyguard hypotheses, strong men further appeared as more effective community leaders in both ecologies, but the effect was larger in desperate ecologies. Strength further tracked perceptions of men's effectiveness as fathers in various domains. We frame these findings in light of how different components of men's formidability offer a unique signal value.

KEYWORDS

Formidability, Ecology, Coalition, Parenting, Status

INTRODUCTION

Despite providing considerable social import in many contexts, the benefits of physically strong men are bounded. Individuals will oftentimes value the potential costs and benefits they afford to group living (e.g., Geniole & McCormick, 2013; Lukaszewski et al., 2016). Protective domains are one context in which the ambivalence toward formidability emerges. For example, although women value formidable men as fathers based on their potential to protect offspring effectively

AUTHOR NOTE: Correspondence concerning this article should be addressed to Mitch Brown, Ph. D., Department of Psychological Science, University of Arkansas, Fayetteville, AR, 72701, United States. Contact: mlb103@uark.edu. Data in this manuscript were presented at the 2023 Northeastern Evolutionary Psychology Society Conference in New Paltz, NY.

EvoS Journal: The Journal of the Evolutionary Studies Consortium

ISSN: 1944-1932 - <http://evostudies.org/evos-journal/about-the-journal/>

2024, NEEPS XVI, pp. 1-13.

(Kokko et al., 2003), such men appear prone to employing harsh disciplinary strategies that could impose their own fitness costs on offspring (Brown et al., in press; 2022a). These competing signal values present a critical decisional process from an affordance management perspective (Neuberg et al., 2020). That is, perceivers must decide whether the benefits of good genes and coalitional protection exceed the costs of potential aggression toward offspring based on environmental factors (Brooks et al., 2011 Borrás-Guevara et al., 2017).

Affiliative preferences for formidable men should be especially critical in environments with particularly salient interpersonal threats. Strong men could offer protection from outgroup threats, prompting a heightened interpersonal preference for formidability in specific contexts (Lukaszewski et al., 2016; Meskelyte & Lyons, 2020). Nonetheless, the projected benefits of formidable allies could dually present the possibility of strong men as likely to exploit people. When considering environmental factors that may shape perceptions of these traits specifically, the degree of perceived hostility could inform perceptions of the costs and benefits of formidability in two distinct ways. On one hand, a hostile environment could create an implicit theory of exploitative behavior among those living in the ecology (Williams et al., 2016). On the other hand, hostile environments could necessitate individuals to choose coalitional allies able to afford protection from threats. Which of these perceptions is more salient within this ecology? This study tests these competing hypotheses for the signal value of formidability in group living across ecologies that vary in their potential hostility.

Coalitional Value of Strength

Given an evolutionary history that rendered upper body strength sexually dimorphic (Sell et al., 2012), selection would have favored acuity toward cues to upper body strength in men. This acuity could facilitate the identification of optimal coalitional allies to address outgroup threats (McDonald et al., 2012), or serve as the basis for heuristics of men's heritable fitness (Puts, 2010). Individuals indeed recognize strength in men's bodies automatically (Durkee et al., 2018), wherein resulting inferences can form the basis of coalitional decisions. Individuals allocate status to physically strong men across various cultures based on the benefits that they afford their social groups (e.g., intergroup representation; Apicella, 2014; Lukaszewski et al., 2016; von Rueden & Van Vugt, 2015). A preference for strong men serves to ensure effective protection from outgroup threats while similarly ensuring that group members adhere to rules that increase inclusive fitness. Embedded in this general preference for formidable men is recognition of their capabilities in protecting mates and offspring (Brown et al., 2022a; Brown & Tracy, in press; Snyder et al., 2011). Mate preferences favoring formidability could reflect inferences of such men as effective bodyguards against outgroup threats.

Despite the coalitional advantages of formidable allies, several costs could emerge in these affiliative decisions. For example, formidable men appear disinterested in monogamy and prone to aggressive behavior that frequently undermines their desirability in long-term romantic contexts (Brown et al., 2022b, 2022c; Frederick & Haselton, 2007). Formidable men are additionally perceived as more prone toward harsh punishment as fathers (Brown et al., in press). Preferences

for such men thus remain limited to contexts in which the benefits of protection against outgroup threats are especially salient (Brown et al., 2022d, 2022e; Hehman et al., 2015). Perceivers may weigh the potential tradeoffs of their affiliative decisions based upon what contextual factors afford the most benefits.

