



## Ecologically contingent preferences for formidable coalitional allies as a function of conservative ideologies

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### ABSTRACT

Selecting formidable male coalitions to navigate intergroup threats and resource acquisition evolved to enhance survival through group living, given men's enhanced ability to extract and protect resources through physical aggression. Though advantageous in certain contexts, formidable men can nonetheless inflict intragroup costs, suggesting preferences for this trait varies with resource availability in local ecologies. This study tasked participants (477 women, 140 men;  $M_{Age} = 19.98$ ,  $SD = 4.22$ ) with building coalitions from arrays of physically strong and weak men to acquire resources in hopeful and desperate ecologies before assessing endorsement of several aspects of conservatism. Individuals high in social dominance orientation reported greater aversion to physically strong men in desperate ecologies, although strength was generally preferred independent of ideological differences. Results suggest a tradeoffs framework in coalition-building based on the inferred costs and benefits of physically strong allies.

Group living relies upon identification of those capable of facilitating individual- and group-level goals. Access to, and protection of, critical resources would have historically elicited aggressive behavioral tendencies to win in physical intergroup conflict stemming from resource concerns. This advantage for group living is observed across contemporary and historical human cultures (Wrangham & Peterson, 1996). When selecting members effective for intergroup conflict, formidability becomes valuable. Through selection pressures to outcompete other men intrasexually for access to mates, sexual dimorphism emerged over time, with men being larger and stronger than women (Puts, 2010; Sell et al., 2012). Formidability became a basis of men's social value beyond reproductive contexts in protective domains. Formidable group members have coalitional import for intergroup protection. Formidable men are preferred in coalition-building, particularly among men (Lukaszewski et al., 2016; McDonald et al., 2012), as coalitional formidability increases access to resources and protection.

Although formidability presents various coalitional benefits, these benefits may be especially desirable among those valuing coalitional organization that emphasizes competition and rigid social structures. Rigid structures would favor formidable men capable of winning conflicts who would facilitate implementation of social rules to maintain

their access to these benefits (e.g., Petersen & Laustsen, 2019; Price et al., 2017). For individuals who could benefit from such rules, formidable coalitional allies may facilitate resources acquisition. Within a modern context, individuals likely to benefit from these structures may be more ideologically conservative and prefer coalitions that could increase their access to resources. This study sought to identify how conservatism informs coalitional preferences as a function of resource scarcity.

### 1. Coalitional value of men's formidability

Evolutionary history has seen members of social species frequently engage in conflict over finite resources within their ecology, with considerable documentation of physical conflict between groups in humans and non-human primates (Insko et al., 1992; Wrangham & Peterson, 1996). The coevolution of physical conflict with the sexual dimorphism in formidability has led to conflict becoming sexually asymmetric, as men engage more frequently in physical conflict (Sell et al., 2012). Although the size asymmetry imposed by human sexual dimorphism is not as large as with other primates (Plavcan, 2012), human males nonetheless possess greater muscle mass and cranial robusticity com-

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pared to women in addition to their heightened proclivity for physical aggression and weapon use (Hill et al., 2017; Lassek & Gaulin, 2009). Formidable men possess an adaptive advantage in intrasexual competition that would subsequently connote their heritable fitness to prospective mates (Puts, 2010), though adaptively beneficial beyond direct reproduction as well, such as in facilitating coalitional exploitation.

Formidable men's advantages in physical intergroup conflict are often the basis of coalitional value during intergroup conflict over access to contested resources. The utility of formidable men in conflict would have provided several historical advantages, considering the frequency of physical conflict throughout human history. Ethnographic data indicate that 64% of documented hunter-gatherer societies engage in conflict at least once every two years, possibly driving a social selection of formidability (Bowles, 2009). Despite potential costs of physical harm from formidable conspecifics that could foster an aversion to dominant leaders (von Rueden et al., 2011), benefits could emerge in selecting formidable allies to ensure resource access in competitive environments. Men invoke this tradeoff for access to coalitional resources (McDonald et al., 2012), particularly when motivated by self-protection (Brown et al., 2017; Brown, Sacco, et al., 2021; Van Vugt et al., 2007). Formidable men are preferred in physical conflict (Hehman et al., 2015), deemed as possessing the requisite fortitude for conflict (Brown, Bauer, et al., 2021), and preferred to provide protection (Brown, Donahoe, & Boykin, 2022; Meskelyte & Lyons, 2022; Sacco et al., 2015; Snyder et al., 2011). Men's historically greater engagement in physical conflict suggests this interest in formidable coalitional allies should be most apparent for men.

