

# Economic Inequality and Belief in Meritocracy in the United States\*

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## Abstract

How does the context of income inequality in which people live affect their belief in meritocracy, the ability to get ahead through hard work? One prominent recent study, Newman, Johnston, and Lown (2015*a*), argues that exposure to higher levels of local income inequality lead low-income people to become more likely to reject the dominant U.S. ideology of meritocracy. Here, we show that this sanguine conclusion is not supported by the study’s own empirical results and further that analysis of more and better data yields precisely the opposite conclusion. Consistent with relative power theory, among those with lower incomes, local contexts of greater inequality are associated with more widespread belief that people can get ahead if they are willing to work hard.

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Meritocracy—the idea that if one works hard, one can get ahead—is a core tenet of the American Dream (see, e.g., Hochschild 1995, 21-23). How belief in meritocracy fares in the face of the stark economic inequality that has come to characterize life in the United States is therefore crucial to understanding not only support for redistributive policies to address this inequality but also the continuing legitimacy of the U.S. economic system as a whole. This question and related ones regarding the relationship between economic inequality and political attitudes and beliefs have attracted considerable scholarly attention of late.

In contrast to a range of earlier studies that found that greater inequality tends to be associated with attitudes that reinforce the status quo, Newman, Johnston, and Lown (2015*a*, hereafter NJL) advances the argument that inequality in the United States activates class conflict, leading poorer individuals in local contexts of higher inequality to reject meritocracy and become more class conscious. However, that article crucially misinterprets the interaction term in its model (see, e.g., Brambor, Clark, and Golder 2006). We correct this error and show that the article’s own analysis provides no support for its conclusion.

Further, reproducing the above result from the materials the authors provide (Newman, Johnston, and Lown 2015*b*) uncovered other problems. We therefore present here a full, independent replication, bringing more and better data as well as an improved specification to examine how local contexts across the United States shape beliefs about whether people can get ahead if they are willing to work hard. This analysis finds no evidence for the Panglossian argument of NJL (p.329) that high levels of economic inequality work to activate an “oppositional consciousness” among lower-income individuals and so are ultimately self-correcting. Consistent with prior research, the results instead indicate that lower-income individuals are *less* likely to reject the meritocratic ideal where economic inequality is greater.

## A Review of the Theories at Stake

The crucial relationship between economic inequality and system-supporting beliefs like meritocracy is the subject of two diametrically opposed theories: the conflict theory and the relative power theory. As noted above, NJL advocates the former. This theory maintains that, for lower-income individuals, being confronted with higher levels of inequality locally “increases the salience of their disadvantaged position” (NJL, 327), promotes class consciousness, and, in turn, increases demand for redistribution. Higher-income individuals in high inequality contexts, on the other hand, are expected to avoid guilt while protecting their privilege by becoming even more likely to believe in the importance of individual effort to the distribution of economic rewards. The conflict theory has received sustained attention, but empirical support has been at best mixed (see, e.g., Oliver 2001; Brady 2004; Solt 2010).

The relative power theory, on the other hand, starts with the proposition that money is a political resource: that is, that it can be used to influence others. Therefore, the theory contends, where the rich are richer relative to the poor, they will also be more powerful relative to the poor (Goodin and Dryzek 1980). With regard to attitudes and beliefs like meritocracy, this theory suggests that the greater power imbalance that results from higher levels of economic inequality provides higher-income people with more resources to spread their views while depriving poorer people to a greater degree of the resources to resist. This gives poorer people “a greater susceptibility to the internalization of the values, beliefs, or rules of the game of the powerful as a further adaptive response—i.e., as a means of escaping the subjective sense of powerlessness, if not its objective condition” (Gaventa 1980, 17). Patterns of religiosity (Solt, Habel, and Grant 2011; Solt 2014), respect for authority (Solt

2012), and policy mood (Kelly and Enns 2010) have provided support for this theory.

## Reproduced Results and Corrected Interpretation

Using the data files and R commands provided (Newman, Johnston, and Lown 2015b), we were able to reproduce a close approximation of the article’s main results.<sup>1</sup> As these files note that the authors are themselves unable to reproduce the published estimates exactly, and the differences are indeed quite small, we proceed to interpretation.

NJL (p.334) claims that its analysis “reveals that among low-income citizens, those residing in highly unequal contexts are significantly more likely to reject meritocratic ideals than those in relatively equal contexts [and] indicates that as we move from those with the lowest to highest incomes, the effect of increasing county inequality reverses and is associated with a decrease in the probability of rejecting meritocracy.” This claim is incorrect.

The error lies in the interpretation of the multiplicative interaction term. Though it has been well known for over a decade that models containing multiplicative interaction terms require particular care in interpretation (see, e.g., Golder 2003; Braumoeller 2004; Brambor, Clark, and Golder 2006), many political scientists continue to struggle with them: improperly specified or interpreted interaction terms appear at the top of Nyhan’s (2015) list of “recurring statistical errors” for which reviewers should be sure to check. In the multilevel logistic regression model employed in Newman, Johnston, and Lown (2015a), the logged odds of rejecting meritocracy for individual  $i$  in local context  $j$  are estimated as follows:

$$\begin{aligned} \text{Reject Meritocracy}_{ij} = & X\gamma + \gamma_{10}\text{Income}_{ij} + \gamma_{01}\text{Inequality}_j \\ & + \gamma_{11}\text{Inequality}_j \times \text{Income}_{ij} \\ & + r_{1j}\text{Income}_{ij} + u_{ij} \end{aligned} \tag{1}$$

NJL (p.334) offers two pieces of evidence as support for its claim: first, that the coefficient for local income inequality (that is,  $\gamma_{01}$ ) is estimated to be positive and statistically significant, and second, that the coefficient for the interaction between inequality and respondents' incomes ( $\gamma_{11}$ ) is negative and statistically significant (NJL, 334).

Neither of the two actually provide any support. First, the coefficient  $\gamma_{01}$  indicates only the effect of *Inequality* when the other variable in the interaction, *Income*, takes on the value of zero (see, e.g. Brambor, Clark, and Golder 2006, 72). Oddly, however, the nine categories of income in the Pew surveys the article employs are recoded to take on nine evenly-spaced values ranging from .21 to 1 (see Newman, Johnston, and Lown 2015b). Because the income variable never actually equals zero,  $\gamma_{01}$  is not directly interpretable. Second, Brambor, Clark, and Golder (2006, 74) specifically advise that one “cannot even infer whether  $X$  has a meaningful conditional effect on  $Y$  from the magnitude and significance of the coefficient on the interaction term.” Instead, the conditional effect of inequality is found by taking the partial derivative of Equation 1 with respect to inequality:

$$\frac{\partial \text{Reject Meritocracy}}{\partial \text{Inequality}} = \gamma_{01} + \gamma_{11} \times \text{Income}_{ij} \quad (2)$$

In short,  $\gamma_{11}$  is only part of the conditional effect; the magnitude and statistical significance depend also on  $\gamma_{01}$  and the value of *Income*.