Ecological Stereotypes

Expectations of parental investment and mating goals are often predicated upon consideration of the tradeoffs present to optimize inclusive fitness in an environment. Using a life history theory framework (Kaplan & Gangestad, 2015), organisms vary in the extent they prioritize reproductive or somatic effort based on environmental stability, manifesting on a fast-slow continuum. Prioritization of reproductive goals constitutes a “fast” life history in environments with greater instability (Frankenhuis et al., 2016). Conversely, prioritization of resources to delay reproduction is a “slow” life history (Ellis et al., 2009). Fast life history heightens interest in earlier production of offspring, whereas those with a slow history delay reproduction (Griskevicius et al., 2011).

Various social cues can be used to perceive another’s life history strategy and thus social goals (Sng et al., 2020). An implicit theory for an individual to adopt fast life history strategies is most apparent within desperate ecologies that afford few resources, whereas slow life histories appear more typical within hopeful ecologies that ensure greater access to resources (Williams et al., 2016). The instability of hostile ecologies could evoke perceptions of men as prone to protect their access to resources using violence, leading to women demonstrate an aversion toward formidable men to minimize the likelihood of such exploitation (Allen et al., 2016; Borres-Guevara et al., 2017; Curry et al., 2008). Stereotypes of exploitation heighten aversion toward formidable men when one’s vulnerability is salient (Brown et al., 2017; Cook et al., 2018; Sacco et al., 2020). However, such expectations may not account for the fact that strong men afford protection within hostile environments (Brown et al., 2022d; Snyder et al., 2011). These conflicting findings warrant consideration of how such features afford relevant costs and benefits to perceivers in a hopeful ecology (e.g., Neel & Lassetter, 2019).

Current Study

The competing social affordances from strong men in group living implicate them as providing both social benefits and costs, especially when considering the salience of these cues related to life history. This study tested competing predictions in relation to how formidability connotes costs (e.g., exploitation) and benefits (e.g., protection) in various ecologies. Predictions consonant with a protection hypothesis would indicate that strong men would be seen as beneficial in desperate ecologies (see Meskelyte & Lyons, 2020). Conversely, evidence supporting an exploitation reduction hypothesis would implicate strong men as undesirable in these environments (Allen et al., 2016).

In addition to these predictions in general affiliative domains, we further sought to consider the signal value of strength across ecologies related to parenting. Much like with the previous prediction hypotheses, we predicted strong men would be seen

as more effective at protecting their family in desperate ecologies, whereas evidence for the exploitation reduction hypothesis would implicate strong men as less effective. However, because of the generally inferred aggression of formidability (e.g., Brown et al., 2022a), we predicted that strong men would be perceived as more effective at disciplining their offspring across ecologies. This inference was predicted to coincide with perceptions of strong men as less willing to discuss issues with their children in a disciplinary context. We provide data, materials, and syntax: https://osf.io/y2w85/?view_only=c3f6bba325b140cf8fe9d667e58fb107

METHOD

Participants

We recruited 119 participants from a large public university in Southeastern U.S. for course credit (102 women, 16 men, 1 other; $M_{Age} = 21.41$, $SD = 5.78$; 68.1% White). We had adequate power for small effects using a mixed-model 2×2 design (Cohen's $f = 0.13$, $1 - \beta = 0.80$). Given previous research indicating that formidability inferences manifest similarly for men's coalitional utility across male and female perceivers (e.g., Brown et al., 2022c; Lukaszewski et al., 2016), we did not consider sex differences in this study. No data were excluded.

Materials and Procedure

Ecology. Participants were randomly assigned to evaluate social targets described as living in one of two neighborhoods. Neighborhoods represented either a hopeful ($n = 61$) or desperate ecology ($n = 58$), which were corollaries for slow and fast life histories (Williams et al., 2016). We tasked them to describe the environment for five minutes to increase salience of the environment via a writing task (see Figure 1). Participants then responded to manipulation check items assessing perceptions of the neighborhood as stressful, dangerous, predictable, and stable (1 = *Not at All*; 7 = *Very Much*). After reverse-scoring the latter two items, we created a composite variable for life history speed. Higher scores reflect a faster life history for the given ecology ($\alpha = 0.83$).



