



Original Article

The threat premium in economic bargaining

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ABSTRACT

Costly punishment is thought to have evolved because it promotes cooperation and the equitable sharing of resources, but the costs associated with punishment – for both the punisher and the punished – limit the efficiency of this enforcement system in economic interactions. Reputation may also guide decision-making, but this information is not always available (e.g., in interactions involving strangers). Across several bargaining studies, we provide evidence of an efficient and flexible “threat-based” bargaining system that can influence the division of resources without the need for costly punishment and reputational information. We found that participants, without prompting, dynamically adjusted bargaining based on the perceived threat-potential (resource holding power and aggressiveness) of the bargaining partner, giving larger offers to individuals who appeared more threatening. These effects of perceived threat-potential were strongest among participants who were most vulnerable to harm in physical contests (women vs men and weaker men vs stronger men), despite that offers were made on-line and anonymously to photographs of the individuals rather than in face-to-face interactions. These results may reflect an overgeneralization of a real-world threat heuristic that allows low threat individuals to extract resources when possible, while avoiding physical retaliation and harm, and high threat individuals to appropriate larger shares of a resource through static facial cues of threat rather than by physically expressing their propensity to punish. Previously, researchers have highlighted the monetary advantages of attractiveness (the “beauty premium”), but the effects of threat either trumped, devalued, or were equivalent to those of attractiveness.

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1. Introduction

Successful bargaining is critical to long-term collaboration and partnership. In laboratory settings, bargaining often is investigated through the Ultimatum Game (UG) (Güth, Schmittberger, & Schwarze, 1982) in which one individual, the proposer, is asked to share resources with another individual, the responder. If the responder accepts the offer, both players receive their corresponding shares of the resource. If the responder rejects the offer, both players receive nothing. To maximize earnings, proposers should offer the lowest possible amount and responders should accept any offer greater than zero. Contrary to these rational choices, however, proposers generally offer 40–50% of the total sum and responders frequently reject offers of less than 25% of the total sum (reviewed in Camerer & Thaler, 1995; Fehr & Fischbacher, 2003).

Although these results suggest that concerns about equitably sharing a resource trump rationality in the context of economic bargaining, other evidence indicates that people are self-interested and seek to maximize gains, especially when they can do so without incurring costs (reviewed in Wells & Rand, 2013). For example, when the payoffs for each chip in the UG are changed such that each chip is worth 30 cents to proposers but only 10 cents to responders, and proposers are informed of the changes but know responders are not, proposers tend to offer only half of the chips, rather than adjusting the offers to ensure an equal split of the resource (Kagel, Kim, & Moser, 1996). Additionally, when the UG is modified such that responders have no choice but to accept all offers (a task known as the Dictator Game, DG), proposers offer lower amounts to responders to increase their own earnings (Forsythe, Horowitz, Savin, & Sefton, 1994). In diverse populations, a large percentage of offers are slightly less than half of the total (offers of ~40%). Because these offers are usually accepted, they are typically more profitable for the proposer in the long-run than are offers of 50% (see income maximizing offers in Henrich et al., 2006), and may thus represent an attempt to extract as much of the resource as possible while avoiding costly retaliation.

If proposals are driven, in part, by this motivation to extract the most resources possible while avoiding retaliation, then variation in the

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proposer's offers should be reliably and systematically related to characteristics of the responder that are relevant to negotiating power. Whereas reputation and kinship influence bargaining decisions (e.g., MacFarlan & Quinlan, 2008; Nowak, Page, & Sigmund, 2000), this information is not always available (e.g., in interactions involving strangers). We may also rely on other information that can be gained from rapid visual assessment of the individual. One visual characteristic that influences such interactions is attractiveness; attractive individuals receive better wages (Hamermesh & Biddle, 1994), larger tips at restaurants (Parrett, 2015), and larger offers in the UG (Solnick & Schweitzer, 1999; Zaatari, Palestis, & Trivers, 2009) compared with less attractive individuals (for meta-analysis, see Langlois et al., 2000), an economic phenomenon coined the "beauty premium". Attractiveness may be a cue to health (e.g., Boothroyd, Scott, Gray, Coombes, & Pound, 2013; Gray & Boothroyd, 2012) and, in women, to fertility (e.g., Pflüger, Oberzaucher, Katina, Holzleitner, & Grammer, 2012), which may make attractive individuals more desirable as mates or allies (Sell, Tooby, & Cosmides, 2009). As such, beauty premiums may reflect outputs of mechanisms designed to attract high quality allies and mates. Nevertheless, these findings regarding beauty premiums in the UG are not always consistent across studies (null effects in Bhogal, Galbraith, & Manktelow, 2016), and between men and women (Zaatari et al., 2009; see means for men and women in Table 3 of Solnick & Schweitzer, 1999), and some studies find that men make higher offers to other men than they make to women (e.g., Solnick, 2001). Together, these findings suggest that ally and mate attraction mechanisms may not be a strong driver of behaviour in this task, limiting the consistency and strength of the beauty premium across studies.