Despite formidable men's coalitional advantage, they nonetheless pose several interpersonal costs that would make them undesirable in myriad contexts. Formidable men's aggression could implicate them as interpersonally exploitative toward group members and disinterested in social bonds (Brown, 2022; Brown, Boykin, & Sacco, 2022; Frederick & Haselton, 2007; Gallup et al., 2007; Sacco et al., 2020). In fact, women from desperate ecologies, or environments with limited access to resources and increased threats to one's safety, who have been exposed to violence demonstrate aversion toward facial structures typically deemed formidable (Borras-Guevara et al., 2017). Harsh ecologies could lead women to perceive their environment as offering scarce resources, fostering aggressive competition. Archaeological evidence suggests that resource scarcity was a primary basis for physical conflict among ancestral humans (Allen et al., 2016). Given both strong men's physical advantage and general sense of entitlement over contested resources (Sell et al., 2012), desperate ecologies could lead to greater concern among women of formidable men being more likely to fight to secure resources for themselves with women being disadvantaged in conflict. Harsh environments could heighten the salience of these costs. As the size asymmetry leaves women vulnerable to exploitation, this reduced interest should be most apparent for women.

Conversely, women demonstrate enhanced preferences for interpersonal dominance in more hopeful ecologies, or environments with greater access to resources and security (Little et al., 2007). This preference could reflect heightened emphasis on the benefits of formidability over its costs, particularly in terms of increasing benefits for themselves. In environments with greater access to resources, groups or group members could more readily acquire resources through aggressive bargaining, which would create selective advantages for formidable men. The abundance of resources in hopeful ecologies, formidable male allies could afford women increased access to resources without them having to engage others physically themselves because of their disadvantage in intergroup conflict against men.

### 1.1. Ideological coalition-building

Formidable individuals' successful navigation of various physical conflicts could subsequently facilitate their adoption of aggressive in-

terpersonal strategies that continue their access to resources for themselves and group members. Research indicates strong men are more likely to endorse social rules favoring aggressive social bargaining that facilitates their increased access to finite resources, often at the expense of competitors' access (Brown, Chua, & Lukaszewski, 2021; Petersen & Laustsen, 2019; Price et al., 2017; Sell et al., 2017). Affiliating with individuals who appear to endorse aggressive bargaining tactics could increase individuals' access over contested resources, given that they would no longer be competition to these men.

Inferred dominance of formidable men could implicate them as desirable among those with similar interest in rigid social structures. Given that individuals capable of aggressive social bargaining are more likely to prefer competition-driven social policies (Sell et al., 2012), those espousing a conservative ideology could perceive formidable men as instrumental in facilitating their goals in instilling competition-based social hierarchies. Recent findings posit modern conservatism possesses an adaptive function that facilitates the building of strong coalitions to mitigate intergroup threats (Sinn & Hayes, 2018). This preference would thus make it sensible to predict conservatives would find strong men as desirable coalition members to facilitate ingroup access to resources. This formidability preference should further be limited to environments with abundant resources, as the abundance would ensure that formidable men could focus their efforts on protecting the resources for their groups while having their own resource needs satisfied. However, within desperate ecologies that have scarce resources over which ingroup members could aggress (Allen et al., 2016), formidable men's advantage in combat could position them to acquire more resources for themselves rather than on behalf of the group. This would implicate formidable coalition members as undesirable in those environments, particularly among those with more self-interested resource acquisition goals (i.e., conservatives).

