Identifying Preferences for Equal Educational Opportunity, Income, and Income Equality

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Abstract

Revealed preferences for equal educational opportunity may be due to beliefs that opportunities increase societal income or income equality. To isolate preferences for those goods, we implement an online discrete choice experiment using social statistics generated from true variation among commuting zones. We find that, *ceteris paribus*, the average income that individuals are willing to sacrifice is (i) $5,208 dollars to increase higher education (HE) enrollment by 1 standard deviation (14%); (ii) $1,408 dollars to decrease rich/poor gaps in HE enrollment by 1 standard deviation (8%); (ii) $3,298 to decrease the 90/10 income inequality ratio by 1 standard deviation (1.66). **JEL**: D31, D63, J62.

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1 Introduction

Consider a policy decision between allocating governmental funds to an educational intervention that increases college access for low-income students, a social security fund that increases income for low-income retirees or a tax-cut program to increase economic growth. In this example, the education intervention increases educational opportunity, social security increases income equality and tax-cuts increase societal income. The policy choice, therefore, has effects on different social dimensions. Supposing the social planner knows the actual costs and effects for each of the policies, two additional pieces of information are needed to determine which of the policies should be pursued. First, we need to know how much citizens value each of the societal variables. Second, in order to make comparisons across different social goods, we need common units of measurement. With this information, it would then be possible to quantify how much societal income individuals would be willing to spend to improve each social value.

In this paper, we are concerned with individual preferences for equal educational opportunity (EEO), and how those preferences relate to preferences for other societal goods, including income and income equality. Traditionally, data about preferences for distributions of social goods have been collected from opinion surveys, such as the General Social Survey in the United States and the World Values Survey at the international level. Meanwhile, the academic community has focused mostly on understanding preferences for equality in income and has not, to our knowledge, considered multi-dimensional preferences for distributions of other variables, such as educational opportunity (D'Ambrosio and Clark, 2015).

Information regarding individual preferences for multiple social values is not easily obtained from traditional opinion surveys due to two sources of omitted variable bias. First, preferences for equal educational opportunity can be confounded by preferences for either efficiency or equality in income. For example, an individual who expresses an interest in greater equal educational opportunity may believe that equaliz-

ing opportunity has positive spillovers on both efficiency and income equality and is *for those reasons* desirable and not desirable *per se*. Second, individuals make unobserved assumptions about the expected costs to society that a preferred distribution of opportunity or income would require. For example, respondents may prefer equal income distributions, all else constant, but because they believe that equality distorts incentives, they also expect societal costs to be large, and therefore their revealed preferences for equal income will appear attenuated (Piketty, 1995).

To recover preferences, we implement a survey experiment that identifies social preferences for EEO, efficiency, and income equality. Survey respondents are asked to participate in a discrete choice experiment in which they select between one of two societies. For each society a respondent sees, societal variables are randomly assigned using four statistics: societal income (measured as average median family income), income inequality (measured as the 90/10 income ratio), average education (measured as the enrollment rate in higher education) and educational opportunity (measured as the difference in higher education enrollment rates between children from families in the 90th and 10th income percentiles). Variation for these statistics is derived from true variation among commuting zones in the United States, using Census data and the education mobility data from the Chetty et al. (2014) project at `http://www.equality-of-opportunity.org/`. Because societal statistics are randomly assigned, we avoid biases due to beliefs about the relations among societal values. Moreover, because the level of societal income is also randomly assigned, individual beliefs about the costs of equality are no longer unobserved. With these data, we obtain measurements of how much society's average income individuals are willing to sacrifice in order to improve other social values, thus providing a common metric for making comparisons across different domains.

We find that (i) individuals are willing to decrease average income by $5,208 dollars of average income to increase enrollment in higher education by 1 standard deviation

(SD) (14%); (ii) individuals are willing to exchange $1,408 dollars of average income to decrease gaps in EEO by 1 SD (8%); (iii) individuals are willing to exchange $3,298 dollars of average income to decrease the 90/10 income inequality ratio by 1 SD; (iv) we also evaluate "Rawlsian trades"—so named because of the (controversial) distributive priority Rawls gives to EEO over income equality in his theory—and find that individuals are willing to increase gaps in educational mobility by 2.34 SDs to reduce the 90/10 income ratio by 1 SD.