We plot the conditional effect of *Inequality* at each value of *Income* in Figure 1 using the R package `interplot` (Solt and Hu 2015b). Contrary to the interpretation offered in NJL (p.334), this plot reveals that the coefficient for county income inequality fails to reach statistical significance at any observed level of respondent income. The article’s own results do not provide evidence for its conclusion that poorer people are more likely to reject and richer people more likely to embrace meritocracy where local income inequality is greater.

[Figure 1 about here.]

## Replication

In reproducing the above analysis, our attention was drawn to three additional issues that led us to pursue an independent replication. The most serious of these issues regards measurement of the dependent variable. To amass observations from a sufficient range of local contexts, NJL (p.330-331) combines in a single analysis data from four surveys using three different measures of its dependent variable, rejection of meritocracy. Version 1 was drawn from 2005 and 2006 surveys that asked respondents which of two statements came closest to their own opinion: “Most people who want to get ahead can make it if they’re willing to work hard” or “Hard work and determination are no guarantee of success for most people.” Those who chose the latter were coded as rejecting meritocracy. The 2007 and 2009 surveys employed did not include this item. Instead, they asked respondents to assess on a four-point agree-disagree scale two separate statements: (1) “Hard work offers little guarantee of success” and (2) “Success in life is pretty much determined by forces outside our control.” In Version 2, used with data from the 2007 survey, those who mostly or completely agreed with both statements were coded as rejecting meritocracy. Strangely, though the 2009 survey included these same two statements, respondents to that survey were coded in yet a third manner: in Version 3, those who mostly or completely agreed with statement (1) were coded as rejecting meritocracy regardless of how they responded to statement (2).

To assess whether these three very different measures are in fact comparable, we collected Pew surveys conducted between 1999 and 2012 that asked any of the items just described and plot the estimated percentage of the population to reject meritocracy according each

of three versions of the dependent variable in Figure 2. The figure reveals that Version 2 results in much lower levels of rejection of meritocracy than either of the others and that Version 3 often yields considerably higher levels than Version 1. In light of their evident lack of comparability, we conclude that pooling them in a single analysis cannot be justified.<sup>2</sup>

[Figure 2 about here.]

In our replication, we instead employ the U.S. Religious Landscape Survey (RLS) conducted by the Pew Forum on Religion and Public Life in 2007, which includes Version 1 of the dependent variable. Further, with more than ten times the number of respondents of the much smaller Pew surveys examined in NJL, the RLS was designed to provide a particularly fine-grained picture of geographic variation in attitudes and beliefs across the continental United States; it is therefore perfectly suited to providing observations across a broad range of local contexts. To make use of all of the available data, we analyze the entire sample of survey respondents, rather than only non-Latino white respondents; as NJL (p.330) notes, this should be expected to bias the results toward the expectations of the conflict theory.

The second additional issue with the NJL (p.331-332) analysis regards the contextual unit of analysis: the respondent's county of residence. Counties have long been criticized as only poorly reflecting local economic conditions. To overcome this, we use commuting zones (CZs) to define respondents' local context. CZs are aggregations of counties that represent the scope of local economic relationships across the United States. They were explicitly designed to represent where people actually live and work and overcome the unrealistic assumption that counties are economically meaningful units (Tolbert and Sizer 1996).

The final issue regards appropriate attitudinal controls. Measures of party identification, ideology, and church attendance are often added to analyses somewhat reflexively, but they

are inappropriate in a study of the relationship between income inequality and meritocracy. In both the conflict and relative power theories, the relationship between inequality and rejection of meritocracy is mediated by just these sorts of variables (on the powerful relationship between income inequality and religiosity, for example, see Solt, Habel, and Grant (2011); Solt (2014)). It is well known that controlling for variables that are causally downstream from an independent variable “messes up” the estimates of that independent variable’s effect on the dependent variable (Gelman and Hill 2007, 188). Models including these variables are presented in the appendix; they do not evince substantially different patterns, although as expected the estimated coefficients for income inequality are somewhat attenuated.

With these important exceptions, we otherwise adopt the approach employed in NJL. Local income inequality is measured using the Gini coefficient of the distribution of total family income within each CZ for the years 1996 to 2000 as calculated by Chetty et al. (2014) from the IRS Databank, which provides de-identified income and location information for all individuals living in the United States who appear on any tax form.<sup>3</sup> As in the other Pew surveys, respondents’ incomes are measured in the RLS on a nine-point scale ranging from less than \$10,000 to over \$150,000, straightforwardly coded here with values 1 to 9.

At the contextual level, we follow NJL in controlling for average income, the black share of the population, the percentage of votes won by George W. Bush in 2004, and the total population size.<sup>4</sup> At the individual level, the analyses include controls for age, education, sex, race, and citizenship. The models are estimated using multilevel logistic regression of individuals nested in CZs, with both the intercept and the coefficient for income allowed to vary across the CZs. Model 1 assesses the average effect of inequality across people of all incomes, but because both conflict and relative power theories suggest that the effect of



income inequality on meritocratic beliefs depends on an individual’s income, a cross-level interaction between these two variables is included in Model 2, as in Equation 1 above.

Figure 3 displays a dot-and-whisker plot of the results: the dots represent the estimated change in the logged odds of rejecting meritocracy for a change of two standard deviations in each variable in the model, and the whiskers represent the 95% confidence intervals of these estimates (see Kestellec and Leoni 2007; Solt and Hu 2015a). According to Model 1, which lacks a multiplicative interaction term, the average effect of the local context of income inequality across individuals of all incomes is negative and statistically significant: on average, where inequality is greater, people are *less* likely to reject meritocracy.

[Figure 3 about here.]

