Bodily Attractiveness and Egalitarianism are Negatively Related in Males

Michael E. Price, Department of Psychology, Brunel University, London, UK. Email: michael.price@brunel.ac.uk (Corresponding author).

Stuart Brown, Department of Psychology, Brunel University, London, UK.

Amber Dukes, Department of Psychology, Brunel University, London, UK.

Jinsheng Kang, School of Engineering and Design, Brunel University, London, UK.

Abstract: Ancestrally, relatively attractive individuals and relatively formidable males may have had reduced incentives to be egalitarian (i.e., to act in accordance with norms promoting social equality). If selection calibrated one's egalitarianism to one's attractiveness/formidability, then such people may exhibit reduced egalitarianism ("observed egalitarianism") and be perceived by others as less egalitarian ("perceived egalitarianism") in modern environments. To investigate, we created 3D body models of 125 participants to use both as a source of anthropometric measurements and as stimuli to obtain ratings of bodily attractiveness and perceived egalitarianism. We also measured observed egalitarianism (via an economic "dictator" game) and indices of political egalitarianism (preference for socialism over capitalism) and "equity sensitivity." Results indicated higher egalitarianism levels in women than in men, and moderate-to-strong negative relationships between (a) attractiveness and observed egalitarianism among men, (b) attractiveness and perceived egalitarianism among both sexes, and (c) formidability and perceived egalitarianism among men. We did not find support for two previously-reported findings: that observed egalitarianism and formidability are negatively related in men, and that wealth and formidability interact to explain variance in male egalitarianism. However, this lack of support may have been due to differences in variable measurement between our study and previous studies.

Keywords: physical attractiveness, egalitarianism, formidability, altruism, socioeconomic status

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Introduction

In human ancestral environments, physically attractive and/or formidable individuals would have had an enhanced ability to benefit and/or harm others, and thus would have had increased bargaining power in social interactions (Lukaszewski, 2013; Sell, Tooby, and Cosmides, 2009). In the case of attractiveness, enhanced bargaining power is related to attractive people being perceived as more valuable social associates (Langlois et al., 2000). Attractiveness is socially desirable presumably because traits perceived as attractive are signals of high genotypic and phenotypic quality; e.g., of health and physical fitness, developmental stability, and (in females) fertility (Grammer, Fink, Møller, and Thornhill, 2003; Roney, 2009; Sugiyama, 2005). Enhanced bargaining power associated with formidability (e.g., strength, muscularity) is rooted in the power both to inflict harm via enhanced fighting ability and to confer benefits via enhanced ability to, for example, offer protection or work effort (Price, Dunn, Hopkins, and Kang, 2012; Sell et al., 2009; Snyder et al., 2011). Note that some traits may serve as cues to both attractiveness and formidability (e.g., traits indicating good health).

The increased bargaining power of attractive/formidable individuals would have made them relatively likely to win social competitions, and to thus benefit from the unequal distributions of status and resources that would have resulted from these competitions. Attractive/formidable individuals would have therefore tended to be advantaged by social norms that promoted inequality, as well as disadvantaged by norms that enforced equality (which would have obliged them to cede status and resources to less attractive/formidable individuals). By the same token, less attractive/formidable individuals would have been more advantaged by pro-equality norms and more disadvantaged by pro-inequality norms.[1]

If relatively attractive/formidable people were disadvantaged ancestrally by egalitarian norms, then selection may have favored psychological mechanisms that calibrated one's "egalitarianism"—that is, one's support for norms promoting equality, and aversion to norms promoting competition and inequality—to one's own attractiveness/formidability. Therefore, relatively attractive/formidable people may exhibit reduced egalitarianism in modern environments (Price, Kang, Dunn, and Hopkins, 2011)—even in modern environments in which the relationship between attractiveness/formidability and social bargaining power is weaker than it probably was ancestrally. For example, although physical strength was likely a relatively important aspect of winning status competitions ancestrally, it is probably less important in this regard in many modern industrialized environments. Nevertheless, we may still reasonably predict a negative strength-egalitarianism relationship in these environments, because egalitarianism may be calibrated more to long-standing ancestral conditions than to recently-arising modern ones. Importantly, because men are much more specialized than women for fighting and other tasks requiring physical strength (e.g., compared to women,

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[1] Note that we are focusing specifically on the preference for equality rather than for any other kind of distributive justice. The organizational behavior literature commonly distinguishes between equality (all group members receiving the same reward, regardless of work contribution) and equity (members receive more if they contributed more) (Greenberg and Colquitt, 2005), but we did not test predictions related to the preference for equity. Although we did utilize a construct called "equity sensitivity," this construct does not measure the kind of equity described above (i.e., greater rewards for higher contributors).

men have about 75% more arm muscle mass and 90% higher upper body strength [Lassek and Gaulin, 2009]), formidability is expected to relate to bargaining power in men much more than in women (Lukaszewski, 2013; Sell et al., 2009). Further, because success in ancestral status/resource competition was probably more important to male fitness than female fitness (Trivers, 1972), men probably had more to gain from calibrating their attitudes about resource distribution not just to their own formidability but to *any* aspect of their intrasexual competitive ability, including their attractiveness. Therefore, the negative attractiveness-egalitarianism relationship is expected to be stronger among men than women.

In accordance with the above expectations, in previous studies, negative formidability-egalitarianism relationships have been found among men only, and negative attractiveness-egalitarianism relationships have been demonstrated more consistently among men than among women. These studies suggest that men with more formidable and attractive upper bodies exhibit reduced egalitarianism (Price et al., 2011) on measures such as social dominance orientation (Pratto, Sidanius, Stallworth, and Malle, 1994) and social value orientation (Van Lange, Otten, De Bruin, and Joireman, 1997), and that stronger men perceive themselves as more entitled to special treatment (Sell et al., 2009). Studies also suggest that men who possess traits that are judged as more attractive by others tend to be less generous in economic games (Sanchez-Pages and Turiegano, 2010; Takahashi, Yamagishi, Tanida, Kiyonari, and Kanazawa, 2006; Zaatari and Trivers, 2007). Among women, some studies suggest that egalitarianism is negatively related to self-assessed attractiveness (Price et al., 2011; Sell et al., 2009), but unrelated to attractiveness as assessed anthropometrically or by other people (Price et al., 2011; Takahashi et al., 2006). One study (Holtzman, Augustine and Senne, 2011) reports that among both sexes, bodily/facial bilateral symmetry (an index of attractiveness and biological quality) relates negatively to prosocial personality traits, including some related to egalitarianism (e.g., fairness, empathy).[2]

The relatively less reliable evidence for an attractiveness-egalitarianism relationship in women may suggest, as noted, that women are less likely than men to base their egalitarianism on their own intrasexual competitive ability. Ancestral women may have instead used egalitarianism more to solve other kinds of adaptive problems, including problems related to motherhood and social-network building that require empathy as a solution (Baron-Cohen, 2008). The greater utility of egalitarianism in these contexts for women may help explain why, in many social situations, women tend to score higher than men on measures of egalitarianism and empathy (Croson and Gneezy, 2009; Inness, Desmarais, and Day, 2004).