Figure 1. Images for the desperate (left) and hopeful ecologies

Social Targets. Following the priming procedure, participants evaluated eight men who were ostensibly fathers living in the previously presented community. Men in these pictures were physically strong or weak, which was previously determined by composite measures of their grip strength and chest press that serve as a reliable proxy for upper body strength (Lukaszewski et al., 2016). Previous research indicates that participants are accurate in identifying these targets' strength across categories, which we continued to assess using a single-item measure assessing perceived target strong (1 = *Not at All Strong*; 7 = *Very Strong*). Images were of eight unique White men photographed from the waist up in standardized white tank tops. We framed their appearance as being standardized to minimize the influence of potential stereotypes of these shirts as “wifebeaters” among low-income communities. Figure 2 provides example bodies.



Figure 2. Example of strong (left) and weak targets

Participants evaluated each target as an effective father using four items that were aggregated into a latent variable representing their paternal ability in the context

of the hypothetical neighborhood ($\alpha > 0.89$). Table 1 provides these items. One single ad hoc item assessed perceptions of targets as effective disciplinarians toward their children in the neighborhood in question, whereas another item assessed perceptions of their willingness to “talk it out” with their children. One additional item assessed how effective the target would be at protecting their family in their respective neighborhood. Finally, another item assessed the extent to which targets appeared to be community leaders (i.e., “pillar of the community”). Items operated on the same scale (1 = *Not at All*; 7 = *Very Much*).

Table 1. Items aggregated to assess paternal ability of targets

Items
This person looks like he can provide basic needs for his family in this neighborhood.
This person looks like he can manage his family well in this environment.
This person looks like he could be seen as someone that values his relationship with his family.
This person looks like he would be interested in working long hours to provide for his family.

RESULTS

Manipulation Checks

An independent samples t-test indicated that the desperate neighborhood connoted a faster life history ($M = 4.38$, $SD = 1.11$) than the hopeful neighborhood ($M = 2.23$, $SD = 0.93$), $t(117) = 11.46$, $p < 0.001$, $d = 2.10$. A paired samples t-test indicated that strong targets also were perceived as stronger ($M = 4.29$, $SD = 0.91$) than weak targets ($M = 2.90$, $SD = 0.91$), $t(118) = 18.56$, $p < 0.001$, $d = 1.70$.

Primary Analyses

We conducted five 2 (Ecology: Hopeful vs. Desperate) \times 2 (Target Strength: Strong vs. Weak) mixed-models ANOVAs with repeated factors over the latter factor. Such an analytic strategy yields similar results with these stimuli as ostensibly more conservative analyses, albeit with greater ease of interpretation (Brown et al., 2023; Fink et al., 2019). Our outcomes were: perceptions of targets as effective fathers, disciplinarians, and as community leaders; perceptions of targets as willing to use more constructive forms of discipline; and perceptions of men as affording safety for their family.

Four Target Strength main effects emerged. Strong targets were perceived as more effective fathers, disciplinarians, and community leaders and more effective at affording safety for their families. No difference emerged for perceived willingness to

use constructive forms of discipline with their children. The Ecology main effects were not significant, nor were the interactions for all outcomes, except for perceptions of the targets as community leaders ($p_s > 0.438$). Table 2 provides relevant statistics.

Table 2. *Perceptions of strong and weak targets*

	Strong	Weak	<i>F</i>	η_p^2
	<i>M (SD)</i>	<i>M (SD)</i>		
Effective Father	4.03 (0.85)	3.42 (0.97)	103.84*	0.470
Disciplinarian	3.82 (1.08)	3.18 (1.10)	71.91*	0.381
Verbal Discipline	3.27 (0.96)	3.24 (1.08)	0.18	0.002
Perceived Safety	4.26 (0.98)	3.22 (1.06)	152.09*	0.565
Community Leader	3.34 (1.01)	2.77 (1.01)	67.85*	0.367

* $p < 0.001$.

