The ancestral logic of politics: Upper body strength regulates men’s assertion of self-interest over economic redistribution

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Word count: 2,556
Over human evolutionary history, upper body strength has been a major component of fighting ability. Evolutionary models of animal conflict predict that actors with greater fighting ability will more actively attempt to acquire or defend resources than less formidable contestants. Here, we apply these models to political decision-making about redistribution of income and wealth among modern humans. In studies conducted in Argentina, Denmark and the U.S., men with greater upper body strength more strongly endorsed the self-beneficial position: Among men of lower socioeconomic status (SES), strength predicted increased support for redistribution; among men of higher SES, strength predicted increased opposition to redistribution. As personal upper body strength is irrelevant to payoffs from economic policies in modern mass democracies, the continuing role of strength suggests that modern political decision-making is shaped by an evolved psychology designed for small-scale groups.

Conflict and Upper-Body Strength

Given the ubiquitous presence of aggression among animal species, it is highly probable that our species’ ancestors engaged in aggression for tens of millions of generations, possibly to the origin of the vertebrates. In contrast, the human transition from small-scale conflict to state politics involving millions of players took place with extraordinary abruptness, from 3 to 250 generations ago, depending on the population (Hibbs & Olsson 2004). This means that despite the technological and demographic changes associated with agriculture and the industrial revolution, any evolved decision-making system that navigate political conflicts in modern contexts must have been designed by natural selection to operate in small-scale social ecologies like those our ancestors faced (Petersen 2012).

What effect would these intense, long-enduring selection pressures have had on the subset of decision-making machinery that evolved to regulate conflict? The asymmetric war of attrition
(AWA) is one of the best validated models in behavioral ecology (Hammerstein & Parker 1982; Maynard Smith & Parker 1976), and is supported by scores of empirical studies across all major vertebrate classes (Kelly 2008). Its central premise is that greater fighting ability leads animals to bargain for a disproportionate share of contested resources (Kelly 2008; Huntingford & Turner 1987; Smuts et al. 1987). Lesser fighting ability leads animals to more readily cede resources they cannot cost-effectively defend. It is a fitness error for weaker contestants to attempt to seize resources when they cannot prevail, and for stronger ones to cede what they can cost-effectively defend. Although human social evolution incorporated an unusually strong cooperative dimension (Cosmides & Tooby 1992; Trivers 1971), converging evidence from archaeology (Gat 1999), human evolutionary ecology (Chagnon 1988; Hess et al. 2010; von Rueden, Gurven & Kaplan 2008), and psychology (Archer & Thanzami 2007; Sell, Hone & Pound 2012; Sell, Tooby & Cosmides 2009; Thomsen et al. 2011) indicates that asymmetries in fighting ability were nevertheless a socially relevant variable in ancestral human populations. These asymmetries helped determine the outcomes of conflicts, and hence predicted the payoffs of making alternative decisions. In short, this regime would have selected for neural machinery that assessed relative fighting ability, and used these assessments as inputs to regulate decisions whether to attempt to take resources from others, and reciprocally, about whether to cede one’s own resources to others.

In small-scale societies, a man’s upper body strength was one of several key components of his fighting ability with or without weapons (Sell et al. 2009; von Rueden et al. 2008). Even in developed and well-policed societies where individual violence is rarely used to settle important resource conflicts (Pinker 2011), people nevertheless accurately assess men’s upper body strength from visual and auditory cues, spontaneously base their assessment of others’ fighting ability on upper body strength, and accurately assess their own strength (Archer & Thanzami 2007; Sell 2011, Sell et al. 2009; Sell, Tooby & Cosmides 2009). Consistent with the argument that these abilities
have an evolved basis, 10- to 13-month-old pre-verbal infants make predictions of social outcomes between agents on the basis of relative physical size (Thomsen et al. 2010).

As predicted based on the AWA model, men with greater upper body strength feel more entitled to advantageous outcomes, and have lower thresholds for aggression in conflicts of interest (Archer & Thanzami 2007; Hess et al. 2010; Sell, Tooby & Cosmides 2009; von Rueden et al 2008). In contrast, direct physical aggression was a less rewarding strategy for women ancestrally, both because women had less to gain and more to lose from aggression (Campbell 1999), and because they were at an enduring disadvantage in aggression due to the evolved upper body strength differential between men and women (Lassek & Gaulin 2009). Hence, a person’s upper body strength is predicted to (and was found to) play a role in male but not female decisions involving conflict (Sell, Tooby & Cosmides 2009). In short, previous research supports the claim that among modern humans, a man’s own upper body strength is taken as an input variable to the decision system that regulates how strongly to assert self-interest in conflicts of interest (Sell, Tooby & Cosmides 2009).