Hypotheses. We investigated whether attractiveness and formidability were related to sharing behavior in an economic "dictator" game, to scores on an "equity sensitivity" index, and to political egalitarianism (i.e., preference for a relatively redistributive political

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[2] Note also that "cooperativeness" has multiple meanings, and that attractive people may be higher in some forms of cooperativeness. For example, in a study involving a trust game, in which players cooperated by trusting other players to be generous with them, men and women who were higher in other-assessed attractiveness, and whose attractiveness could be viewed by other players, were more trusting (Smith et al., 2009). The study's authors suggest that this increased trust may be rational in the sense that attractive people do generally receive more generous treatment in economic games.

system). Based on the above theoretical considerations, we predicted that lower egalitarianism on these measures would be associated with higher formidability among men and higher attractiveness among both sexes (but especially among men), and that women would score higher than men in overall egalitarianism. We also predicted that relatively formidable men and relatively attractive people would not only score lower on egalitarianism, but would also be perceived by raters as being relatively low in egalitarianism; negative relationships between attractiveness/formidability and perceived egalitarianism would imply that in the social experience of raters, people who are more attractive/formidable tend to behave in a less egalitarian manner. Finally, we attempted to find support for two other previous findings about wealth and egalitarianism: that socioeconomic status and egalitarianism (or related forms of prosociality) are negatively correlated (Kunovich and Slomczynski, 2007; Piff, Kraus, Côté, Cheng, and Keltner, 2010; Piff, Stancato, Côté, Mendoza-Denton, and Keltner, 2012; Ritzman and Tomaskovic-Devey, 1992), and that egalitarianism (and specifically, support for economic redistribution) correlates negatively with strength among higher-income men, and positively with strength among lower-income men (Petersen, Sznycer, Sell, Cosmides, and Tooby, 2013).

Materials and Methods

Participants

Participants (63 men, 62 women, M_{age} = 21.63, SD = 4.87) were mostly British University students who participated in exchange for participation pool credit, a copy of their 3D body scan, and dictator game proceeds. The study was approved by the Research Ethics Committee of the Brunel University School of Social Sciences.

Anthropometric measures of attractiveness and formidability

We used an NX-12 3D body scanner ([TC]², 2010) to measure anthropometric predictors of bodily attractiveness and formidability. This scanner uses white-light to model the body in 3D; it has a point accuracy of < 1 mm and circumferential accuracy of < 3 mm ([TC]², 2010). Our body-scanning procedure was similar to Price et al. (2011, 2012). Before being scanned, participants changed into standardized, scanner-appropriate clothing (briefs and, for women, a sports bra as well); while being scanned, they stood erect in a standardized pose, without flexing muscles, with arms straightened and held slightly away from the sides of the body. Two scans were obtained from each participant, from which measurements were extracted by the NX12 software; this software is programmed to take a wide variety of bodily measurements, and users select which specific measurements (e.g., hips at widest circumference) they wish to record. Each trait's two measurements were used to assess repeatabilities, before being averaged. Repeatabilities (intraclass correlation coefficients) ranged from .96 to .998.

For women, there were two anthropometric attractiveness predictors. The first was waist-to-hip ratio (narrowest circumference between the lower rib cage and upper pelvis, divided by widest hip circumference). The second was body size relative to height, assessed as volume-height index (body volume excluding the head in liters, divided by squared height from chin to the bottom of the feet in meters [Fan, Liu, Wu, and Dai, 2004; Price, Pound, Dunn, Hopkins, and Kang, 2013]; this measure is similar to body mass

index). Measures of waist-to-hip ratio and body size relative to height are regarded by many attractiveness researchers to be important predictors of female bodily attractiveness (Fan et al., 2004; Furnham, Swami, and Shaw, 2006; Price et al., 2013; Singh, 1993, 2002; Tovée, Maisey, Emery, and Cornelissen, 1999; Tovée, Reinhardt, Emery, and Cornelissen, 1998). For men, the anthropometric attractiveness predictor was waist-to-chest ratio (narrowest circumference between the lower rib cage and upper pelvis, divided by widest chest circumference). Several studies suggest that measures of torso "v-shapedness," in particular waist-to-chest ratio, are excellent predictors of male bodily attractiveness (Coy, Green and Price, 2014; Fan, Dai, Liu, and Wu, 2005; Horvath, 1979; Maisey, Vale, Cornelissen, and Tovée, 1999; Price et al., 2013; Swami and Tovée, 2005; Swami et al., 2007). Our anthropometric measure of male formidability was upper body size: the summed male z-scores of mean bicep circumference, horizontal shoulder circumference, and chest circumference, with all circumferences measured at the widest point (this same method of measuring upper body size was used in Price et al. [2011, 2012]).

All of our anthropometric variables were intended, on theoretical bases, to be in some way sex-specific: waist-to-hip ratio and volume-height index were intended as measures of female attractiveness, waist-to-chest ratio was intended as a measure of male attractiveness, and upper body size was expected to be a more relevant predictor for men than for women. However, because most of the bodily traits involved in these variables were measured in the same way for men and women, most of these variables could be analyzed among either men or women. The exceptions were variables involving chest circumference (waist-to-chest ratio and upper body size), as there is no female equivalent to the male chest measurement that would be similarly meaningful theoretically (i.e., female chest [bust] size could not be construed as a measure of muscularity). Therefore, female waist-to-chest ratio measurements were not included in the below analyses, and female upper body size measurements omitted chest circumference and were based only on summed z-scores of mean bicep circumference and horizontal shoulder circumference.
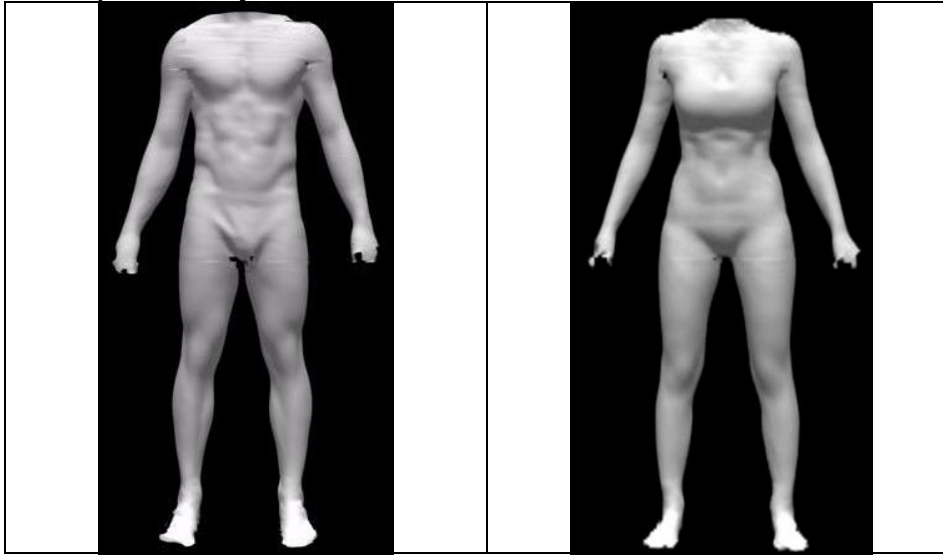
Grip strength

We measured grip strength—a useful indicator of general upper body strength (Sell et al., 2010)—using a digital hand dynamometer (Saehan Corporation: Yangdeok-Dong, Korea). Participants were told to squeeze the dynamometer as hard as they could with their favored hand. Two readings of grip strength per participant were recorded and averaged; repeatabilities were high (intraclass correlation coefficient = .90).

Rated attractiveness

A video of participant 3D body scans was created so that they could be rated for attractiveness. Using Geomagic software, body model heads were removed and their skin was colored grey to remove information unrelated to bodily shape. Using 3DS Max and Windows Movie Maker software, two videos were created for each sex; each video presented models in a different random order to control for order effects. Videos displayed all models of each sex for eight seconds each, rotating in 360 degrees so that overall body shape could be evaluated (see Figure 1 for sample video frames). Models were rated by 10 opposite-sex raters on a scale of 1 ("Unattractive") to 7 ("Attractive"); inter-rater agreement was high (Cronbach's α: .88 for male raters, .91 for female raters). The attractiveness rating instructions are presented in Appendix A.