If variation in UG offers are driven, in part, by the motivation of the proposer to maximize their share of the resource while avoiding costly retaliation, then proposers may instead extract and use information relevant to one's ability and propensity to punish. One such characteristic is the responder's perceived threat-potential – defined here as their resource holding power (e.g., fighting ability, strength, Parker, 1974) and aggressiveness, which can be estimated accurately from brief views of strangers' faces (Carré, McCormick, & Mondloch, 2009; Sell, Cosmides, et al., 2009; Trebicky, Havlíček, Roberts, Little, & Kleisner, 2013; Zilioli et al., 2015). Individuals with greater threat-potential had the upper hand in negotiations throughout history because of their ability to administer more severe punishments in response to treatment that put the threatening individual at a disadvantage. Studies suggest such individuals report being more successful in conflicts, fighting more frequently, preferring more self-favouring economic distributions, and feeling more entitled compared to individuals lower in threat-potential (e.g., Petersen, Sznycer, Sell, Cosmides, & Tooby, 2013; Sell, Tooby, et al., 2009). Further, cognitive systems for revenge, which function to deter exploitation and to upregulate the welfare others place on oneself, are posited to be sensitive to information about one's own and other individual's threat-potential, promoting retaliatory punishment especially when the costs are relatively low (i.e., initiated by an individual of high threat-potential and/or directed towards an individual of low threat-potential, McCullough, Kurzban, & Tabak, 2013). Because of links between threat-potential, entitlement, and likelihood of retaliation, humans may have developed cognitive bargaining adaptations that extract information about one's own and other individual's threat potential, and adjust generosity or selfishness in economic interactions based on this information. Such a threat-based bargaining adaptation would function to improve outcomes for both low threat individuals, who could extract the largest share of a resource as possible while minimizing the likelihood of or damage caused by retaliation, and for high threat individuals, who could advertise rather than physically express (through retaliation) their threat-potential, conserving energy and reducing costs – for both themselves and the target – associated with punishment (e.g., Dreber, Rand, Fudenberg, & Nowak, 2008; Hawley, 1999; Maynard Smith & Harper, 2003; McCullough et al., 2013). Therefore, although attractiveness may influence bargaining in some circumstances,

humans may have developed bargaining adaptations that more consistently and reliably extract and incorporate information about threat-potential.

Based on the hypothesis of a threat-based bargaining adaptation, we derived and tested the theoretical prediction that proposals in the UG would vary as a function of threat, with proposers making larger offers to individuals who appear higher in threat-potential and smaller offers to those who appear lower in threat-potential. Further, threat-based bargaining adaptations may be activated differentially depending on the proposer's own threat-potential (i.e., contingency shifts based on heritable phenotype, Buss, 2009; see also reactive heritability in Tooby & Cosmides, 1990). For example, because individuals of lower threat-potential are more likely to sustain injuries and to report having less success in conflict than are individuals with greater threat-potential (Felson, 1996; Sell, Tooby, et al., 2009), they may experience greater rates of retaliation (McCullough et al., 2013) and be more vulnerable to the harm caused by such retaliation. Therefore, we tested the theoretical prediction that threat-based bargaining adaptations would be most activated among individuals lower in threat-potential (women vs men, weaker men vs stronger men).

The hypothesis of a threat-based bargaining adaptation may be at odds with the idea of a beauty premium. Attractive looking individuals, especially men, tend to be perceived as less threatening (although the magnitude of this attractiveness-threat relationship varies across samples, see Geniole, Keyes, Mondloch, Carré, & McCormick, 2012; Geniole & McCormick, 2013, 2015; Todorov et al., 2013) and thus the influence of attractiveness may be weakened and even reversed (such that attractive individuals get less money) in some bargaining situations. Such a finding would be in opposition to commonly held beliefs and lay intuitions about beauty premiums but nonetheless consistent with theoretical predictions derived from the hypothesis of a threat-based bargaining adaptation (when applied to samples in which these traits are negatively correlated). Therefore, we tested the theoretical prediction that perceived threat-potential would produce stronger and more consistent effects than would attractiveness, especially in samples of men in which attractiveness and perceived threat-potential are more (vs less) inversely correlated.

If threat-based bargaining adaptations do exist, they were likely shaped by highly competitive interactions over high-value and scarce resources, the outcomes of which having important consequences for survival and/or reproduction. One potential problem with conducting bargaining studies in the lab is that participants may not be very motivated to bargain competitively because the social costs of appearing mean or selfish may not be worth the small increase in financial gains (e.g., often a few extra dollars in typical UG studies) associated with proposing low offers. Instead, because it is cheaper to appear generous in low-stakes laboratory experiments compared to real life bargaining interactions over larger, more valuable sums (e.g., the price of a house, one's salary), participants may act overly generous in laboratory interactions. Although earlier studies showed little evidence that the amount of money to be shared influenced generosity of the proposer, emerging research suggests that this amount may indeed be an important factor, with higher initial sums being shared less generously (e.g., in the DG: Amir, Rand, & Kobi Gal, 2012; Bechler, Green, & Myerson, 2015; Novakova & Flegr, 2013; also, for more recent effects of stake size on cooperation, see Yamagishi, Li, Matsumoto, & Kiyonari, 2016).

To promote competitive UG bargaining in the current set of studies, we told participants that only the best bargainer – the individual who made the highest amount during the interactions (which could be achieved by proposing the lowest acceptable amount the responder would accept), would receive a cash prize. Although there might be some drawbacks to this approach (see discussion), we would argue that it likely produces behaviour more indicative of high-stakes, real-world competitive bargaining interactions; the type that we suspect would have been responsible for shaping the hypothesized threat-based bargaining adaptations.

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