### 1.2. Current research

This research sought to extend previous findings identifying formidability advantages in coalition building as a function of ecological scarcity and political ideology. Participants built male coalitions with formidability to acquire group resources in resource-abundant and -scarce ecologies. The benefits of formidability led us to predict participants would prefer formidable coalition members, particularly in hopeful environments. Conversely, given both an aversion to dominance in unpredictable environments (Borras-Guevara et al., 2017) and the fact that resource scarcity heightens physical conflict (Allen et al., 2016), the affiliative costs of formidable men should downregulate interest in formidable coalitions. This downregulation should be more pronounced for women due to physical size asymmetries (Sell et al., 2012).

This study further considered individual differences in conservatism. Because previous work suggests interest in formidable coalition members for various tasks requiring aggressive social bargaining (Lukaszewski et al., 2016), we predicted those espousing a more conservative ideology would be build more formidable coalitions. In addition to the general conceptualization of conservatism through the fiscal and social facets, we tested individual differences related to the specific components of a conservative ideology. Namely, we considered social dominance orientation and system justification, given the focus of these variables on creating and maintaining aggressive competition. No a priori predictions were made for which would be more predictive. Finally, we considered sex differences in coalition-building. Given men's interest in formidable allies for their own coalitional endeavors (McDonald et al., 2012), we predicted men's coalitions would be more formidable overall, particularly among those espousing a conservative ideology in resource-abundant environments. We report all measures, manipulations, and exclusions. Data, syntax, coding instructions for targets, and materials are available online at: [https://osf.io/khs68/?view\\_only=f86952631012497bb252fadadb68ab42](https://osf.io/khs68/?view_only=f86952631012497bb252fadadb68ab42).

## 2. Method

### 2.1. Participants

We recruited 619 undergraduates from a public university in Southeastern U.S. for credit for participation in psychology studies. Two participants were excluded from final analyses for reporting as neither male nor female, given our interest in considering sex differences ( $n = 617$ ; 477 women, 140 men;  $M_{Age} = 19.98$ ,  $SD = 4.22$ ; 58% White). A sensitivity analysis indicated adequate power to detect medium effects (Cohen's  $f = 0.20$ ,  $1-\beta = 0.95$ ). The study received ethical approval for data collection.

### 2.2. Materials and procedure

#### 2.2.1. Targets

Participants chose four prospective coalition members for two separate tasks from an array of eight target individuals (Hehman et al., 2015). Target individuals were college-aged White men differing in physical strength (Lukaszewski et al., 2016). Images originated from a set of photographs, wherein researchers chose the four strongest and four weakest men to create strong and weak categories. Strength was determined through upper body strength, which is accurately inferred through static images (Sell et al., 2009). Targets were neutrally expressive and wore white tank tops in waist-up pictures. Although previous work demonstrated the strong targets were deemed more attractive than the weak, this attractiveness was not the basis of coalitional decision-making, suggesting targets were sufficiently standardized for the current paradigm (Lukaszewski et al., 2016). See Fig. 1 for anonymized example targets.

#### 2.2.2. Environments

Participants were instructed to envision themselves being placed in a team that would gather resources in untamed wilderness in two environments to build a society. Frontiers were described as having limited intervention from humans aside from the participants' group in addition to other groups, a condition we used to leverage concerns of intergroup conflict in desperate ecologies. One environment had easy-to-locate resources described as scarce and requiring constant protection from rival groups, our desperate ecology. The other was described as having difficult-to-locate resources, but abundant when found, our hopeful ecology. Order of presentation was randomized between participants. As participants indicated their choices for both tasks, they had a

description of their environments presented with the targets to ensure they would not forget the conditions in which they were building a coalition. We summed the number of strong and weak targets chosen separately for each environment.

#### 2.2.3. Conservatism

Our interest in identifying which components of a typical conservative ideology predicts strength preferences prompted consideration of multiple measures. We chose measures based on relevance to competitive resource acquisition and favorability toward economic competition that would typify the ancestral roots of what is frequently considered as part of conservatism through folk language conventions (see Sinn & Hayes, 2018). As noted in Table 1, individual differences social dominance orientation and system justification were only modestly correlated with general fiscal and social conservatism, suggesting these specific components were sufficiently distinct from each other for a subsequent analysis using these components as separate measures.