It is Model 2, however, that directly addresses the conflicting expectations of the conflict and relative power theories. The coefficient of income inequality is negative and the coefficient of the interaction term is positive. Both are statistically significant, but as income never takes on a value of zero and the coefficient of the interaction term is only part of the conditional effect, these results do not reveal much. Figure 4 plots conditional effects for inequality at each observed value of income. It shows that inequality’s estimated marginal effects on rejecting meritocracy are negative and statistically significant for those with incomes of up to \$50,000; they are not distinguishable from zero for those with higher incomes.

[Figure 4 about here.]

Of course, given the dichotomous dependent variable, these estimates are in logits and so their magnitudes are not easily interpretable directly. Figure 5 presents the predicted probability of rejecting meritocracy according to Model 2 across the observed range of local income inequality at various incomes when all other variables are assumed to take on

their median values. Given that assumption, those with the lowest incomes living where the context of income inequality is at the highest observed level are 20 percentage points (plus or minus 9 points) *less* likely to reject meritocracy than similarly low-income people living where inequality is at its lowest observed level. For people with incomes between \$40,000 to \$50,000 and otherwise median characteristics, the predicted probability of rejecting meritocracy declines from  $38 \pm 2\%$  to  $29 \pm 4\%$  over the observed range of inequality. For those with the highest incomes, the predicted probability of rejecting meritocracy is essentially flat regardless of the level of local income inequality. These results are contrary to the predictions of conflict theory, but consistent with those of the relative power theory.

[Figure 5 about here.]

## Conclusions

One of the most important questions underlying recent research on economic inequality and democracy is whether inequality is self-correcting or instead self-reinforcing. Newman, Johnston, and Lown (2015*a*) argues in favor of the former, more optimistic view. It contends that mere exposure to high levels of local income inequality prompt those with lower incomes to become more likely to reject an important ideological prop of persistent inequality, the idea that those who work hard can get ahead. Unfortunately, the article's own reported results do not support this conclusion, and its analysis suffers from additional issues that render even those results untrustworthy. Our independent replication using more and better data, in fact, yields the opposite result: lower-income people living where local levels of income inequality are higher are less likely to reject meritocracy than those living where the income distribution is more egalitarian.

## Appendix A: Additional Controls

Measures of party identification, ideology, and church attendance are often added to analyses somewhat reflexively, but they are inappropriate in a study of the relationship between income inequality and meritocratic beliefs. In both the conflict and relative power theories, the relationship between inequality and belief in meritocracy is mediated by just these sorts of variables. Of course, it is well understood that controlling for variables that are causally downstream from an independent variable “messes up” the estimates of that independent variable’s effect on the dependent variable Gelman and Hill (2007, 188). For the insistent, however, models including these variables are presented here in Model 1A of Figure A.1 and Figure A.2. They do not evince substantially different patterns, although as expected the estimated coefficients for income inequality are somewhat attenuated.

Objective levels of economic mobility are an additional control variable that has thus far been left out of the discussion of the causes of meritocratic attitudes, but it is, of course, directly implicated. Less obvious, perhaps, is that because economic mobility tends to decline with rising inequality (see, e.g., Andrews and Leigh 2009), it provides a cognitive explanation for any relationship between inequality and beliefs in meritocracy that may challenge both of the theories described in the text. Rather than evincing a greater psychological need to protect self-esteem in the face of personal deficiencies as the conflict theory asserts (see, e.g., Newman, Johnston, and Lown 2015a, 329) or the more complete cultural domination of the well-off as the relative power theory maintains (see, e.g., Solt 2012, 704), beliefs in meritocracy in more unequal contexts may instead simply reflect a correct recognition of the greater difficulty of advancing in a more sharply stratified society.

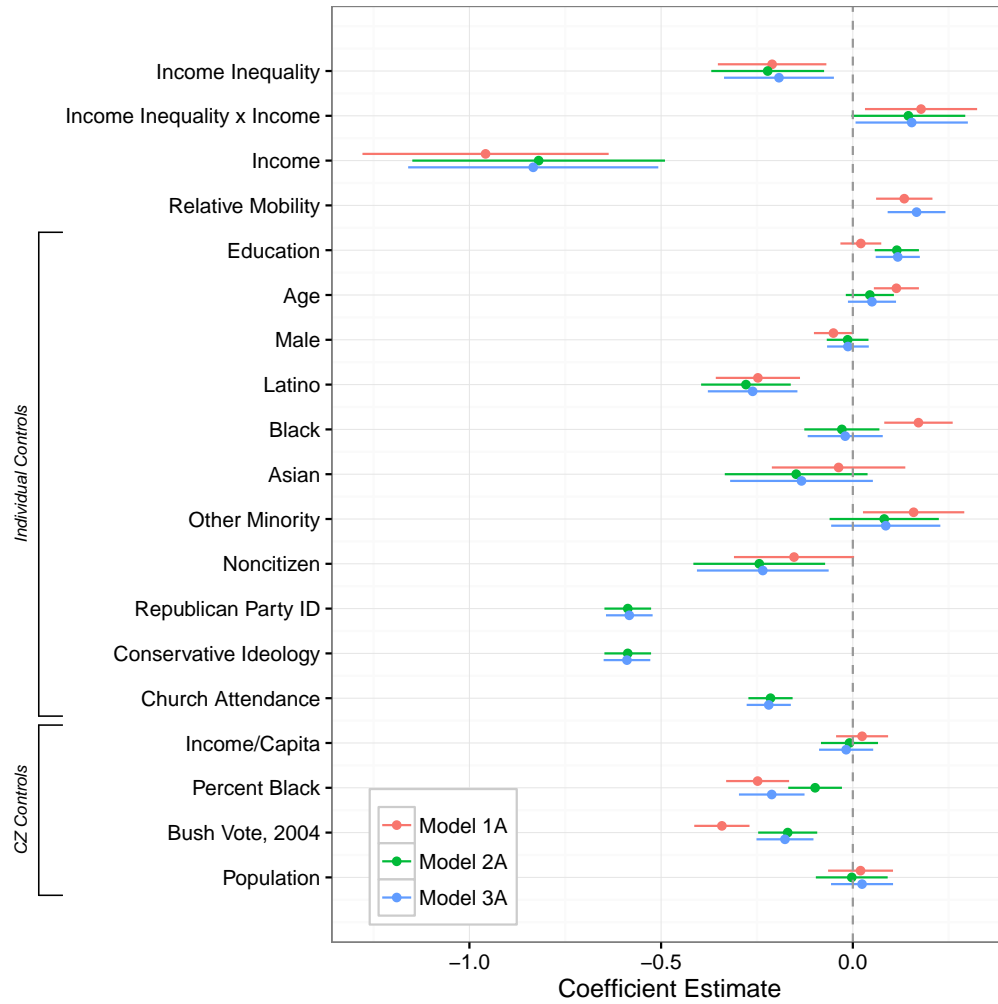
For economic mobility, we use Chetty et al.’s (2014, 1554) data on relative intergenerational mobility, which provides the best available information of the extent to which “a person’s chances of success depend little on his or her family background.” It is measured as the relationship, in each CZ, between parents’ rank in the national income distribution when their children were in their late teens and the rank of those children when they are approximately age 30. The median respondent lives in a CZ with a score of .34 on this variable, that is, a 10 percentile increase in parents’ incomes is associated with only a 3.4 percentile increase in childrens’ incomes. Economic mobility ranges from .07 to .51 in this dataset.