Figure 1. Examples of body model stimuli

Note. Raters viewed a video of body models rotating 360 degrees. Depicted here are the male model that received the lowest Rated Egalitarianism score and second-highest Rated Attractiveness score, and the female model that received the second-lowest Rated Egalitarianism score and second-highest Rated Attractiveness score

Wealth

We measured wealth by taking the mean response to three items (Cronbach's α = .82) focusing on self-perceived personal wealth, family wealth, and expected future wealth (like Piff et al. [2010, 2012], we focused on self-perceived socioeconomic status, although we did not use the same measure that they used). Participants were asked to "fill in the blank as it applies to you" to the items "I am wealthier than ____% of other people in my society," "my family is wealthier than ____% of other people in my society," and "I expect that I will eventually become wealthier than ____% of other people in my society."

Observed egalitarianism

We measured observed egalitarianism in three ways. First was the amount contributed in a dictator game—a standard experimental economic task (Engel, 2011). Participants reported how much of a £5.00 endowment they would give to another player (from 0 to £5.00, in increments of £0.50) if they were in the role of offerer. They were then randomly assigned (by coin toss) to the role of either offerer or receiver. If they became the offerer, their allocation decision was enacted. If they became the receiver, then they received the amount shared by a randomly-selected prior offerer in the study. Dictator game offer scores were recorded in GBP; for example, a score of 2.50 indicates an offer of £2.50. Dictator game instructions are presented in Appendix B.

Our second observed egalitarianism measure was "equity sensitivity" (Huseman, Hatfield and Miles, 1985, 1987), a five-item index (Cronbach's α = .83) assessing how much one values one's own interests versus those of one's group/organization (Note that although equity sensitivity includes "equity" in its name, it does not measure equity as this term is conventionally defined in the organizational behavior literature, that is, in relation to the extent to which one's "inputs" [e.g., work effort] are proportional to one's "outcomes" [e.g., salary] [Greenberg and Colquitt, 2005]). We used standard equity

sensitivity index items (Mueller and Clarke, 1998), but reworded them slightly because our participants were not employees (e.g., "organization" became "group"). For each item (e.g., "In any social group I might be a member of, it would be more important for me to [a] get from the group, or [b] give to the group"), participants allocated 10 points between the two answer choices. For example, if they valued their own and the group's interests equally, they would allocate five points to each. Equity sensitivity was the mean number of points allocated to more pro-group choices. All equity sensitivity items are presented in Appendix C.

Our third observed egalitarianism measure was a three-item index (Cronbach's α = .84) of preference for a more redistributive political philosophy (socialism) over a less redistributive one (capitalism). This preference was the mean response on a 7-point scale ranging from "not true" to "very true," to three statements: "I would rather live in a Capitalist society than a Socialist society" (reverse-coded); "I would rather live in a Socialist society than a Capitalist society"; "Capitalism is a fairer system than Socialism" (reverse-coded).

Rated egalitarianism

We measured rated egalitarianism using the same 3D body model videos used for attractiveness ratings (however, egalitarianism and attractiveness were measured by different groups of raters). The perceived egalitarianism of each model was rated by 12 raters (six same-sex, six opposite-sex) on a scale of 1 ("selfish and competitive") to 7 ("altruistic and egalitarian"). Inter-rater agreement was fairly low (Cronbach's α = .40 for female targets, .56 for male targets), but this had little effect on the results of interest and was not judged to be a major impediment to analysis (this issue is considered in more detail in the Discussion). The egalitarianism rating instructions are presented in Appendix D.

Results

Several variables were measured in sex-specific ways (e.g., anthropometric measures of attractiveness and formidability were different in each sex), so the sexes were analyzed separately when these variables were involved. Other variables were measured in the same way for both sexes, and therefore the sexes were combined for analyses involving these variables. We present results below in separate analyses of: (1) men and women combined, (2) men only, (3) women only, and (4) sex differences in correlations.

Men and Women Combined

Inter-correlations and descriptive statistics for all variables that were measured in the same way for both sexes are shown in Table 1. Significance values reported in association with Table 1 correlations have not been corrected for multiple comparisons and so do not represent tests of any stated predictions. Significance values reported in Table 1 and throughout this paper are two-tailed.

Table 1. Descriptive statistics and inter-correlations (male and female participants combined)

	1	2	3	4	5	6	7	8	9	10	11
1. Waist-to-hip Ratio	-										
2. Volume-Height Index	.29**	-									
3. Rated Attractiveness	-.41**	-.39**	-								
4. Grip Strength	.48**	.05	.02	-							
5. Dictator Game Offer	-.01	<.01	-.06	-.03	-						
6. Equity Sensitivity	-.17	.09	-.10	-.29**	.26**	-					
7. Socialism Preference	-.05	.11	-.16	-.17	.17	.15	-				
8. Rated Egalitarianism	.36**	.30**	-.65**	.04	.03	.04	.15	-			
9. Gen. Obs. Egalitarian.	-.12	.09	-.15	-.23*	.73**	.71**	.58**	.09	-		
10. Age	.37**	.08	-.17	.31**	.13	.03	-.21*	.04	<.01	-	
11. Wealth	.29**	.09	-.09	.23*	-.12	-.16	-.18*	.19*	-.22*	.14	-
M	.76	28.77	3.04	29.75	2.26	5.46	4.11	3.96	0.00	21.63	45.29
SD	.06	4.91	1.01	10.33	1.23	1.28	1.54	.57	1.00	4.87	18.77
N	125	124	124	125	125	124	123	125	123	123	123

Note. *p* < .05, **p* < .01; Significance levels have not been corrected for multiple comparisons.

Principal components analysis for combined male-female sample. We used principal components analysis (PCA) to distill our set of specific measures into a smaller set of general variables. Each of these general variables captured the shared variance in specific measures that was most relevant in enabling us to test the predictions. PCA was also useful for managing the multiple comparisons problem because it enabled us to consolidate multiple variables into single variables. The only PCA we conducted for variables that were measured in the same way for both sexes was that involving the specific measures of observed egalitarianism (Equity Sensitivity, Dictator Game Offer, and Socialism Preference). Therefore, this "General Observed Egalitarianism" PCA is the only one reported in this section. The three specific observed egalitarianism measures were entered into a PCA, and the component that explained the most shared variance in the specific measures (Component 1) was retained as the General Observed Egalitarianism variable. Component 1 was the only component extracted with an Eigenvalue of at least 1.0, and all specific measures loaded on it ($\geq$ .50) in the expected direction (see Table 2).

Table 2. PCA factor loadings for general observed egalitarianism component (combined male-female sample)

General Variable	Specific Variables and Factor Loadings
General Observed Egalitarianism (Eigenvalue = 1.39, 46% of total variance)	Equity Sensitivity (.71) Dictator Game Offer (.73) Socialism Preference (.58)

Overall, women exhibited higher observed egalitarianism than men. Using specific observed egalitarianism measures, the prediction that women would exhibit higher observed egalitarianism than men was tested three times, because there were three egalitarianism measures (Equity Sensitivity, Dictator Game Offer, and Socialism Preference). The prediction was supported in the case of Equity Sensitivity (male $M = 5.16$, female $M = 5.77$, $t[122] = -2.71$, $p = .008$), marginally supported in the case of Socialism Preference (male $M = 3.85$, female $M = 4.36$, $t[121] = -1.87$, $p = .064$), and unsupported in the case of Dictator Game Offer (male $M = 2.17$, female $M = 2.35$, $t[123] = -0.78$, $p = .438$). The association between Sex and Equity Sensitivity remained significant after applying a Bonferroni-corrected p value of .017. The prediction of higher observed egalitarianism in women was also tested once using the General Observed Egalitarianism component—thus obviating the need to correct for multiple comparisons. The results supported the prediction (male $M = -0.23$, female $M = 0.22$, $t[121] = -2.60$, $p = .011$). The relationship between Sex and General Observed Egalitarianism remained significant after controlling for the effects of the other predictors on General Observed Egalitarianism (see below).