An Ecology × Target Strength interaction emerged for perceptions of community leaders, $F(1, 117) = 6.36, p = 0.013, \eta_p^2 = 0.052$ (see Figure 3). Simple effects tests indicated that strong men appeared as better community leaders in hopeful ecologies to perceivers ($M = 3.21, SD = 1.03$) than weak men ($M = 2.80, SD = 1.02$), $F(1, 117) = 16.75, p < 0.001, \eta_p^2 = 0.125$. In desperate ecologies, strong men appeared as better community leaders ($M = 3.48, SD = 0.98$) than weak men ($M = 2.80, SD = 1.02$), although this effect was substantially larger, $F(1, 117) = 56.45, p < 0.001, \eta_p^2 = 0.325$.

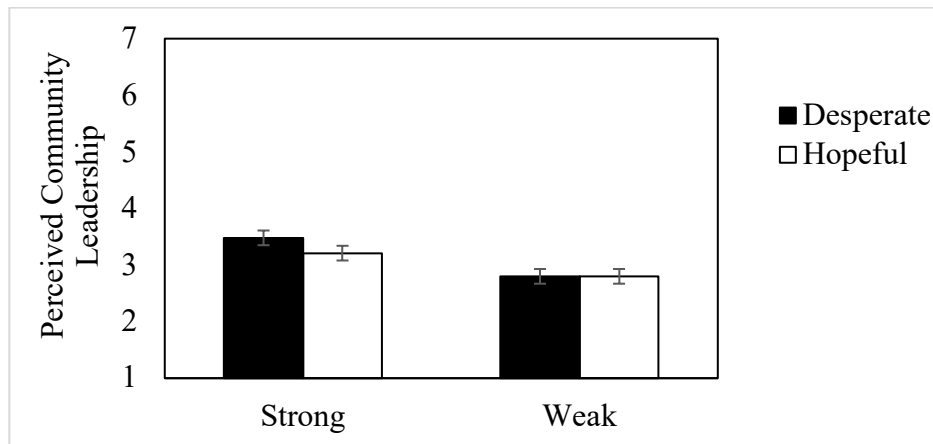


Figure 3. Perceptions of strong and weak men as community leaders in desperate and hopeful ecologies (with standard error bars)

DISCUSSION

Results provide continued evidence for the importance of physical strength for protective purposes. Participants viewed strong men as more effective fathers, safety-providers, disciplinarians, and community leaders in both hopeful and desperate ecologies. Such findings align with previous research demonstrating general favorability toward strong men in identifying effective means of protecting an individual's family from danger (Brown et al., in press; 2022a; Brown & Tracy, in press). With disciplinarian tendencies, strong men could be seen as more effective at ensuring their offspring comply with familial rules for their own safety; this effectiveness could increase strong men's inclusive fitness. That is, strong men could afford protection for their families.

Interestingly, parental effects were invariant across ecologies. These perceptions could reflect particularly high salience of the benefits of strength that may implicate the bodyguard hypothesis to be less context-specific compared to other features connoting formidability (e.g., facial masculinity; Borrás-Guevara et al., 2017). Nonetheless, no difference emerged in strong and weak men's willingness to engage in more constructive discipline with their offspring. This lack of effect could reflect the broader evaluations of effectiveness of men in specific neighborhoods. Participants could have valued the costs and benefits more heavily compared to previous studies that did not provide context (e.g., Brown et al., in press).

Despite the invariance in parenting domains, participants viewed strong men as pillars of the community to a greater degree in desperate ecologies relative to hopeful ecologies. This favorability toward formidability could reflect an understanding of strong men as capable of addressing intergroup threats across ecologies. Nonetheless, the larger magnitude of effect for desperate ecologies could reflect an awareness of the potential hazards that could befall group members when an environment could be hostile (Brown et al., 2022d; Lukaszewski et al., 2016). The

benefits of intergroup threat could have been perceived as greater than the costs of formidable leaders in desperate ecologies, motivating coalitional interest in those capable of addressing threats at the expense of potential intragroup exploitation (Webster et al., 2021). The similar, albeit muted, effect in hopeful ecologies could reflect an impression that formidability may be less imperative when identifying group leaders.