The results of Model 2A, which adds relative mobility to Model 2, and Model 3A, which adds it to Model 1A, lend no support to cognitive hypothesis suggested above: it is those living in context of *greater* relative mobility who are more likely to reject meritocracy, and the results regarding the effect of income inequality are essentially unchanged.

The extent to which people are segregated by income in a locality may also be thought to affect the relationships tested here. The Chetty et al. (2014) data include three measures of income segregation: overall segregation, the segregation of poverty, and the segregation of affluence. We added each of these measures to Model 3A of Figure A.1. The results are shown in Figure A.3 and Figure A.4. Regardless of the measure employed, income segregation has no discernable effect on meritocratic beliefs. As greater residential segregation by income is a well-known result of higher income inequality, with the higher income households increasingly moving away from those with lower incomes and poorer households being increasingly unable to afford to live in those neighborhoods considered most desirable by richer ones, it is not

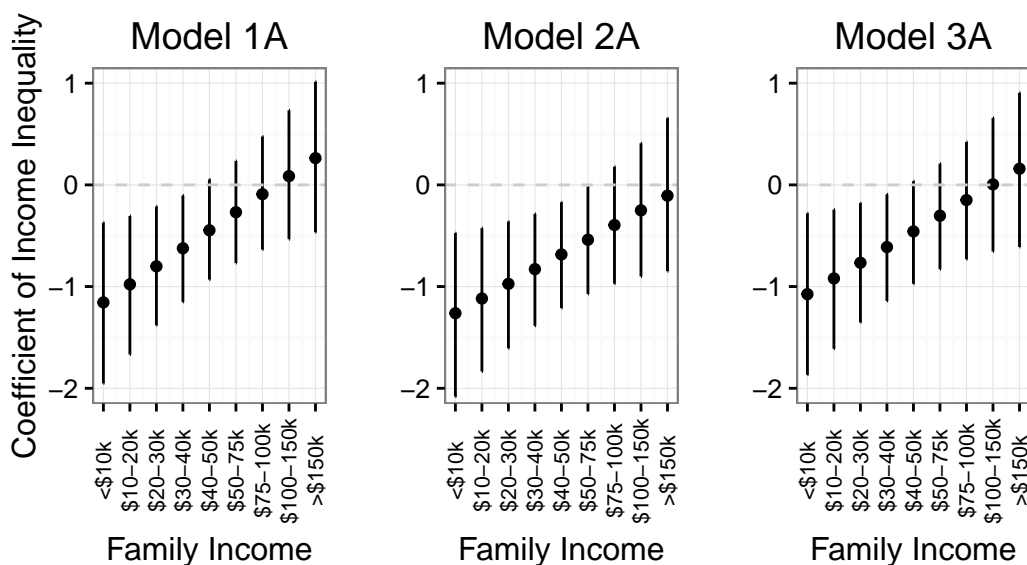
surprising that the estimated effects of income inequality are somewhat smaller when this variable is included. The conclusions reached in the text, however, are still supported.

Figure A.1: Predicting Rejection of Meritocracy With Additional Controls



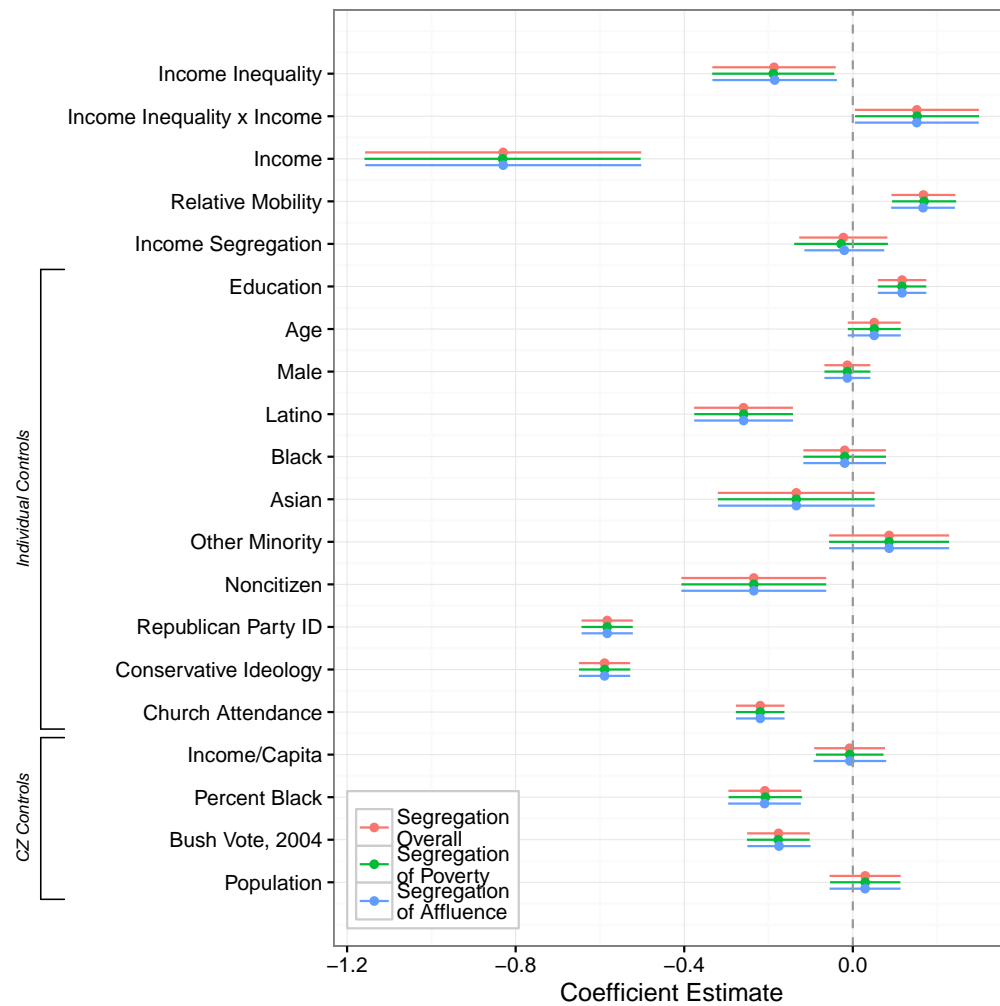
*Note:* The dots represent estimated change in the logged odds of rejecting meritocracy for a change of two standard deviations in the independent variable; the whiskers represent the 95% confidence intervals of these estimates. Multilevel logistic regression analyses of 28,615 individual respondents living in 676 commuting zones.