In the combined sample, there was some evidence of a negative relationship between observed egalitarianism and attractiveness. Using specific egalitarianism measures, the prediction of a negative relationship between observed egalitarianism and attractiveness was tested three times in the combined sample using the three egalitarianism measures and the one attractiveness measure that was not intended to be sex-specific (Rated Attractiveness). None of these three correlations were significant, even before correcting for multiple comparisons. The prediction was also tested once using the General Observed Egalitarianism component and Rated Attractiveness; this correlation was in the expected direction but did not achieve significance, $r(120) = -.15$, $p = .111$. However, the relationship between Rated Attractiveness and General Observed Egalitarianism did become significant after controlling for the effects of the other predictors on General Observed Egalitarianism (see multiple regression model at end of this section).

In the combined sample, perceived egalitarianism was significantly negatively related to attractiveness. The prediction of a negative relationship between Rated Egalitarianism and attractiveness was tested once in the combined sample using the only sex-neutral attractiveness measure (Rated Attractiveness). This relationship was strongly negative ($r[122] = -.65$, $p < .001$), and remained so after controlling for the effects of Age and Sex on Rated Egalitarianism in a multiple regression model ($\beta = -.64$, $t[118] = -9.23$, $p < .001$).

In the combined sample, observed egalitarianism was not significantly related to formidability, after controlling for sex. Using specific egalitarianism and formidability measures, we tested for the existence of a relationship between observed egalitarianism and formidability three times using the three egalitarianism measures and the one sex-neutral

formidability measure (Grip Strength). Only the correlation between Grip Strength and Equity Sensitivity was significant ($r[122] = -.29$, $p = .001$), and it remained significant after applying a Bonferroni-corrected p value of .017. The prediction was also tested once using General Observed Egalitarianism, which also produced a significant correlation with Grip Strength ($r[121] = -.23$, $p = .010$). However, the significance of these correlations was due to the fact that compared to women, men scored lower on Equity Sensitivity and General Observed Egalitarianism (as reported above) and much higher on grip strength (male mean = 37.50, female mean = 21.88, $t[123] = 12.92$, $p < .001$). After controlling for the effects of Sex on Equity Sensitivity, the correlation between Grip Strength and Equity Sensitivity fell to marginal significance (partial $r[121] = -.17$, $p = .067$), and after controlling for the effects of Sex on General Observed Egalitarianism, the correlation between Grip Strength and General Observed Egalitarianism became non-significant (partial $r[120] = -.09$, $p = .333$).

In the combined sample, there was some evidence of a marginally significant negative relationship between observed egalitarianism and wealth. Using specific egalitarianism measures, we tested three times for the existence of a relationship between observed egalitarianism, using the three egalitarianism measures and the one wealth measure. The only significant correlation of these three was between Wealth and Socialism Preference ($r[121] = -.18$, $p = .049$), but it did not remain significant after applying a Bonferroni-corrected p value of .017. When the prediction was tested once using General Observed Egalitarianism, the result was a significant negative correlation with Wealth ($r[121] = -.22$, $p = .016$). However, the relationship between Wealth and General Observed Egalitarianism fell to marginal significance after controlling for the effects of the other predictors on General Observed Egalitarianism (see Table 3).

Table 3. General observed egalitarianism regressed on age, sex, wealth, and rated attractiveness (combined male-female sample)

Predictor	β	t
Age	.09	0.88
Sex (0 = male, 1 = female)	.25*	2.47
Wealth	-.17	-1.87
Rated Attractiveness	-.18*	-2.01

Note. *$p < .05$; Total $R = .35$, Adjusted $R^2 = .09$, $p = .004$, $df = 120$.

Sex, wealth, and attractiveness were all at least marginally significant predictors of observed egalitarianism, in a multiple regression model involving the combined sample. In order to determine the unique variance explained in General Observed Egalitarianism by the predictors, General Observed Egalitarianism was regressed on Age, Sex (men = 0, women = 1), Wealth, and Rated Attractiveness. Results are shown in Table 3. Beta values were significant in the expected directions for Sex ($p = .015$) and Rated Attractiveness ($p = .047$), and marginally significant in the expected direction for Wealth ($p = .065$). The sex-neutral predictor of formidability, Grip Strength, was omitted from this model because it shared so much variance with Sex; as discussed above, Grip Strength's significant effect on observed egalitarianism in the combined sample was fully mediated by its relationship to Sex. When Grip Strength was included in this model, it failed to explain unique variance in General Observed Egalitarianism, and at the same time it neutralized the significant predictive effects of Sex.

In the combined sample, no significant variance in observed egalitarianism was explained by interaction effects between sex and formidability or between sex and attractiveness. Two multiple regression models were created to test for predicted sex differences using the combined sample: (1) that negative correlations between observed egalitarianism and formidability would be observed only among men, and (2) that negative correlations between observed egalitarianism and attractiveness would be stronger among men than among women. Although both of these interaction effects were in the expected direction of correlations being more negative among men, neither effect was significant. In the first model, General Observed Egalitarianism was regressed on Age, Sex (men = 0, women = 1), Grip Strength, and the Sex-Grip Strength interaction term; the interaction was not significant (β = .46, t[117] = 1.43, p = .155). In the second model, General Observed Egalitarianism was regressed on Age, Sex, Rated Attractiveness, and the Sex-Rated Attractiveness interaction term; this interaction was also not significant (β = .51, t[116] = 1.64, p = .103).

Men

Inter-correlations and descriptive statistics for all male variables are shown in Table 4. (As with Table 1, note that significance levels in Table 4 have not been corrected for multiple comparisons).

Principal components analysis for men. We used PCA to create male-specific General Attractiveness and General Formidability variables. As in the creation of General Observed Egalitarianism described above, we created these general variables by entering specific measures into a PCA, and retaining Component 1 as the general variable. In both PCAs, Component 1 was the only component extracted with an Eigenvalue of at least 1.0, and all specific measures loaded on it ($\geq$ .5) in the expected direction. Table 5 shows male-specific factor loadings for General Attractiveness, General Formidability, and General Observed Egalitarianism.

Among men, observed egalitarianism was related negatively to attractiveness, but not to formidability. Using specific egalitarianism and attractiveness measures, the prediction of a negative relationship between egalitarianism and attractiveness was tested six times, using three measures of egalitarianism (Equity Sensitivity, Dictator Game Offer, and Socialism Preference) and two measures of attractiveness (Waist-to-chest Ratio and Rated Attractiveness). All six correlations were of a similar magnitude in the expected direction, and three were significant according to the uncorrected p values shown in Table 4; however, none were significant using a Bonferroni-corrected p value of .008. The prediction was also tested once using the General Observed Egalitarianism and General Attractiveness components and, as predicted, these variables were significantly negatively related (r[59] = -.36, p = .004). This relationship remained significant after controlling for the effects of the other predictors on General Observed Egalitarianism (see Table 7).