Using additional collected information, we also identify differences based on political affiliation. While it is well known that right-leaning voters care less about equality (Kuziemko et al., 2015), it is not known whether this preference is due to an indifference to equality or differences in expected societal costs. We find that Republicans have nearly lexicographic preferences for average income, meaning that they are unwilling to trade any units of income for equality in either dimension. Thus, Republicans are not equality averse because of perceived costs but because societal income is the most important variable in their social welfare functions. We do, however, find overlap among partisans, as both Democrats and Republicans are willing to trade meaningful quantities of average income (over $2,500) to increase enrollment in higher education by 10%. These results suggest that, between parties, there is an overlapping consensus with respect to increasing average levels of education and a large chasm with respect to equalizing educational opportunities or income.

Our primary result is that US citizens are willing to exchange meaningful amounts of average income for other social goods, including overall levels of education (which is often viewed purely as a good that is instrumental for economic growth) and reductions in inequality. Second, our results help clarify some confusion about the relation between EEO and equality of income. When considered in isolation, individuals may indicate greater preferences for EEO relative to equal income; however, our results indicate that some of this rank-ordering is attributable to the belief that EEO is a "packaged good,"

with important perceived spillovers in other areas. When considered simultaneously, respondents are willing to pay over twice as much for equivalent reductions of income inequality relative to equal opportunity differences. These results suggest that if there is a public policy choice between a social security fund or an educational intervention, all else constant, the preferred policy choice would be income transfers.

The next section reviews the most relevant background literature, while section 3 provides a theoretical framework. Section 4 details the experiment that was implemented. Section 5 describes the data and the econometric methodology, and section 6 provides and discusses the results.

2 Background Literature

In general, academic scholarship has focused on preferences for income equality and not equal educational opportunity (D'Ambrosio and Clark, 2015). On the topic of preferences for income equality, D'Ambrosio and Clark (2015) classify academic scholarship into two fields: comparative and normative. In the comparative case, survey respondents think of themselves as the relevant reference group and consider whether their place in a specific distribution of income is better or worse than alternative distributions. In the normative case, the relevant reference group is an ideal or normative standard; therefore, survey respondents consider whether a distribution of income is better or worse relative to the standard and not with respect to the individual's own position.

The work conducted here is most closely related to the normative case. In this branch of research there are two approaches. One approach estimates empirical correlations between a society's level of income equality and its members' observed level of well-being. Contextual factors—such as credit constraints Benabou (2000); observed social mobility Alesina, Stantcheva and Teso (2017); Piketty (1995) and expected so-

cial mobility Alesina and La Ferrara (2005); Benabou and Ok (2001)—can then be used to explain preferences for distributions of income. D'Ambrosio and Clark (2015) provide a summary of such research around the world, and results differ depend on the data source, country of analysis and the inequality metric used. The heterogeneity in these results is not surprising, given that different groups (e.g., socioeconomic, political) residing in different contexts have different beliefs about the relevance of income inequality (Grosfeld and Senik, 2010).

The second approach uses experiments to estimate individuals' willingness to pay for equality. For example, Johansson-Stenman, Carlsson and Daruvala (2002) provide individuals with hypothetical societies for their future grandchildren and randomly set a uniform distribution of income. They find high levels of inequality aversion in their sample. Amiel and Cowell (1999) and Pirttilä and Uusitalo (2010) use a leaky bucket experiment, which imposes a societal cost to redistribute income, and find a wide range of inequality aversion. D'Ambrosio and Clark (2015) provide an extensive overview of experimental evidence about inequality aversion.

Inequality aversion varies among political partisans. For instance, in political science and economics, there is considerable evidence that liberals and conservatives have what appear to be fundamental differences in preferences for income equality. Data from the GSS show that Democrats are twice as likely as Republicans to favor governmental action to remedy inequality.[1] Data from the PEW Center show that Republicans are twice as likely as Democrats to say that a person is rich because of his or her own efforts and nearly three times as like to say that a person is poor because of lack of effort.[2]

Researchers have also shown that individuals respond to information differently based on party affiliation and political ideology. Kuziemko et al. (2015) randomly provide accurate information about levels of inequality in the US to a sample of respondents

[1]NORC Issue Brief - "Inequality: Trends in Americans' Attitudes."

[2]Pew Research Center online article - "Why people are rich and poor: Republicans and Democrats have very different views."

through Amazon's Mechanical Turk (mTurk) interface and find that this information changes how much individuals care about inequality, but does not change support for redistribution policies. They also demonstrate that liberals care more about inequality overall, and that the effect for liberals of presenting information to respondents is larger. Alesina, Stantcheva and Teso (2017) provide individuals with accurate information about social mobility, and find that liberal respondents increase their support for redistribution when presented pessimistic data about mobility, while conservative respondents are inelastic to information.