Figure A.2: Estimated Coefficients of Income Inequality by Income on Rejection of Meritocracy



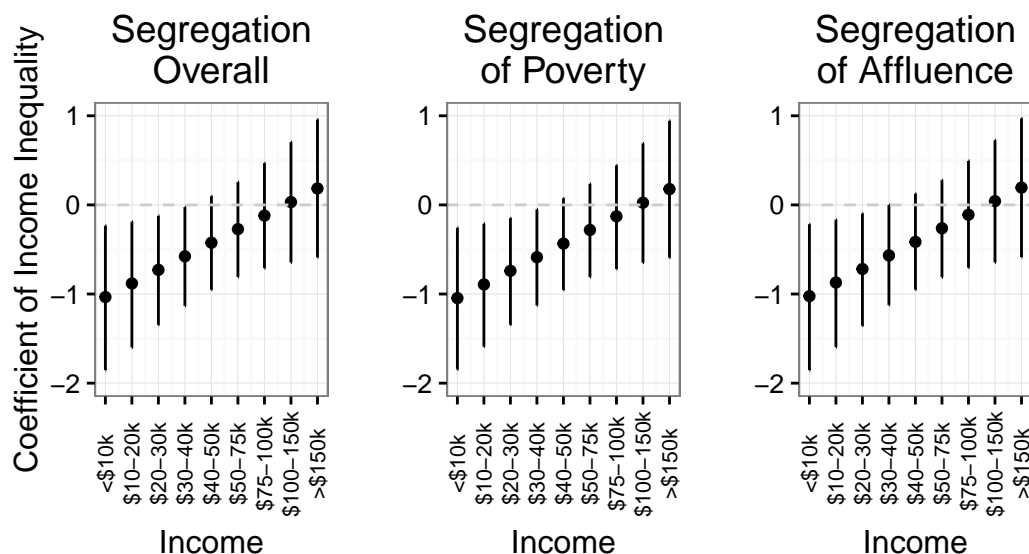
*Source:* Analyses presented in Figure A.1. The dots represent estimated coefficient of income inequality within respondents' commuting zones on their belief in meritocracy for all values of respondent family income; the whiskers represent the 95% confidence intervals of these estimates. In all three models, these estimates are negative—indicating a lower probability of rejecting meritocracy—and statistically significant for those with lower incomes, while the coefficients for those with higher incomes are not distinguishable from zero.

Figure A.3: Predicting Rejection of Meritocracy Controlling for Income Segregation



*Note:* The dots represent estimated change in the logged odds of rejecting meritocracy for a change of two standard deviations in the independent variable; the whiskers represent the 95% confidence intervals of these estimates. Multilevel logistic regression analyses of 28,615 individual respondents living in 676 commuting zones.

Figure A.4: Estimated Coefficients of Income Inequality by Income on Rejection of Meritocracy



*Source:* Analyses presented in Figure A.3. The dots represent estimated coefficient of income inequality within respondents' commuting zones on their belief in meritocracy for all values of respondent family income; the whiskers represent the 95% confidence intervals of these estimates. In all three models, these estimates are negative—indicating a lower probability of rejecting meritocracy—and statistically significant for those with lower incomes, while the coefficients for those with higher incomes are not distinguishable from zero.

## Notes

<sup>1</sup>We were not able to reproduce the auxiliary analysis on class consciousness presented in Table 3 at all, however, as the number of random effects to be estimated in the model, 1322, exceeds the number of observations in the data, 1067 (see Newman, Johnston, and Lown 2015*a*, 336). We restrict our focus here, though, to the article’s main analysis of the rejection of meritocracy as presented in Table 1, Model 1 (“White Rs”).

<sup>2</sup>For another example of uncritically mixing these three incomparable measures, see Newman (forthcoming). Of the five Pew surveys listed in Table 1 and pooled in the article’s analysis, Measure 1 is used in the 2011 Political Typology Surveys, Measure 2 is used in the 2009 and 2012 Values Surveys, and Measure 3 is used in the 2008 and 2012 Middle Class Surveys.

<sup>3</sup>This measure is not perfect. Its welfare definition is income after government transfers but before taxes. Because much redistribution occurs through the tax code, an after-tax measure would be preferable; unfortunately, virtually no data on the distribution of after-tax income at any geographic scale below the national level is available for the United States (see, e.g., Kelly and Witko 2012, 420). Further, it examines differences in incomes across families, which means those without children are excluded. It is based on tax records, so it suffers from potential underreporting, particularly among those with very high incomes, though because the topcode for incomes is \$10 million dollars, the downward bias is likely smaller than that found in similar Census data which is topcoded at considerably lower amounts. Finally, it measures inequality about a decade before the Pew survey; income distributions change only quite slowly over time, but nevertheless one might wish it were more temporally proximate. Despite these shortcomings, it remains the best data available on income inequality within commuting zones.

<sup>4</sup>Additional analyses adding controls for two contextual variables not considered in NJL, objective economic mobility and residential income segregation, are presented in the Appendix. The results of these analyses are substantively similar to those presented in the text.