**Redistribution as Conflict over Resources**

Whether they focus on rational choice or heuristic processes, standard models of judgment and decision-making assume that somatic variables like upper body strength are irrelevant to the choices people make (Gilovich, Griffin & Kahneman 2002). Correspondingly, in the study of political decision-making, most accounts assume that orientations about modern political conflicts are generated by cultural, historical, or social processes, without input from somatic variables in the self. Yet, if, as hypothesized, individual dispositions about modern political conflicts are partly generated by evolved mechanisms designed for evolutionarily recurrent conditions, then the AWA-model predicts that men with greater upper body strength should be more likely to adopt political
positions that increase their share of resources, while men with lesser upper body strength should be more likely to adopt positions that relinquish resources demanded by others. In contrast to men, the model predicts that this relationship should be weaker or absent among women (Sell, Tooby & Cosmides 2009; see above). To test the association between upper body strength and political positions, we focus on a key resource conflict in modern politics: the redistribution of income and wealth.

 Analyzed without the complications of macroeconomics, income and wealth redistribution is a simple conflict of interest between those whose share of resources would increase (i.e., those who are poorer), and those whose existing share would be reduced (i.e., those who are richer). If redistribution is interpreted by the evolved mechanisms of the mind as a form of resource conflict, then the issue of redistribution should activate the components of human psychology that evolved to handle resource conflicts. If our decision-making adaptations were designed by evolution to regulate the assertion of self-interest on the basis of fighting ability, then the fighting ability of men should predict their positions on redistribution. Specifically, men with greater upper body strength should favor redistribution if they are poor, but oppose it if they are wealthy. This theory predicts the existence of a two-way interaction between males’ SES and their upper body strength on support for redistribution: (1) for males low in SES, physical strength should positively correlate with support for redistribution; (2) for males high in SES, physical strength should negatively correlate with support for redistribution. Women’s upper body strength, in contrast, should have little or no effect on their support for redistribution.

 Rational choice theory is the dominant theory of pursuit of self-interest in the social sciences. In modern society, male upper body strength continues to be correlated with success in interpersonal conflicts (Sell et al. 2009; Sell, Hone & Pound 2012), which is consistent both with the existence of an evolved AWA-based psychology and with rational decision-making that
recognizes that in some individual-level conflicts, personal fighting ability may be instrumentally useful. Importantly, however, when it comes to redistributive policies in modern states, any rational connection between personal upper body strength and payoffs from assertion of self-interest is severed. Here, payoffs are determined by large-scale economic policies enacted by democratically elected representatives and enforced by the state. To the extent upper body strength shapes assertion of self-interest on policies of income redistribution, this would provide clean support for an evolutionarily-based theory of political orientation rather than a rational choice perspective.

Methods
To test these predictions, we collected data on upper body strength, socioeconomic status (SES) and support for redistribution in three countries: Argentina (113 males, 110 females, mean age = 21, s.d.=3.03), United States (211 males and 275 females, mean age = 19, s.d.=3.35), and Denmark (421 males, 372 females, mean age = 48, s.d.=13.91; a nationally representative sample). Fighting ability was operationalized as the circumference of the flexed bicep of the dominant arm—the single best morphological predictor of upper body strength (Sell et al. 2009). SES was measured with questionnaires about social and economic background (see Supplemental Online Materials). To measure support for redistribution, subjects were asked to state their degree of agreement or disagreement with a number of statements about redistribution (see Supplemental Online Materials). All measures were z-scored prior to analysis.

Results
Does upper body strength influence support for redistribution in men? Yes. As predicted, for men of high SES the correlation between strength and support for redistribution is negative, whereas for men of low SES the correlation is positive (see Figure 1). In other words, strong men who are high
in SES oppose redistribution whereas strong men who are low in SES favor redistribution. Using ordinary least squares regression, we regressed subjects’ support for redistribution on their SES, upper body strength, and their interaction for males and females separately. For males, there was a highly significant interaction effect in all three countries (Argentina: $F_{1,98} = 7.83; p = 0.003$, $r^2 = 0.082$; US: $F_{1,201} = 6.22, p = 0.007, r^2 = 0.032$; Denmark: $F_{1,414} = 9.70, p = 0.001, r^2 = 0.124$; one tailed $p$-values). Figure 1 displays the marginal effects of male upper body strength (with associated confidence intervals) on support for redistribution and how that effect changes with different levels of SES. These effects are robust to the inclusion of control variables such as age, political ideology, and physical exercise (see Supplemental Online Materials). It is telling that the effect of strength on support for redistribution remains after controlling for political ideology, which suggests that political ideology can be broken down into different evolved domains that are each regulated by distinct evolutionarily-relevant variables (Hatemi & McDermott 2011; Petersen et al. 2012).