Our study fills two gaps in the research literature. First, we obtain estimates for how much survey respondents are willing to trade average family income for EEO and equal income jointly. That is, respondents make decisions that require trade-offs between both average income as well as the joint distributions of equal educational opportunity and income equality. Whether individuals care about equal opportunity as means to other ends (such as income equality) or as an end in itself is not known. Our model converts preferences for these two outcomes into a common willingness to pay metric; we find that preferences for equal income dominate preferences for EEO.

Second, while it is known that liberals and conservatives have different preferences for equality, it is not known whether preferences for equal opportunity and income are weighted differently based on political affiliation. Moreover, in general, it is not known whether conservatives' relative indifference to inequalities in different social goods is due to expectations about costs. We provide willingness to pay estimates for both EEO and income according to political affiliation and show that Republican voters' willingness to pay for equality of income and opportunity is close to zero, and that preferences for equal income dominate preferences for equal opportunity for both Democrat and Republican voters.

3 Theory

3.1 Equal Educational Opportunity

The goal of this paper is to distinguish preferences for equal educational opportunity (EEO) from preferences for society's overall level of income, average education, and income equality. Theoretical interest in societal income and income equality are commonplace. However, characterizing and motivating an interest in EEO is worth more attention. We define EEO as the absence of correlation between the income class of an individual's parents and the probability of that individual obtaining at least a college degree; equality of opportunity is greater when the correlation is lower. Under certain conditions, such a definition of EEO converges with the traditional notion of fair equality of opportunity articulated by Rawls in *Theory of Justice* and in political philosophy more broadly (Arneson, 1999; Brighouse and Swift, 2008; Rawls, 2001, 2009). This conception of EEO is also widely used in empirical applications. For example, along with income mobility, Chetty et al. (2014) measure equality of opportunity as the probability of college attendance conditional on parental income. In other work, Chetty et al. (2017) demonstrates that conditioning on parental income results in substantial variation across institutions of higher education in the probabilities of upward mobility.

Debate about whether or not public policy should promote EEO or income equality is salient in both public policy and political philosophy. As is well known, tuition-free higher education was a prominently featured populist campaign issue during the Democratic primaries of 2016. As of April, 2016, a Gallup survey of 2,024 adults found that 47% supported tuition-free higher education.[3] Less reliable polling data indicate this support has grown.[4]

In political philosophy, the origin of the debate can be traced back to Rawls' *Theory*

[3]See "Americans Buy Free Pre-K; Split on Tuition-Free College."

[4]See "Is college worth it? Americans see it as a good investment, Bankrate survey finds"; and "Poll Finds Americans Across Party Lines Support Free College."

of Justice. In the Rawlsian schema, the two principles of distributive justice are fair equality of opportunity and the difference principle; the difference principle is lexically subordinate to the fair equality principle, meaning that the conditions of fair equality are to be satisfied before attention is paid to the difference principle. For our purposes, we can think of the difference principle as any preferred distributive principle, such as equality of income. Thus, for Rawls (2009, 2001), it is allowable to trade equality of income for EEO.

Against this view, Arneson (1999, 2013) has argued that equal opportunity principles have a meritocratic bias. That is, equal opportunity principles that eliminate barriers based on social class (and other observed characteristics) leave open barriers on the basis of ability. Because discrimination on the basis of ability has no greater moral justification than discrimination on the basis of social class, equal opportunity principles need to be given either lower distributive priority or discarded. Other philosophers have offered various reasons to promote EEO. Each argument has a common feature, which is to identify a benefit promoted by EEO that is of greater value than the "consumption interest" (Taylor, 2004, p.337) promoted by distributing shares of income. For Shields (2015), the good is autonomy; for Shiffrin (2003), the good is democratic equality; and for Taylor (2004), the good is self-realization. Despite the ongoing disagreement among political theorists, US citizens, and policymakers, our analysis is the first to conduct an empirical test to determine whether individuals prioritize EEO or income equality.

3.2 Social Welfare and Budget Constraints

Given an interest in multiple social goods, we wish to estimate Social Welfare Function (SWF) iso-welfare curves, which can then be used to calculate marginal rates of substitution (i.e., willingness-to-pay statistics) for these goods. Here we characterize different welfare outcomes based on preferences for EEO and a society's budget constraint. The panel (a) in Figure 1 shows the SWF iso-welfare curve characterizing the preferences

for EEO, on the one hand, and efficiency (societal income) on the other. The figure also includes two possible budget restrictions that link EEO and efficiency, which could be thought of as the trade-offs resulting from undertaking a public policy decision. The SWF curve in the figure assumes that society would be willing to trade losses of efficiency for gains in EEO. The empirical shape of the SWF curve is unknown; therefore, the goal of this research is to characterize the shape of the SWF iso-welfare curve for different societal variables using empirical data.[5]