#### 2.2.4. Social dominance orientation

We assessed social dominance orientation (SDO) using SDO-7 (Ho et al., 2015). This 16-item scale assesses the extent individuals desire rigid social hierarchies along dimensions of dominance and anti-egalitarianism ( $\alpha > 0.77$ ), operating along 7-point scales (1 = *Strongly Oppose*; 7 = *Strongly Favor*). Subscales moderately correlated, prompting aggregation ( $r = 0.66$ ,  $p < 0.001$ ;  $M_{Grand} = 2.99$ ,  $SD = 0.96$ ).

#### 2.2.5. System justification

We assessed individual differences in *system justification* (SJ) using a widely used 8-item scale (Kay & Jost, 2003). This scale assesses the extent individuals agree the U.S. is fair (1 = *Strongly Agree*; 9 = *Strongly Disagree*). After appropriate recoding, higher scores reflected perceptions of fairness that could be deemed right-wing and lower scores perceptions of unfairness that could be deemed left-wing ( $M_{Grand} = 4.36$ ,  $SD = 1.39$ ;  $\alpha = 0.79$ ).

Consenting participants chose their teams for both environments before indicating their SDO and SJ. This was followed by demographics, including two items assessing fiscal and social conservatism along separate 7-point scales (1 = *Very Liberal*; 7 = *Very Conservative*). Items highly correlated with each other, leading us to collapse across them items to create one composite of conservatism that indicated a politically moderate sample overall ( $M_{Grand} = 4.11$ ,  $SD = 1.40$ ). Our decision to include this measure was to discern between whether a specific



Fig. 1. Example bodies for physically strong (left) and weak targets for the coalition-building task (identities of targets masked within this paper for privacy).

**Table 1**  
Correlations and between aspects of conservative ideology with grand means (and standard deviations).

	SJ	Fiscal	Social
SDO	0.39 <sup>a</sup>	0.35 <sup>a</sup>	0.35 <sup>a</sup>
SJ		0.45 <sup>a</sup>	0.43 <sup>a</sup>
Fiscal			0.72 <sup>a</sup>

Note. SDO = Social dominance orientation; SJ = System Justification; Fiscal = Fiscal conservatism; Social = Social conservatism.

<sup>a</sup>  $p < 0.001$ .

facet of conservatism was driving effects or if a general identification was more impactful.

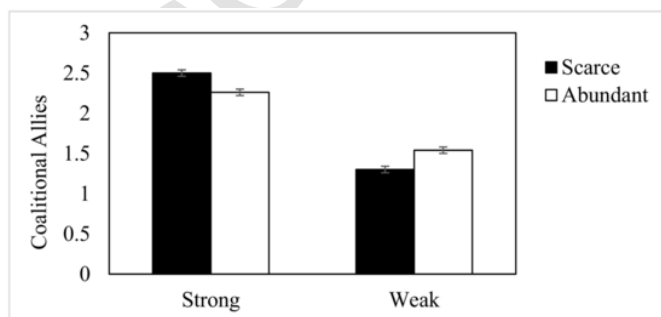
### 3. Results

We conducted a 2 (Participant Sex: Male vs. Female)  $\times$  2 (Resource Access: Scarce vs. Abundant)  $\times$  2 (Target Strength: Strong vs. Weak) mixed-model custom ANCOVA with repeated factors over the latter two factors using conservatism, SDO, and SJ as continuous predictors to identify interactive effects (Brown et al., 2019). Because of the number of predictors in this model, we adjusted our alpha level to  $\alpha = 0.01$  to reduce the likelihood of reporting Type I Errors. We refrain from reporting main effects due to the complexities of these overall models that would render main effects difficult to interpret. Effects were superordinately qualified by a Resource Access  $\times$  Target Strength  $\times$  SDO interaction,  $F(1, 609) = 6.91, p = 0.009, \eta_p^2 = 0.011$ . No other superordinate interactions emerged,  $F_s < 3.47, p_s > 0.062$ .