Findings provide a caveat to extant literature investigating the coalitional value of formidability. Whereas masculinized facial features appear especially desirable in relevant domains (e.g., attractiveness, coalitional alliances), perceivers evaluate such features as aggressive, highlighting tradeoffs in formidability judgments (Brown et al., 2022c; Geniole & McCormick, 2013). The hostility inferred through masculinized facial features could be less absent in bodily cues. Nonetheless, strong men appeared more disciplinarian toward their children overall, which could suggest a relative invariance of formidability inferences across ecologies. It should be further noted that the perceived advantages of strong men in these domains could reflect a preference rather than actual interest in these men as coalitional allies.

Limitations and Future Directions

The overall lack of differences across specific ecologies necessitates future research to identify when individuals invoke interpersonal tradeoffs to affiliate with strong men. Studies could explicitly identify fluctuations through assessment of whether strong men afford opportunities or threats (Lassetter et al., 2021). Research could further address functional sex differences in these perceptions, particularly as they relate to different motivational states. First, given the greater acuity that women exhibit toward physical features connoting threats (e.g., Sacco et al., 2015, 2017), future studies could assess individual differences in self-protection motives or temporally activate such concerns before tasking women with evaluating the coalitional value of men. Conversely, given the possibility that formidable men would connote an intrasexual threat for male perceivers (e.g., O'Connor et al., 2012), it could be possible that heightened salience of intrasexual competition could foster greater vigilance toward upper body strength and undermine the perceived coalitional value from men (Mefodeva et al., 2020). Consideration of these potential differences across sexes would further necessitate a larger sample of men compared to the convenience sample in afforded in this study.

Another consideration for future research is the possibility that these effects could have cross-cultural differences. Although many benefits to formidability are salient in other cultures, several costs of formidable features are salient in non-WEIRD cultures. Previous research has indeed demonstrated that women's valuation of masculinized features fluctuate across ecologies, with greater aversion when ecologies experience resource scarcity or heightened instances of domestic violence (Borras-Guevara et al., 2017; Brooks et al., 2011). Conversely, general fear of crime fosters an interest in formidability in the service of increasing one's access to protective opportunities (Snyder et al., 2011). It could also be possible that the trait inferences reported in this study are primarily constrained by Western linguistic conventions that could lead to cross-cultural variability in what the signal value of formidability represents (Durkee & Ayers, 2021). By considering these ecological

factors in comparison to this Western sample, a future study could compare perceptions across cultures that vary in ecological stressors.

It should also be noted that our effects for perceptions of targets' leadership ability were on a relative degree of ability. Participants tolerated strong men. This could reflect a more subtle understanding of the tradeoff, as the costs of strong men could have been apparent orthogonally to the benefits (see Brown et al., 2022f). Participants' inference of coalitional utility could be similarly rooted in a general aversion toward men with less overall value (i.e., weak men) compared to those for whom a tradeoff was more salient (i.e., strong men). That is, this preference for strong men could be rooted in a response similar to "bad genes aversion" hypotheses oftentimes argued as the crux of preferences for cues to heritable fitness (e.g., facial symmetry; Zebrowitz & Rhodes, 2004). Future research would benefit from specifically clarifying the basis of this perceived advantage.

Although the current set of findings exhibited a degree of consistency in assessing the coalitional value of upper body strength, it should be noted that our assessment of their potential leadership ability could remain limited to singular contexts. Our assessment considered strong men as pillars of a community. Although single-item measures are capable of assessing constructs similarly to composite scores (e.g., Allen et al., in press; Bergkvist & Rossiter, 2007), such measures are nonetheless limited in assessing additional aspects of a construct. Future research would benefit from considering other components of leadership or status allocation that are necessarily multidimensional (e.g., Cheng et al., 2013; Lukaszewski et al., 2016).

CONCLUSION

Men's formidability presents social opportunities and costs to perceivers that necessitate consideration for how these evaluations inform affiliative decisions. These findings implicate men's upper body strength as critical to inferences of their coalitional values across ecologies. Our results inform future research to determine the origins of costs and benefits to perceivers.

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