[Insert Figure 1 Here]

The consequences of the SWF shape will depend on the budget restriction faced by society. If budget restriction 1 in Panel (a) of Figure 1 is in place, then the available public policy projects improve EEO and efficiency jointly, so they should be implemented. Budget restriction 1 could characterize, for example, low cost projects that increase the opportunities of poor children whose talents are "wasted." However, the more interesting arguments about EEO require a trade-off between efficiency and equality (Hoxby, 1998; Rawls, 2009).[6] A trade-off between efficiency and EEO is represented by budget constraint 2, an example of which is a public policy that provides education to low-income students, but also introduces taxation (Lara, 2016; Alesina, Stantcheva and Teso, 2017). Under budget constraint 2, the optimal societal decision will depend on the shape of the SWF curve. In particular, the decision of whether to pursue the policy will depend on whether the society moves into the space above the iso-welfare curve, indicated by the movement from A to B in the Panel (b) of Figure 1. From a social planner perspective, the optimal decision rule would be to choose the point where the SWF iso-welfare curve is tangent to the budget restriction 2. In sum, differ-

[5]Figure 1 can be used to understand trade-offs between other social values as well.

[6]Following Hume, Rawls argues that trade-offs resulting from scarcity are the basis upon which questions of distributive justice arise. "[T]he circumstances of justice obtain whenever persons put forward conflicting claims to the division of social advantages under conditions of moderate scarcity. Unless these circumstances existed there would be no occasion for the virtue of justice, just as in the absence of threats of injury to life and limb there would be no occasion for physical courage," (Rawls, 2009, p.110).

ent shapes of the SWF imply different preferences for trade-offs and therefore different optimal decisions.

4 Experimental Design

We now describe the design of the online experiment. We begin with a description of the survey experiment and the definitions of the different variables to be used.

4.1 Discrete Choice Experiment

We use a discrete choice experiment (DCE) to randomly assign societal values, along four dimensions, to two different hypothetical future societies. Between these two societies, respondents must decide which one is preferable.[7] The four dimensions isolated are (1) societal income; (2) income inequality; (3) average education; and (4) EEO.

The survey experiment consists of two sections. In the first, we teach respondents about the societal variables and ask diagnostic questions to ensure comprehension. Respondents are first presented with descriptive information about the four variables and asked a series of comprehension questions to determine whether they understand the data. Regardless of whether respondents answer the comprehension questions correctly, the survey tells them the correct answer.[8]

In the second section, respondents are given information about contemporary US statistics in each of these dimensions. In the discrete choice experiment, respondents

[7]Discrete choice experiments, or conjoint analysis, are a method for eliciting and estimating social preferences for discrete outcomes. The methods are widely used in consumer research (Green and Srinivasan, 1978), health care and health economics (Louviere, 1988; Ryan and Farrar, 2000; Ryan et al., 2000), energy policy (Álvarez-Farizo and Hanley, 2002; Poortinga et al., 2003), and immigration (Hainmueller and Hopkins, 2014, 2015).

[8]Diagnostic questions about how income equality and equal opportunity are defined in the experiment were answered correctly by 79.4 and 61.2 percent of respondents, respectively. A final diagnostic question asked respondents the difference between two societies in a simulation of the survey they were about to take; this question was answered correctly by 71.1 percent of respondents. In Appendix A: Survey Platform, we include screen shots of the survey platform for variables description (Figure A.1, diagnostic questions (Figures A.2, A.3, and A.4), and an example of the survey questions (Figures A.5 and A.6).

are then asked to choose between two hypothetical future societies, A and B, in which values for each of the four variables are randomly assigned to each society. For example, Societies A and B may both be assigned the same level of income, but Society A has high levels of income inequality while Society B has low levels of EEO. Respondents choose which bundle of randomly assigned values are optimal, according to their own welfare criteria.

Two additional features of the DCE can be highlighted. First, after respondents are presented with descriptive information and diagnostic questions, they are given four versions of the choice experiment, in which societal values are randomly assigned for each new question. Giving respondents multiple questions is more cost effective than introducing the survey to new respondents an equivalent number of times. Standard errors are therefore clustered at the respondent level. Second, to minimize primacy and recency effects, the four societal attributes were presented in a randomized order across respondents (Hainmueller, Hopkins and Yamamoto, 2014).

4.2 Social Welfare Variables Construction

As explained, respondents are presented with information about a society's overall level of income and human capital development, as well as levels of income and educational equality.[9] The variables that are presented to survey respondents are constructed based on means and standard deviations from US commuting zones (CZ) using data made available by Chetty et al. (2014) from the `Equality-of-Opportunity.org` project. Respondents are asked to choose values that conform to different combinations of CZ-level family income per capita, income inequality, level of higher education and educational mobility. Effectively, respondents are randomly assigned CZ descriptive characteristics and are asked which bundle of descriptive statistics is most desirable.