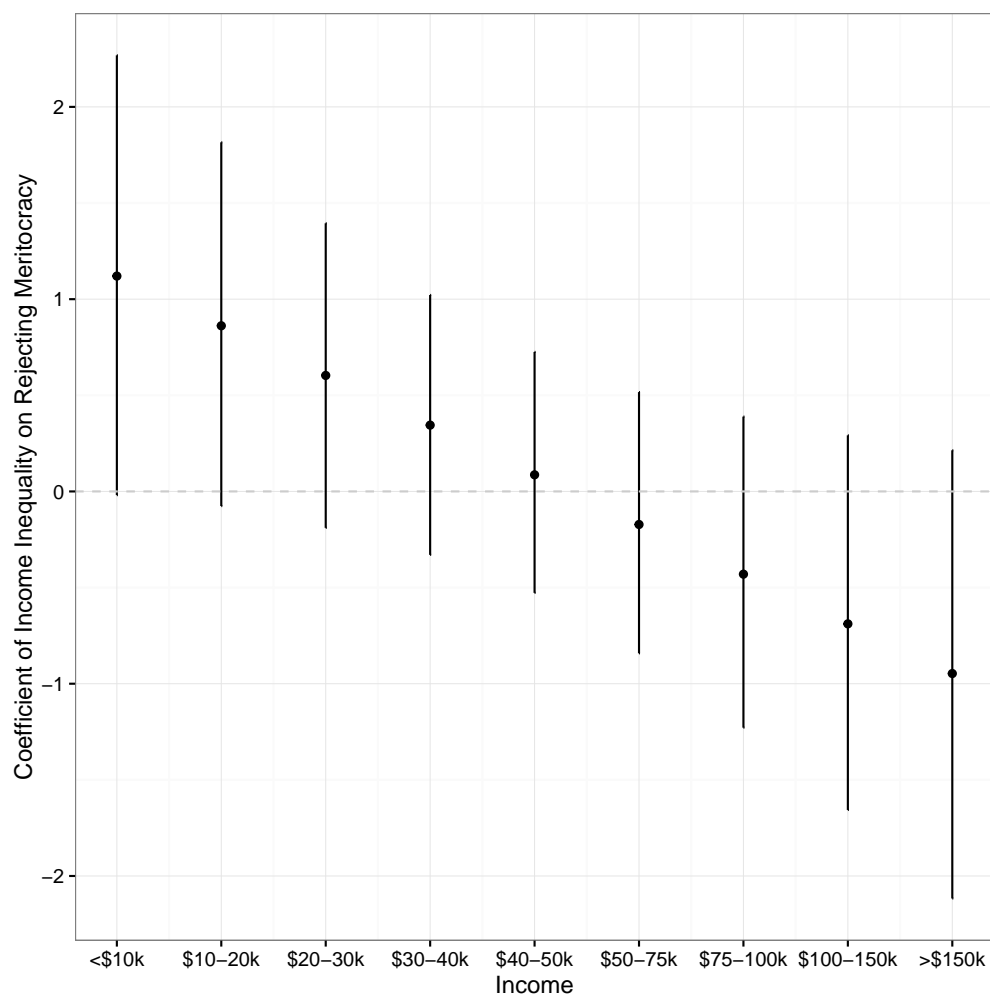
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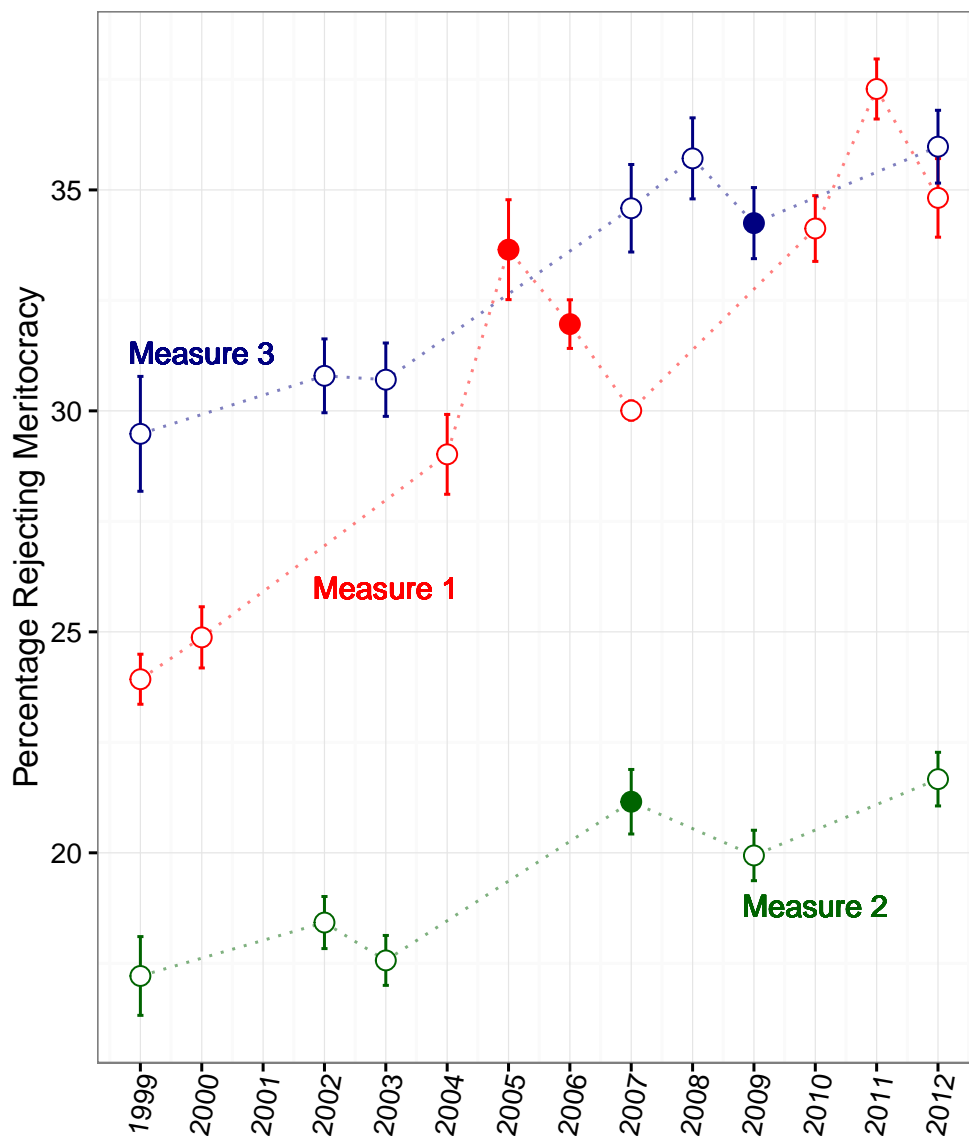
## Figures

Figure 1: Logit Coefficients of Local Income Inequality on Rejection of Meritocracy by Income, Newman, Johnston, and Lown (2015a), Table 1, Model 1, From Replication Data