Table 4. Descriptive statistics and inter-correlations (sex-segregated)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	Women M	SD
1. WCR or WHR	–	.34**	-.57**	-.75**	.40**	-.12	.20	-.04	-.05	<.01	-.05	.41**	.05	-.03	.72	.05
2. Volume-Height Index	.52**	–	-.70**	-.83**	.95**	.09	.69**	-.12	.04	.05	-.02	.58**	.06	.16	29.06	5.65
3. Rated Attractiveness	-.63**	-.13	–	.92**	-.71**	<.01	-.47**	.15	-.08	-.09	<-.01	-.61**	-.18	-.15	3.20	0.89
4. General Attractiveness	-.90**	-.36**	.90**	–	-.82**	-.02	-.55**	.13	-.01	-.06	.04	-.64**	-.15	-.12	0.00	1.00
5. Upper Body Size	.06	.80**	.21	.08	–	.07	.73**	-.05	.11	-.01	.02	.56**	.03	.20	-.93	1.78
6. Grip Strength	-.25	.20	.36**	.34**	.36**	–	.73**	.24	-.12	.03	.09	-.06	.15	-.11	21.88	6.18
7. General Formidability	-.11	.61**	.35**	.25*	.82**	.82**	–	.13	<-.01	.02	.08	.34**	.12	.06	0.00	1.00
8. Dictator Game Offer	.26*	.13	-.22	-.26*	.10	-.09	<.01	–	.09	.08	.67**	.01	.02	-.07	2.35	1.11
9. Equity Sensitivity	.25*	.12	-.18	-.24	.04	-.20	-.10	.35**	–	<-.01	.60**	.18	.02	.14	5.77	1.12
10. Socialism Preference	.24	.18	-.28*	-.29*	.05	-.15	-.06	.22	.21	–	.55**	.08	.02	-.19	4.36	1.52
11. Gen. Observed Egalitarian.	.35**	.20	-.30*	-.36**	.09	-.20	-.07	.78**	.76**	.59**	–	.15	.02	-.06	0.23	0.82
12. Rated Egalitarianism	.37**	.05	-.66**	-.57**	-.23	-.32**	-.33**	.08	.04	.31*	.17	–	.02	.07	3.83	0.50
13. Age	.22	.25	-.15	-.20	.17	-.08	.05	.31*	.11	-.07	.20	-.16	–	.17	19.66	3.68
14. Wealth	.01	.06	.04	.02	.05	.05	.06	-.12	-.27*	-.08	-.23	.16	-.10	–	39.37	17.49
Men M	0.78	28.50	2.88	0.00	0.48	37.50	0.00	2.17	5.16	3.85	-0.23	4.09	23.64	51.31		
Men SD	0.04	4.10	1.09	1.00	0.76	7.28	1.00	1.34	1.37	1.53	1.12	0.60	5.13	18.24		

Note. *p < .05, **p < .01; Correlations for men (*n* = 60–63) are presented below the diagonal and correlations for women (*n* = 60–62) are presented above the diagonal; *M* and *SD* are presented in the rows for men and in the columns for women; Significance levels have not been corrected for multiple comparisons; Variable 1 is Waist-to-Chest Ratio for men and Waist-to-Hip Ratio for women; Upper Body Size, General Formidability, and General Attractiveness were calculated in sex-specific ways; Two female age scores were omitted from correlations (but included in *M* and *SD*) because they caused misleadingly strong correlations (maximum Cook's *D* = 2.04).

Table 5. PCA factor loadings for general variables (male sample only)

General Variable	Specific Variables and Factor Loadings
General Observed Egalitarianism (Eigenvalue = 1.54, 51% of total variance)	Equity Sensitivity (.76) Dictator Game Offer (.77) Socialism Preference (.61)
General Attractiveness (Eigenvalue = 1.63, 82% of total variance)	Waist-to-chest Ratio* (.90) Rated Attractiveness (.90)
General Formidability (Eigenvalue = 1.82, 91% of total variance)	Upper Body Size (.96) Grip Strength (.96)

Note. *Reverse-coded.

Using specific egalitarianism and formidability measures, the prediction of a negative relationship between egalitarianism and formidability in men was tested six times using the three egalitarianism measures and two formidability measures (Upper Body Size and Grip Strength). None of these correlations were significant, even before correcting for multiple comparisons. The prediction was also tested once using the General Observed Egalitarianism and General Formidability components, which were not significantly related (r[59] = -.07, p = .61). This relationship remained non-significant after controlling for the effects of the other predictors on General Observed Egalitarianism (see multiple regression model at end of this section).

Among men, perceived egalitarianism was related negatively to both attractiveness and formidability. The prediction of a negative relationship between perceived egalitarianism and attractiveness in men was tested twice using the one perceived egalitarianism measure (Rated Egalitarianism) and the two specific attractiveness measures (Waist-to-chest Ratio and Rated Attractiveness). Both of these correlations were in the expected direction, and both remained significant after applying a Bonferroni-corrected p value of .025. The prediction was also tested once using the General Attractiveness component, which was significantly negatively related to Rated Egalitarianism (r[61] = -.57, p < .001); this relationship remained significant after controlling for the effects of Age and General Formidability on Rated Egalitarianism (β = -.58, t[57] = -5.37, p < .001).

The prediction of a negative relationship between perceived egalitarianism and formidability in men was also tested twice using Rated Egalitarianism and the two formidability measures (Upper Body Size and Grip Strength). Both of these correlations were in the expected direction, and one of them (Grip Strength) remained significant after applying a Bonferroni-corrected p value of .025. The prediction was also tested once using the General Formidability component, which was significantly negatively related to Rated Egalitarianism (r[61] = -.33, p = .008). This relationship remained significant after controlling for the effects of Age on Rated Egalitarianism; however, it became non-significant (β = -.16, t[57] = -1.51, p = .137) after controlling for the effects of General Attractiveness on Rated Egalitarianism due to the shared variance between General Attractiveness and General Formidability (r[61] = .25, p = .044).

The male bodily traits most associated with attractiveness and formidability each contributed uniquely to explain variance in Rated Egalitarianism: As shown in Table 6, multiple regression revealed that Waist-to-chest Ratio and Upper Body Size each explained significant variance in Rated Egalitarianism that was not explained by the other. Figure 1

depicts the male with the lowest Rated Egalitarianism score and the second-highest Rated Attractiveness score.

Table 6. Rated egalitarianism regressed on anthropometric predictors among men and women, respectively

	Predictor	β	T	df	Total R
Men	Waist-to-chest Ratio	.39**	3.35	60	.45**
	Upper Body Size	-.25*	-2.16		
Women	Waist-to-hip Ratio	.23*	2.10	58	.62***
	Volume-Height Index	.50***	4.54		

Note. *$p < .05$, ** $p < .01$, *** $p < .001$.

There was evidence of a marginally-significant negative relationship between wealth and egalitarianism among men. Using specific egalitarianism measures, the prediction of a negative relationship between observed egalitarianism and wealth in men was tested three times, using the three observed egalitarianism measures and Wealth. All of these correlations were in the expected direction, and one of them (that involving Equity Sensitivity) was significant according to the uncorrected p value; however, none of them were significant using a Bonferroni-corrected p value of .017. The prediction was also tested once using the General Observed Egalitarianism component, which was marginally significantly negatively related to Wealth ($r[59] = -.23$, $p = .081$) among men. This relationship remained marginally significant after controlling for the effects of the other predictors on General Observed Egalitarianism (see Table 7).

Table 7. Stepwise regression of general observed egalitarianism on predictors among men

Predictor	ΔR^2	β	t
Step 1	.084		
Age		.09	0.73
Wealth		-.22	-1.75
General Formidability		.03	.24
Step 2	.100*		
General Attractiveness		-.34*	-2.60

Note. *$p < .05$. Total $R = .43$, Adjusted $R^2 = .13$, $p = .022$, $df = 55$.