We decomposed the 3-way interaction by conducting two subordinate ANCOVAs using SDO as a moderator to compare preferences for strong and weak targets, separate for resource-scarce and abundant environments. A subordinate 2-way interaction emerged for scarce environments,  $F(1, 615) = 8.30, p = 0.004, \eta_p^2 = 0.013$ . Bivariate correlations indicated a negative correlation between SDO and preferences of strong targets. Socially dominant individuals chose fewer strong targets,  $r = -0.15, p < 0.001, 95\% \text{ CI} [-0.22, -0.07]$ . No association emerged for weak targets,  $r = 0.05, p = 0.185, 95\% \text{ CI} [-0.03, 0.13]$ . A sign test indicated these correlations were different from each other,  $Z = -3.52, p = 0.004$ . No subordinate interaction emerged for abundant environments, prompting no further consideration,  $F(1, 615) = 2.98, p = 0.085, \eta_p^2 = 0.005$ .

#### 3.1. Subsidiary interaction

In addition to these reported superordinate effects, a 2-way interaction subsumed within the 3-way interaction emerged for Resource Access and Target Strength,  $F(1, 609) = 10.87, p = 0.001, \eta_p^2 = 0.018$  (see Fig. 2). To understand the signal value of physical strength more thoroughly, we decomposed this interaction in an exploratory analysis.



**Fig. 2.** Choices for strong and weak targets in resource-scarce and -abundant environments (with standard error bars).

Simple effects tests indicated participants chose more strong targets in resource-scarce environments ( $M = 2.50, SD = 0.92$ ) than weak targets ( $M = 1.29, SD = 0.81$ ),  $F(1, 609) = 226.10, p < 0.001, \eta_p^2 = 0.271, 95\% \text{ CI} [1.03, 1.34]$ . Participants chose more strong targets in resource-abundant environments ( $M = 2.26, SD = 0.94$ ) than weak targets ( $M = 1.55, SD = 0.87$ ), albeit at a reduced magnitude,  $F(1, 609) = 64.64, p < 0.001, \eta_p^2 = 0.096, 95\% \text{ CI} [0.51, 0.84]$ . Viewed another way, participants chose more strong targets for resource-scarce environments than resource-abundant environments,  $F(1, 609) = 22.62, p < 0.001, \eta_p^2 = 0.036, 95\% \text{ CI} [0.14, 0.35]$ . They further chose more weak targets for resource-abundant environments than resource-scarce environments,  $F(1, 609) = 26.99, p < 0.001, \eta_p^2 = 0.042, 95\% \text{ CI} [-0.36, -0.16]$ .

### 4. Discussion

Findings provided mixed support for hypotheses. Strong targets were unexpectedly aversive in resource-scarce environments among socially dominant perceivers. This aversion could reflect an understanding of increased physical aggression within desperate ecologies that would heighten the salience of strong men's potential threat. Physical conflict would favor formidable men in direct competition, which could impede others' access to resources. Given the interest in competition among socially dominant individuals to satisfy their own salient goals (Sinn & Hayes, 2018), formidable men could present a particularly salient threat to their goal acquisition in an environment with scarce resources that motivate physical aggression (Allen et al., 2016). Nonetheless, the lack of interactive effects in resource-abundant environments could reflect socially dominant individuals actively invoking the tradeoffs inherent in selecting strong male allies. That is, despite the costs of conflict with strong coalition members, an abundance of resources could divert these allies from the perceiver's access to resources to where it would not be as deleterious to the perceiver's resource goals as it would have been in scarce environments.

Contrary to hypotheses, resource-abundant environments did not heighten preferences for strong allies in this study. Rather, resource-scarce environments prompted greater interest in formidable coalitions regardless of conservatism. This preference for formidability could reflect an interest in invoking the tradeoff presented by formidable men to ensure greater access to group resources to improve inclusive fitness. Strong men would be particularly effective at intergroup conflict for contested resources critical to survival (Lukaszewski et al., 2016), though the costs of formidable men (e.g., intragroup exploitation) appeared not to outweigh the perceived benefits. This preference is further bolstered by individuals low in social dominance orientation reporting less aversion to strong allies in harsh ecologies. Given their relative disinterest in hierarchy ascension, the reduced aversion to formidability in harsh environments could reflect an interest in resource access dissimilar to those high in social dominance. For example, low-SDO individuals' preferences could be in the service of ensuring greater access to resources for themselves following the consumption from formidable men.