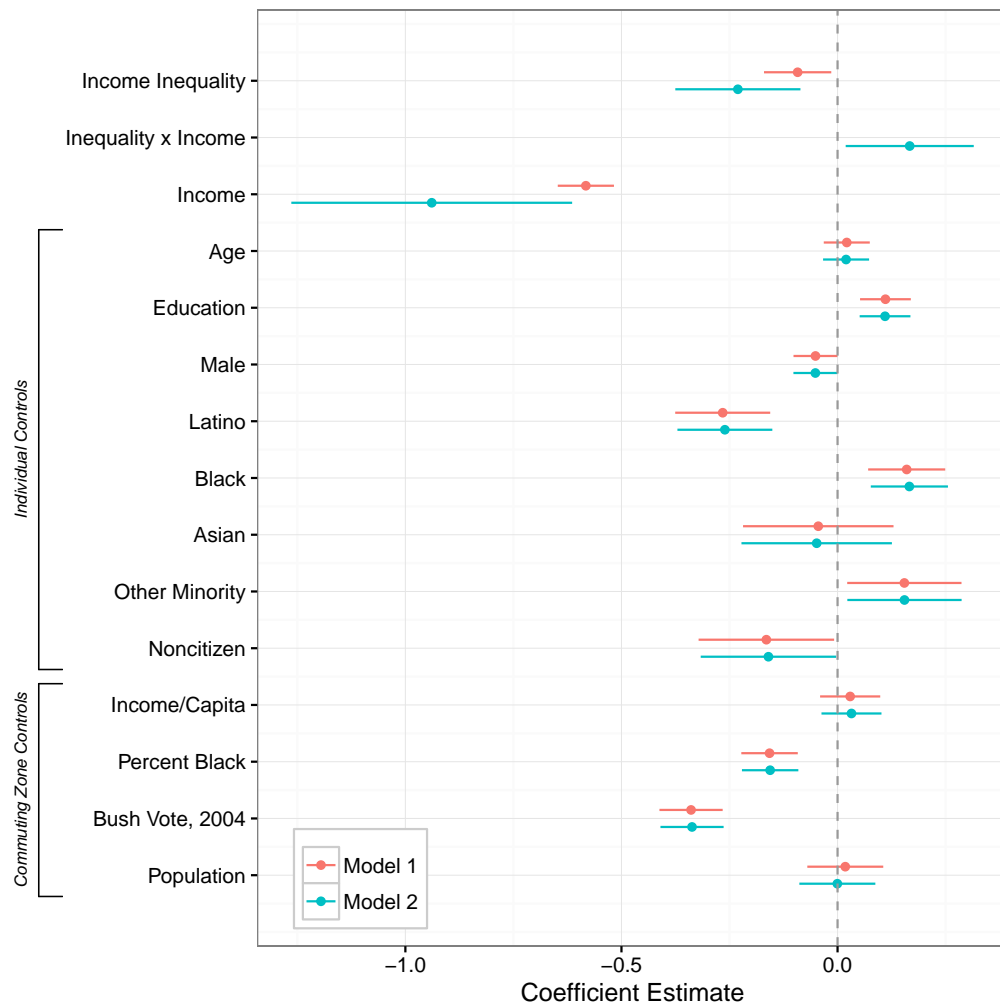
*Notes:* The dots represent coefficients of income inequality within respondents' county on their rejection of meritocracy for all values of respondent income, estimated from the data and model provided in Newman, Johnston, and Lown (2015b); the whiskers represent the 95% confidence intervals of these estimates. Contrary to the interpretation offered in Newman, Johnston, and Lown (2015a, 334), the coefficient for county income inequality fails to reach statistical significance at any observed level of respondent family income.

Figure 2: Comparing Three Measures of Rejection of Meritocracy Pooled by Newman, Johnston, and Lown (2015a)



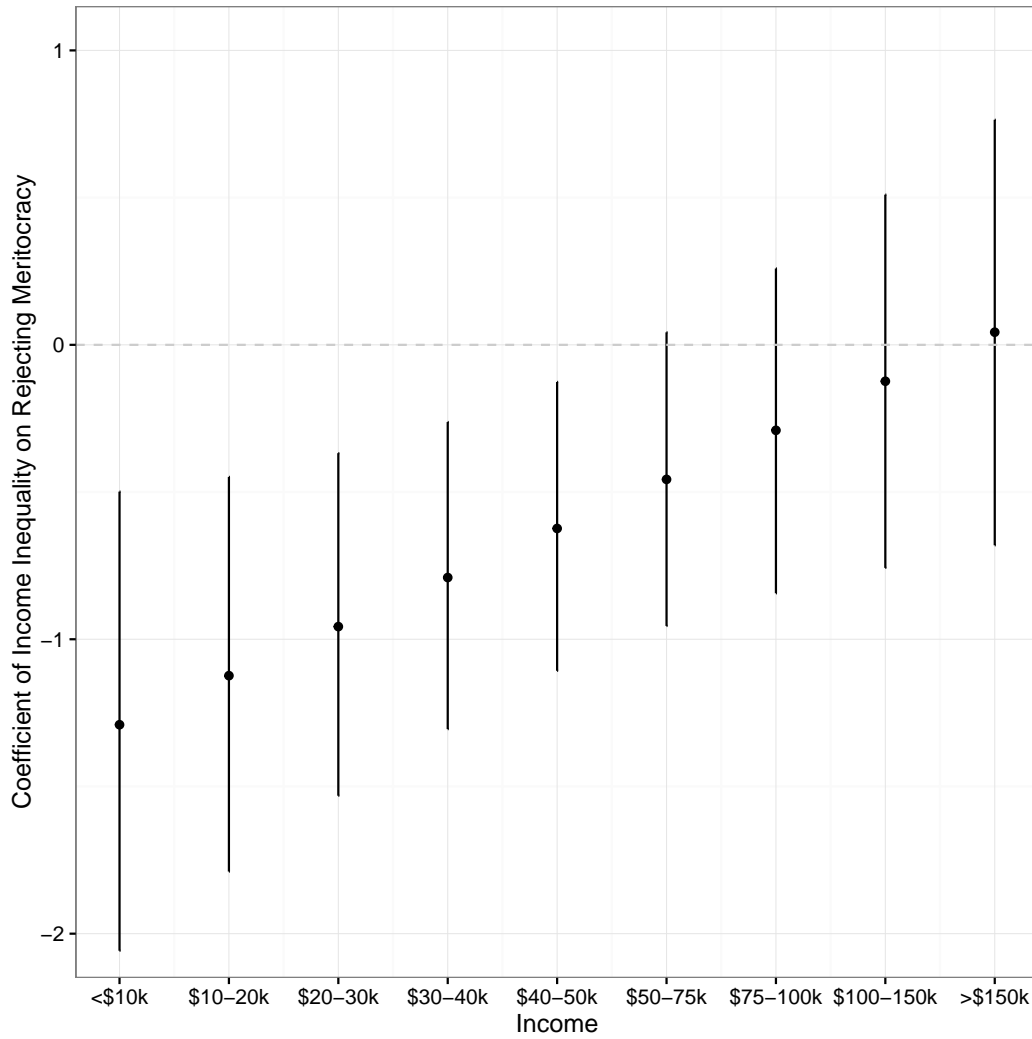
*Notes:* The analyses presented in Table 1 of Newman, Johnston, and Lown (2015a, 333) were conducted on pooled observations with the dependent variable, rejection of meritocracy, measured in one of three different ways (see Newman, Johnston, and Lown 2015a, 331). Here, solid circles represent the data used by Newman, Johnston, and Lown (2015a); hollow circles represent data in other available Pew surveys. The whiskers are 95% confidence intervals for each estimate. Plotting the weighted percentage of respondents to reject meritocracy by each of these measures reveals that the second measure results in much lower levels of rejection of meritocracy than either of the others and the third often yields considerably higher levels than the first. In light of the evident lack of comparability of these three measures, pooling them into a single analysis cannot be justified.