Does upper body strength influence support for redistribution in women? No. Regarding female subjects, nowhere was the interaction of upper body strength and SES on support for redistribution statistically significant (Argentina: $F_{1,87} = 1.38, p = .24$; US: $F_{1,268} = .39, p = .54$; Denmark: $F_{1,366} = 7.13, p = .73$; two-tailed $p$-values). Furthermore, the interaction of upper body strength and SES on support for redistribution was stronger for men than women in all tested countries, and the difference reached significance in both the US and Denmark. This is indicated by a three-way interaction between sex, upper body strength, and SES on support for redistribution (US: $F_{1,268} = .562, p = .009$; Denmark: $F_{1,366} = 3.40, p = .033$; one tailed $p$-values). In Argentina, the three-way interaction was not significant (Argentina: $F_{1,87} = .13, p = .358$; one tailed $p$-value). The effect size of this interaction was comparable in the Argentine and Danish samples ($\beta = .09$ and $\beta = .13$, respectively); however, the Argentine data, less than a third of the sample size of the Danish sample, lacked the statistical power to reach conventional significance levels.
As predicted, physical strength is correlated with support for economic redistribution among low SES males. However, as SES increases above average, the effect of upper body strength on support for redistribution becomes negative; in other words, among higher SES men, physical strength is correlated with opposition to redistribution. Because such policies have the effect of shifting resources from higher to lower SES individuals, the results indicate that physically stronger males (rich and poor) are more prone to bargain in their own self-interest, supporting proposals for redistribution if they are poor and resisting those proposals if they are rich. On the other hand, weaker males (rich and poor) are less likely to contest proposals that run against their own self-interest, showing less support for redistribution if they are poor and less resistance to redistribution if they are rich. As predicted, in all three countries the same statistical pattern was found only among men.

**Discussion**

The asymmetric war of attrition model of animal conflict predicts that animals use advantages in fighting ability to bargain for increased access to resources. Equally, it predicts that attempts to self-interestedly increase resource share should not be initiated when at a competitive disadvantage. The findings reported here show that this model generalizes to humans, successfully predicting the distribution of support for, and opposition to, redistribution in three different nations.

We tested a key prediction derived from animal conflict theory: individuals with greater fighting ability (here, upper body strength) should seek larger shares of contested resources. We showed that upper body strength in modern adult men influences their willingness to bargain in their own self-interest over income and wealth redistribution. These effects were replicated across cultures and, as expected, found only among males. The Danish sample is especially informative in that it is a large and representative national sample.
These findings also offer a solution to one of social science’s key puzzles: Despite the fact that rational choice theory is a dominant theory in social science, many empirical studies have found that self-interest has only small effects on political attitudes (Kumlin 2007). On this basis, critics have argued that political attitudes are divorced from self-interest and are instead derived from abstract political principles (Sears et al. 1980; Sears & Funk 1991). The present findings show, however, that the assertion of interest in mass politics is reliably calibrated by physical strength, a factor relevant to ancestral bargaining in men. It is not that self-interest is irrelevant—rather, our bargaining decision-making systems are simply designed to reflect self-interest in a cost-effective way, assuming evolutionarily recurrent small-scale social conditions.

Although individual differences in upper body strength were ancestrally consequential in conflicts of interest, and continues to be relevant in many interpersonal disputes today, physical strength is objectively irrelevant to the personal payoffs of particular distributional schemes at the national level: National policies on issues like redistribution are determined by anonymous voting, electoral representation and the numerical power of the factions in the legislature. Furthermore, they are enforced by the state rather that by self. Yet our results demonstrate that physically weak males are more reluctant to assert their self-interest—just as if disputes over national policies were a matter of direct physical confrontation among small numbers of individuals, rather than abstract electoral dynamics among millions.

It should be noted that it remains possible that individuals partially recognize the irrelevance of individual fighting ability in the domain of mass social dynamics. It may be that the weighing of physical strength in decision making negatively covaries with the number of individuals involved in a conflict such that strength influences processing about abstract large-scale political conflict less than processing about small-scale interpersonal disputes. Future research that directly compares the influence of fighting ability on parallel decisions in small and large-scale settings
would be able to determine whether increasing the number of individuals involved down regulates the strength effect.

Furthermore, the findings of this study are silent with regards to the precise proximate variables that mediate between upper body strength and psychological traits. One candidate is testosterone, which previous research has linked to both strength (Isodori et al. 2005) and aggression (Archer 2004). If valid, endogenous endocrine release of testosterone would be regulated by mechanisms designed to monitor upper body muscle mass in the self and other. At the same time, it should be noted that the association in men between upper body strength and aggression is unlikely to be just the product of testosterone, as the effects of strength on aggression are substantially greater than the established effect of testosterone on aggression (Archer 2004; Sell, Tooby & Cosmides 2009).

Humans are undeniably complex and unusual animals, and other more traditionally accepted factors certainly play a role in determining how individuals approach mass politics. Nevertheless, modern mass political conflict appears to be another important domain of human behavior in which our decision-making bears the stamp of our hunter-gatherer past.

References


Figure 1. Greater upper body strength in men predicts more self-beneficial positions on redistribution. Figure displays marginal effect size of upper body strength on support for redistribution over changing levels of socio-economic status for three countries (Panel A: Argentina, N=101; Panel B: US, N=204; Panel C: Denmark, N=418). Solid lines are predicted effect sizes and dashed curves are one-tailed 95% confidence intervals of the given effect sizes. Effect sizes are unstandardized regression coefficients based on z-scored variables. Across the three countries, men with low SES become more supportive of redistribution with increasing strength, while men high in SES become less supportive of redistribution with increasing strength.