#### 4.1. Sex similarities in preferences

Interestingly, this aversion toward strong men in desperate ecologies was similar for socially dominant men and women. Women's aversion could have reflected their physical disadvantage due to size asymmetries, a selection pressure that appears to have fostered heightened judiciousness toward potentially exploitative men (Brown et al., 2017; Sacco et al., 2017). Socially dominant women's self-interested psychological calculus could have fostered perceptions of these men's costs as outweighing the benefits in competitive ecologies, an effect that is consonant with recent findings suggesting that men possessing dominant facial features are aversive to women in harsh environments (e.g.,

Borrás-Guevara et al., 2017). These women could perceive such men as unwilling to share resources with them in such environments.

For socially dominant men, affiliating with many formidable allies could undermine their ascension of hierarchies as strong men could be seen as similarly interested in ascent, given formidable men's self-interested pursuits of resources (e.g., Petersen et al., 2013; Sell et al., 2012). Men's coalitional interests could further be contingent upon their own formidability, as formidable men are advantaged in aggressively ascending hierarchies and display greater sensitivity to formidability cues (Richardson et al., 2021). The presence of additional formidable men would both afford the benefit of an effective coalition but also introduces costs of viable rivals, particularly within male-skewed environments that would necessarily increase competition (Kruger, 2010). Future work would benefit in clarifying the bases of men's psychological calculus in coalition-building through considering formidability explicitly, through self-report and actual physical strength (Lukaszewski, 2013). It should nonetheless be noted that these effects could be rooted in the relative asymmetry between men and women in this study. Though sufficiently powered to detect these interactive effects, the absence of interactive effects as a function of Participant Sex could reflect a need for greater parity between men and women. Future investigation would benefit purposefully recruiting larger samples of men.

#### 4.2. Limitations and future directions

The current research provides an initial step in understanding coalition-building yet poses several limitations necessitating future research. First, this study only considered a few facets of conservatism, namely those that could be directly related to status and resource acquisition, with the interest of ascending and imposing a status hierarchy being more predictive than perceptions of the status quo being fair or a generic conservative attitude. It is less clear how facets of conservatism emphasizing societal traditions may specifically shape coalition-building. For example, it has been argued attitudes typifying right wing authoritarianism may have evolved to foster coalition-building for protection against threats and intragroup cohesion, with self-interested mobility underlying social dominance orientation's interpersonal strategies (Sinn & Hayes, 2018). Formidable male coalitions would certainly be instrumental in protecting ingroup and enforcing intragroup rules that individual high in right wing authoritarianism desire (Lukaszewski et al., 2016). Future work would benefit from considering right wing authoritarianism in coalitional interests while also identifying additional contexts that would heighten formidable men's desirability among those with authoritarian personalities.

Though this study provides evidence for specific contexts that favor formidable allies, given the necessity of dominance for intergroup conflict, much of our findings nonetheless suggest formidability remains costly in other domains because of potentially increased likelihood of exploitation. This aversion to dominance may complement an interest in coalitional allies motivated to obtain prestige within the group, wherein conspecifics seek to gain respect from group members (von Rueden et al., 2011). Future research would benefit from determining whether features diagnostic of an interest in prestige would be desirable in coalitional members. A study could identify facial features connoting warmth and trustworthiness, given the reduced likelihood of such individuals to exploit others (Oosterhof & Todorov, 2008).

#### 5. Conclusion

Optimal group living is largely contingent upon the selection of group members most appropriate to address the various challenges of survival and reproduction. For individuals looking to ensure their access to resources through aggressive means, formidable allies may impede these efforts. This study found that a desire to ascend a hierarchy

facilitated aversion to formidability in men when these men could pose a threat for scarce resources.

#### CRediT authorship contribution statement

Mitch Brown was involved in the conceptualization and programming of this study. He further conducted the primary analyses and provided an initial draft of the manuscript with subsequent revisions.

Donald F. Sacco was involved in the conceptualization of this study and provided critical revisions to the manuscript.

Kelsey M. Drea was involved in data collection and provided necessary revisions to the manuscript.

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