Figure 3: Predicting Rejection of Meritocracy



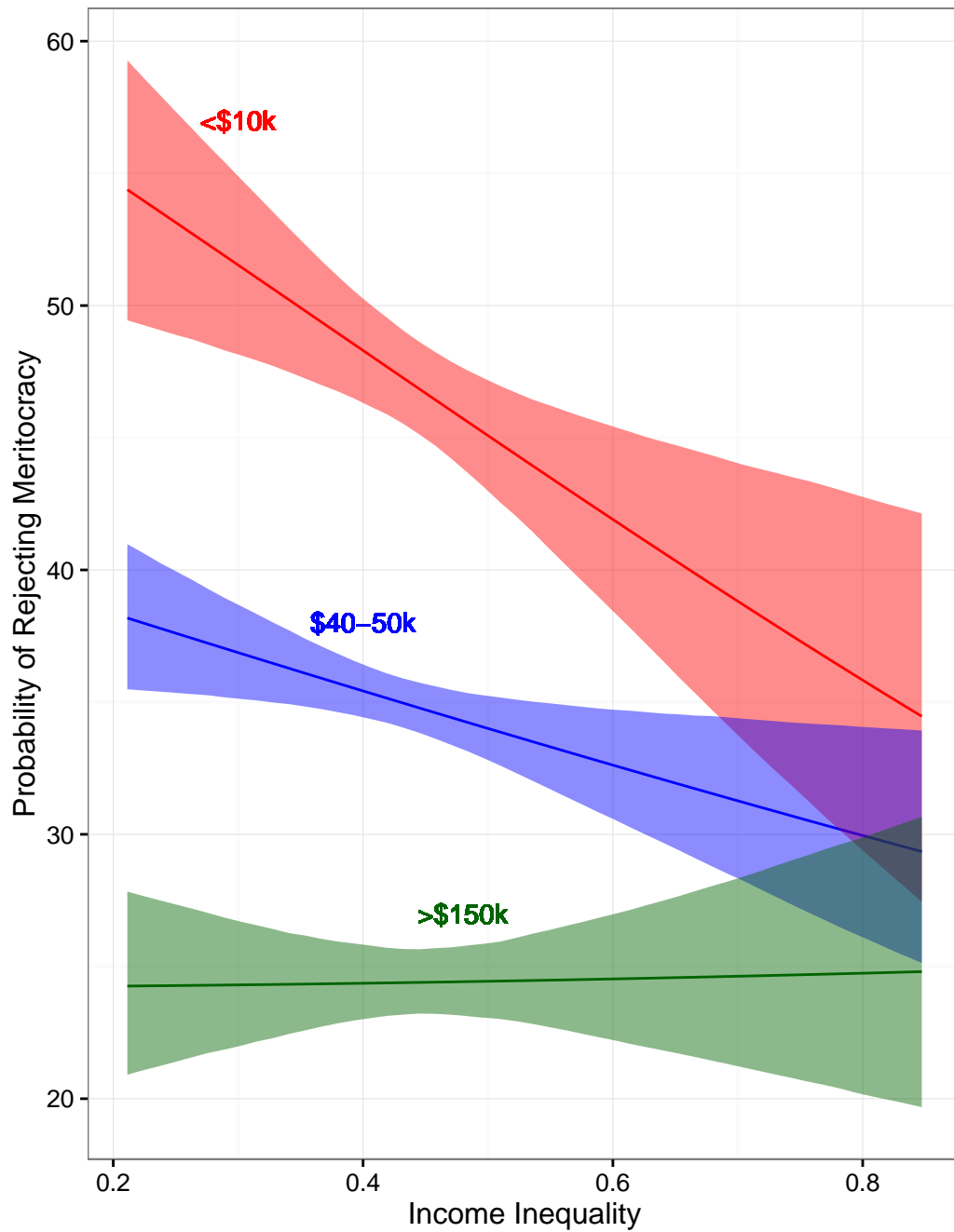
*Note:* The dots represent the estimated change in the logged odds of rejecting meritocracy for a change of two standard deviations in the independent variable; the whiskers represent the 95% confidence intervals of these estimates. Multilevel logistic regression analyses of 28,633 individual respondents living in 691 commuting zones.

Figure 4: Estimated Coefficients of Income Inequality by Income



*Source:* Model 2, as presented in Figure 3. The dots represent estimated coefficients of income inequality within respondents' commuting zones on their rejection of meritocracy for all values of respondent family income; the whiskers represent the 95% confidence intervals of these estimates. The estimates are negative and statistically significant for those with lower incomes, while the coefficients for those with higher incomes are not distinguishable from zero.

Figure 5: Predicted Probability of Rejecting Meritocracy by Income and Level of Inequality



*Source:* Model 2, as presented in Figure 3. Solid lines represent predicted probabilities and shaded regions represent the 95% confidence intervals of these predictions. The predicted probabilities were generated by fixing all other variables at their median values.