Among men, when General Observed Egalitarianism was regressed on all predictors, attractiveness was the only significant predictor. In order to compare the effects of all predictors of General Observed Egalitarianism among men, General Observed Egalitarianism was regressed on Age, Wealth, General Formidability, and General Attractiveness. The only predictor that explained significant unique variance in General Observed Egalitarianism was General Attractiveness ($\beta = -.34$, $t[55] = -2.60$, $p = .012$), and the only other predictor associated with a p value below .468 was Wealth ($\beta = -.22$, $t[55] = -1.75$, $p = .085$). In Table 7, we present this model in stepwise format to illustrate that General Attractiveness explained variance in General Observed Egalitarianism above and beyond that explained by Wealth (and the other predictors). However, despite the relative usefulness of General Attractiveness as a predictor in this model, other results indicated

that it was not significantly better than Wealth as a predictor of General Observed Egalitarianism: An asymptotic *z*-test (Steiger, 1980) indicated that the correlations between General Observed Egalitarianism and Wealth ($r[59] = -.23$, $p = .081$) and between General Observed Egalitarianism and General Attractiveness ($r[59] = -.36$, $p = .004$) were not significantly different ($z = .79$, $p = .431$).

There was no evidence that wealth and formidability (or other predictors) interacted to explain variance in male observed egalitarianism. As noted above, our main goal with regard to testing for interaction effects was to look for effects similar those reported by Peterson et al. (2013), who found that formidability and support for economic redistribution were positively correlated in lower-income men, and negatively correlated in higher-income men. We regressed General Observed Egalitarianism on Age, Wealth, General Formidability, and the Wealth-General Formidability interaction term, and found no predictor to be significant (all *p*'s ≥ .075). The Wealth-General Formidability interaction was not far from significant ($\beta = .22$, $t[55] = 1.66$, $p = .102$), but was in the opposite direction of that predicted by Peterson et al. (2013); that is, in our results, the correlation between formidability and egalitarianism was non-significantly more positive among wealthier men. We also ran this model with Socialism Preference rather than General Observed Egalitarianism as the outcome variable, because Socialism Preference was the most similar of all our egalitarianism measures to the "support for economic redistribution" outcome variable used by Petersen et al. (2013). In this model, again no predictor was significant (all *p*'s ≥ .485), and the Wealth-General Formidability interaction was again in the opposite direction of that predicted by Peterson et al. (2013), however the effect was far from significant ($\beta = .07$, $t[55] = .52$, $p = .608$).

In addition to testing whether significant variance in General Observed Egalitarianism among men was explained by a Wealth-General Formidability interaction, for exploratory purposes we also created regression models to see if any such variance was explained by a Wealth-General Attractiveness interaction or a General Formidability-General Attractiveness interaction (both models controlled for Age). Neither of these other two interaction effects were significant (both *p*'s ≥ .765).

Women

Inter-correlations and descriptive statistics for all female variables are shown in Table 4. (Again, note that significance levels in this table have not been corrected for multiple comparisons).

Principal components analysis for women. We used PCA to create two female-specific general variables: General Attractiveness and General Formidability. As in the creation of other general variables described above, we created these by entering specific measures into a PCA, and retaining Component 1 as the general variable. In both PCAs, Component 1 was the only component extracted with an Eigenvalue of at least 1.0, and all specific measures loaded on it (≥ .5) in the expected direction. Table 8 shows factor loadings for General Attractiveness and General Formidability among women, as well as female-specific loadings for General Observed Egalitarianism.

Table 8. PCA factor loadings for general variables (female sample only)

General Variable	Specific Variables and Factor Loadings
General Observed Egalitarianism (Eigenvalue = 1.12, 37% of total variance)	Equity Sensitivity (.55) Dictator Game Offer (.75) Socialism Preference (.50)
General Attractiveness (Eigenvalue = 2.10, 70% of total variance)	Waist-to-hip Ratio* (.75) Volume-Height Index* (.83) Rated Attractiveness (.92)
General Formidability (Eigenvalue = 1.07, 54% of total variance)	Upper Body Size (.73) Grip Strength (.73)

Note. *Reverse-coded.

Among women, observed egalitarianism was related to neither attractiveness nor formidability. Using specific egalitarianism and attractiveness measures, the prediction of a negative relationship between egalitarianism and attractiveness in women was tested nine times, because there were three measures of egalitarianism and three of attractiveness (Waist-to-hip Ratio, Volume-Height Index, and Rated Attractiveness).[3] There were no significant correlations between any attractiveness measure and any observed egalitarianism measure in women, even before correcting for multiple comparisons. The prediction was also tested once using the General Observed Egalitarianism and General Attractiveness components, which were not significantly related ($r[58] = -.04$, $p = .770$). This relationship remained non-significant after controlling for the effects of the other predictors on General Observed Egalitarianism (see multiple regression model at end of this section).

Using specific egalitarianism and formidability measures, we ran six tests for a relationship between egalitarianism and formidability in women using the three egalitarianism measures and two formidability measures (Upper Body Size and Grip Strength). None of these correlations were significant, even before correcting for multiple comparisons. The prediction was also tested once using the General Observed Egalitarianism and General Formidability components, which were not significantly related ($r[60] = .08$, $p = .56$). This relationship remained non-significant after controlling for the effects of the other predictors on General Observed Egalitarianism (see below).

Among women, perceived egalitarianism was related negatively to attractiveness, but not to formidability (after controlling for attractiveness). The prediction of a negative relationship between perceived egalitarianism and attractiveness in women was tested three times with specific attractiveness measures, using the one perceived egalitarianism measure (Rated Egalitarianism) and the three female attractiveness measures. All of these correlations were in the expected direction, and all remained significant using a Bonferroni-corrected p value of .017. The prediction was also tested once using the General Attractiveness component, which was significantly negatively related to Rated Egalitarianism ($r[58] = .64$, $p < .001$). This relationship remained significant ($\beta = -.66$,

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[3] Note that there are theoretical reasons to expect for Volume-Height Index to have a quadratic rather than linear relationship with attractiveness (Price et al., 2013). However, in our sample the quadratic and linear relationships between Volume-Height Index and Rated Attractiveness were identical (for both, $R^2 = .49$, $p < .001$). We therefore treated Volume-Height Index as a linear predictor.

t[56] = -5.39, *p* < .001) after controlling for the effects of Age and General Formidability on Rated Egalitarianism.

The female bodily traits most associated with attractiveness each contributed uniquely to explain variance in Rated Egalitarianism: As shown in Table 6, multiple regression revealed that Waist-to-hip Ratio and Volume-Height Index each explained significant variance in Rated Egalitarianism that was not explained by the other. Figure 1 depicts the female with the second-lowest Rated Egalitarianism score and the second-highest Rated Attractiveness score.

We tested for a relationship between Rated Egalitarianism and formidability in women using the two specific formidability measures (Upper Body Size and Grip Strength). Rated Egalitarianism was not significantly related to Grip Strength, but was strongly positively related to Upper Body Size (*r*[60] = .56, *p* < .001). Due to this strong relationship, there was also a significant positive correlation between Rated Egalitarianism and General Formidability (*r*[60] = .34, *p* = .007). However, the significance of these correlations was due to Rated Egalitarianism being related negatively to attractiveness, and attractiveness in turn being negatively related to Upper Body Size, among women. After controlling for the effects of General Attractiveness on Rated Egalitarianism in women, the partial correlations between Upper Body Size and Rated Egalitarianism and between General Formidability and Rated Egalitarianism fell to non-significance (*p*'s ≥ .754).

Among women, observed egalitarianism was not related to wealth. Using the three specific observed egalitarianism measures, we ran three tests for the existence of a relationship between egalitarianism and Wealth among women. None of these correlations were significant, even before correcting for multiple comparisons. The prediction was also tested once using the General Observed Egalitarianism component, which was not significantly related to Wealth (*r*[60] = -.06, *p* = .630); this relationship remained non-significant after controlling for the effects of the other predictors on General Observed Egalitarianism (see below).

Among women, when General Observed Egalitarianism was regressed on all predictors, there were no significant predictors. In order to compare the effects of all predictors of General Observed Egalitarianism among women, General Observed Egalitarianism was regressed on Age, Wealth, General Formidability, and General Attractiveness. No predictor was significant (all *p*'s ≥ .383).

There was no evidence that predictors interacted to explain variance in female observed egalitarianism. Just as we did for men, we created multiple regression models to test whether significant variance in General Observed Egalitarianism among women was explained by a Wealth-General Formidability interaction, a Wealth-General Attractiveness interaction, or a General Formidability-General Attractiveness interaction (all models controlled for Age). None of these three interaction effects were significant (all *p*'s ≥ .228).

Sex differences in the strength of correlations

We conducted independent samples *z*-tests in order to investigate whether negative correlations between observed egalitarianism and formidability, and between observed egalitarianism and attractiveness, were significantly stronger among men than among women. The correlations between General Observed Egalitarianism and General Formidability among women (*r*[60] = .08, *p* = .559) and men (*r*[59] = -.07, *p* = .610) were not significantly different (*z* = .77, *p* = .441). However, the correlations between General

Observed Egalitarianism and General Attractiveness among women ($r[58] = .04$, $p = .770$) and men ($r[59] = -.36$, $p = .004$) were significantly different ($z = 2.23$, $p = .026$).

Discussion

Perhaps the most interesting finding reported above was the moderately strong and significantly negative linear association between attractiveness and observed egalitarianism among men. When General Observed Egalitarianism was regressed on all main predictors among men (Age, Wealth, General Formidability, General Attractiveness), General Attractiveness was the only significant predictor, whereas Wealth had a marginally significant negative effect. Although researchers often use socioeconomic status as a predictor of egalitarianism and prosociality without considering the predictive effects of attractiveness (Gelman, Kenworthy, and Su, 2010; Gelman, Shor, Bafumi, and Park, 2007; Kunovich and Slomczynski, 2007; Piff et al., 2010, 2012; Ritzman and Tomaskovic-Devey, 1992), results of the current study suggest that attractiveness may be no less important than wealth as a predictor of egalitarianism among men.

Also intriguing were the strong negative relationships between attractiveness and Rated Egalitarianism among both male and female targets, and the moderate negative relationship between formidability and Rated Egalitarianism among male targets only. The low inter-rater agreement about Rated Egalitarianism (noted above) appeared to weaken these relationships to some degree, but not to alter their general nature. Cronbach's α could be increased from .40–.56 to .68–.70 for each ratings set by excluding the three most idiosyncratic raters from each set; doing so increased correlations between Rated Egalitarianism and Rated Attractiveness from -.66 to -.77 for male targets and from -.61 to -.67 for female targets. Although the low internal consistency of Rated Egalitarianism did not have a strong impact on the correlations of interest, however, it does suggest that bodily shape may not be a particularly obvious or reliable cue to egalitarianism. It is also possible that raters were introducing noise into the ratings by approaching the task of rating egalitarianism in divergent ways (e.g., by interpreting the instructions differently; we discuss this possibility further in the "limitations" section below). Still, the strong negative relationships found between Rated Egalitarianism and attractiveness/formidability could plausibly indicate how raters would expect personality and behavior to relate to attractiveness/formidability, all else equal, in everyday life. These results thus suggest that in the social experience of raters, people who are more attractive/formidable tend to behave in a less egalitarian manner.

Other results reported above are notable as attempts to approximately replicate findings that had been reported previously (we say "approximately" replicate because we did not measure all variables in the same manner as in previous studies, as we discuss below). Some of these attempts were in agreement with earlier findings: Consistent with many previous studies (Baron-Cohen, 2008; Croson and Gneezy, 2009; Inness et al., 2004), we found evidence of higher observed egalitarianism among women than among men. Consistent with Price et al. (2011) and Takahashi et al. (2006), we found no evidence that observed egalitarianism was related to attractiveness (as assessed via anthropometric measures and/or the ratings of other people, as opposed to self-assessed attractiveness) among women. Some of our other results were inconsistent with previous findings: Contrary to Price et al. (2011), we found no evidence that men's observed egalitarianism

was related to their bodily formidability, and contrary to Peterson et al. (2013), we found no evidence that wealth and formidability interacted to explain variance in observed egalitarianism in general, or in support for a more economically redistributive political system specifically. What might account for this lack of support for these earlier findings? One likely explanation is that our egalitarianism measures were substantially different from those used by Price et al. (2011) and Peterson et al. (2013) (note also that these two studies themselves used egalitarianism measures that were quite different from one another). Moreover, our formidability and wealth measures were also different from those used by Peterson et al. (2013). The fact that we used different variables than these previous studies substantially reduces the extent to which our study can be regarded as involving straightforward attempts to replicate their findings.

Limitations

An important limitation of the current study is its correlational nature. Bodily attractiveness could be related to egalitarianism in men not because having a more attractive body causes men to be less egalitarian, but because being less egalitarian causes men to invest more in their own physical condition (e.g., via exercise); or perhaps egalitarianism and the tendency to invest in one's own physical condition are both influenced by some more fundamental individual difference variable. In future correlational studies of bodily condition and cognition/behavior, it will be important to control for investment in own condition (e.g., time spent in the gym). It would also be interesting to experimentally manipulate one's relative bodily condition in order to see if this affects egalitarianism; for example, do men become more egalitarian in the presence of men who are in better condition—and less egalitarian in the presence of men who are in worse condition—than they are?

Other limitations have to do with the ways in which we measured egalitarianism. Our three specific egalitarianism measures were, in some respects, quite different from one another, which made it harder to conceive of these variables in a conceptually unified way. We thought that the common psychological qualities measured by these variables were best characterized by the concept of egalitarianism, but we could have increased conceptual clarity in our study by using a less diverse set of outcome variables. Principal components analysis helped us manage this diversity by generating a variable that captured the relevant shared variance among our specific egalitarianism measures. On our General Perceived Egalitarianism variable (and indeed on all general variables we generated via PCA), all specific measures loaded acceptably strongly ($\geq .5$) in the expected direction, so the variance that was captured seemed to be that which was relevant in terms of our theoretical expectations and the predictions that we were testing. Nevertheless, we could have measured egalitarianism in a conceptually simpler way (e.g., by measuring social dominance orientation [Pratto et al., 1994; Price et al., 2011] or support for redistribution [Peterson et al., 2013]).

Another limitation related to our egalitarianism measures is that due to the way in which we asked participants about their preference for socialism over capitalism, we cannot know the extent to which their responses reflected their views about egalitarianism specifically. We did not define socialism and capitalism for participants in terms of economic redistribution. In British society, these terms have connotations (e.g., capitalism is more suggestive of free market competition and inequality, socialism is more suggestive

of redistribution and equality) that we believed would be perceived by participants, especially because we contrasted these two terms directly. We therefore assumed that Socialism Preference would usefully reflect participant preferences for redistribution and equality versus competition and inequality. However, we could be more confident in this assumption if we had defined these terms in a way that focused more specifically on their egalitarian aspects.

An additional limitation is the manner in which we described personality types in the Rated Egalitarianism task. We asked raters to evaluate body models on a scale from "altruistic and egalitarianism" to "selfish and competitive." We chose these terms because we believed that they best represented the qualities measured by the Equity Sensitivity, Dictator Game Offer, and Socialism Preference variables (qualities which we have summarized throughout this paper as "egalitarianism"). However, it may be that our use of multiple descriptors, and/or our confounding of descriptors into pairs, caused uncertainty among raters about what exact qualities they were supposed to be rating. Any noise in the ratings caused by such uncertainty may help explain the relatively low internal consistency of Rated Egalitarianism.

A final limitation we should mention relates to our dictator game instructions. Participants were told that they had a 50/50 chance of being in either the offerer or receiver role, and that if they ended up in the receiver role, their earnings would be "determined by the amount that a previous study participant (chosen at random) decided to share." Therefore, their decision about how much to share with the receiver could not affect their own earnings as the receiver. However, it is possible that being told that they could end up as the receiver made them more likely to empathize with the receiver, which might lead to an increase in average offer size. Although such an increase would not necessarily cause dictator game data in the current study to be uninformative about egalitarian tendencies, it is important to note that the game's design could have influenced offer sizes.

Conclusion

Although we did not find evidence for all predicted negative associations between egalitarianism and physical indices of bargaining power (formidability and attractiveness), the significant relationships we did find were in the direction of bargaining power and egalitarianism being negatively related. Our significant findings, then—like results of previous studies (Holtzman et al., 2011; Price et al., 2011; Sanchez-Pages and Turiegano, 2010; Sell et al., 2009; Takahashi et al., 2006; Zaatari and Trivers, 2007)—provide some support for the view that egalitarianism is reduced in people—especially in men—who possess traits that would have led to high social power ancestrally. Further, our results shine a particularly bright light on the under-appreciated role that physical attractiveness may play as a predictor of egalitarianism in men.

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Appendix A. Attractiveness Rating Form

Instructions:
You will view a 9-10 minute video showing a series of about 60 male bodies. Please rate each body according to how physically attractive you think it is.

The body models you will view were created by a 3D body scanner. Some of these body models contain errors, for example, they may be missing patches of skin or parts of the hand s and feet. Please ignore these errors, and just rate the attractiveness of the body based on its overall shape.

In the video, each body model will be shown with an ID number. On the ratings sheet, each ID number will be presented next to a ratings scale that goes from 1 ('unattractive') to 7 ('attractive'). Rate the attractiveness of each body's shape by circling one number on the scale. An example scale is shown below.

42:   1------------2------------3------------4------------5------------6------------7
           Unattractive   Attractive

Before you begin your ratings, you will be shown a short sample video so that you can see what the body models look like. After you have viewed the sample video, please turn the page to begin your ratings.

Appendix B. Dictator Game Instructions

Economic game instructions: The choices you make in this game will have real economic consequences for yourself and /or others. Please read these instructions carefully so that you understand how this game works.

Two players, Player A and Player B, play this game. Player A receives £5 from the researchers, and he/she chooses how much of this £5 to share with Player B. Player A can give Player B any amount (in increments of 50p), from nothing at all (£0) to the full £5. Whatever amount Player A gives to Player B, Player B gets to keep; whatever amount Player A does NOT give to Player B, Player A gets to keep for him/herself.

You will play the role of EITHER Player A or Player B in this game. Your role will be determined by a coin toss, so you will have a 50% chance of playing either role. Before this coin toss occurs, you will decide how much money you would give to Player B, if you were to end up in the Player A role. If you do end up in the Player A role, then your earnings will be determined by your decision about how much you would give. However, if you end up in the Player B role, then your earnings will be determined by the amount that a previous study participant (chosen at rand om) decided to share with Player B. Further, your decision about how much you would give may end up determining the earnings of a future Player B in this study.

If those instructions are NOT clear, please ask the researcher for clarification. If they ARE clear, then please answer the question below. When you are done, please notify the researcher.

In the role of Player A, I would give the following amount to Player B (circle one):
£0.00 £0.50 £1.00 £1.50 £2.00 £2.50 £3.00 £3.50 £4.00 £4.50 £5.00

Appendix C. Equity Sensitivity Items

Instructions: Each of the following statements has two possible conclusions. For each statement, imagine that you have 10 points that you can distribute between the two conclusions. Distribute MORE of these points to the conclusion that you think BETTER describes your attitude. You can give between 0 and 10 points to each conclusion, as long as the **total points for both conclusions is equal to 10**.

1. In any social group I might be a member of, it would be more important for me to:

(a) get from the group	_____ *(write a number 0-10)*	} *combined total must = 10*
(b) give to the group	_____ *(write a number 0-10)*	

2. In any social group I might be a member of, it would be more important for me to:

(a) help others	_____ *(write a number 0-10)*	} *combined total must = 10*
(b) watch out for my own good	_____ *(write a number 0-10)*	

3. In any social group I might be a member of, I would be more concerned about what I:

(a) received from the group	_____ *(write a number 0-10)*	} *combined total must = 10*
(b) contributed to the group	_____ *(write a number 0-10)*	

4. In any social group I might be a member of, the hard work I would do should benefit:

(a) the group	_____ *(write a number 0-10)*	} *combined total must = 10*
(b) me	_____ *(write a number 0-10)*	

5. In any social group I might be a member of, my personal philosophy in dealing with the group would be:

(a) If I don't look out for myself, nobody else will	_____ *(write a number 0-10)*	} *combined total must = 10*
(b) it's better for me to give than to receive	_____ *(write a number 0-10)*	

Appendix D. Egalitarianism Rating Form

INSTRUCTIONS: Some people have more **selfish and competitive** personalities, and others have more **altruistic and egalitarian** personalities. (Note that 'altruistic' means 'concerned with the well-being of others', and 'egalitarian' means 'in favour of social equality'). We can define these personality types in the following ways:

- **SELFISH and COMPETITIVE** people tend to focus on their own needs and desires (as opposed to the needs and desires of other people), and are interested in winning competitions against others so that they can come out on top. They are not opposed to high social inequality in society, because inequality is the result of competition (some people win, some people lose), and they think that inequality as the result of competition is better than full equality.

- **ALTRUISTIC and EGALITARIAN** people tend to focus on the needs and desires of other people (as opposed to their own needs and desires), and are not very interested in winning competitions against others or in coming out on top. They are opposed to high social inequality in society, because they think that inequality is wrong and that it should be reduced as much as possible, and that full equality is better than inequality as the result of competition.

In this study, you will view a 9-10 minute video showing a series of about 60 (male/female) bodies, and you will be asked to rate each (man/woman) based on whether you think (his/her) personality in real life would be more **selfish and competitive** or more **altruistic and egalitarian**.

The body models you will view were created by a 3D body scanner. Some of these body models contain errors, for example, they may be missing patches of skin or parts of the hand s and feet. Please just ignore these errors.

In the video, each (man/woman)will be shown with an ID number. On the ratings sheet, each ID number will be presented next to a rating scale that goes from 1 ('selfish and competitive') to 7 ('altruistic and egalitarian'). Rate each (man/woman) by circling one number, indicating where you think (he/she) would fall on the scale. An example scale is shown below.

42:   1------------2------------3------------4------------5------------6------------7
      selfish and competitive   altruistic and egalitarian

Before you begin your ratings, you will view a short sample video so that you can see what the body models look like. After you have viewed the sample video, please turn the page to begin your ratings.