[9]Giving respondents information on the current values of US statistics may induce anchoring bias. However, we felt the risks were outweighed by the benefits of ensuring respondents had a reference point for the statistics, upon which they could make comparisons.

The primary statistics presented to respondents are household income per capita, the percentage of persons aged 25 and above with at least a Bachelor's degree, the ratio of average income of the 10% richest to the 10% poorest (90/10 income inequality ratio), and the equivalent percent of children from the 90th income percentile who attended a 4-year college program by age 21 minus the percent of children from the 10th percentile.[10] To generate the values that will be presented to respondents, we take values for each variable at the national level and set those as mid-points. For variation, we calculate the CZ-level standard deviations using comparable statistics from Chetty et al. (2014) and the `Equality-of-Opportunity.org` project. We then add/subtract one-half and one times the respective standard deviations to the average values. Therefore, lowest values are the average minus one times the standard deviation, while highest values are the average plus one times the standard deviation, for a total of 5 values per variable. For purposes of clarification, we modify the values to put them into units that are more easily interpretable. These values constitute the final set of variables that are assigned to respondents and are shown in Table 1.[11]

[Insert Table 1 Here]

5 Data and Methods

5.1 Data

Data for the survey are collected using Amazon's Mechanical Turk (mTurk) interface. Currently, mTurk is an established on-line platform that can be used to carry out social and survey experiments (Kuziemko et al., 2015; Berinsky, Huber and Lenz, 2012; Horton, Rand and Zeckhauser, 2011; Paolacci, Chandler and Ipeirotis, 2010; Huff and Tingley, 2015). Berinsky, Huber and Lenz (2012) show that mTurk samples are

[10] Additional details about these data and sources can be found in Appendix B: Variables Construction for DCE.

[11] Additional details about how the variables were constructed are available in Appendix B: Variables Construction for DCE.

more representative than in-person convenience samples and less representative than nationally representative probability samples used by firms like YouGov. Most importantly, Berinsky, Huber and Lenz (2012) are able to replicate multiple attitudinal experiments previously conducted with nationally representative sampling designs using mTurk data. Moreover, Kuziemko et al. (2013) find that the unweighted mTurk sample for their study was as representative of US Census data as unweighted samples from a nationally representative sample of US adults contacted by Columbia Broadcasting Company (CBS).

The survey was posted on mTurk on January 5 and January 12 of 2017. We collected complete responses from 999 mTurk participants, at a rate of $0.75 per response. The average time to completion was 6 minutes 52 seconds; therefore, the hourly rate was $6.54. Descriptive statistics for survey participants, comparable U.S. Census data for 2010, and the Kuziemko et al. (2015) mTurk sample (N=3,741) are shown in Table 2.

[Insert Table 2 Here]

The data in our sample is especially over-representative of whites, the young, college educated and Democrats. Our data more closely resemble the larger mTurk sampled collected by Kuziemko et al. (2015). In their sample, women are over-represented by the same amount men are over-represented in our data.[12] Whites comprised 78 percent of the Kuziemko et al. (2015) sample compared to 81 percent in our data. The average age of their respondents was 35, whereas our average age (based on the median values of the "binned" age data we collected) is 36. Meanwhile, 43 percent of their sample has at least a college degree, whereas 51 percent of our sample does. Finally, 68 percent of respondents in their sample voted for Obama, whereas 66 percent of our sample either self-identify as Democrat or voted for a Democrat in the previous election. Overall, these statistics confirm that our data are not representative but are typical of mTurk

[12]Our sample has more male participants than other mTurk samples that have been evaluated (Berinsky, Huber and Lenz, 2012; Huff and Tingley, 2015). The samples of Berinsky, Huber and Lenz (2012) and Huff and Tingley (2015) were comprised of 40 and 47 percent male, respectively.

respondents.

5.2 Econometric Methods

Up to this point, we have defined four statistics of interest, related to certain values, and presented the desired estimands of interest (the shape of the iso-welfare curve). We now describe our econometric models for estimating the iso-welfare curve. As we are looking to estimate utility parameters, we employ choice modeling methods. We first estimate a non-parametric OLS model to obtain raw estimates of respondent preferences that represent different combinations of social welfare variables. We then estimate a Cobb-Douglas utility function to estimate the different iso-welfare curves. The Cobb-Douglas model imposes additional functional form assumptions on the data; thus, the raw estimates from the OLS model provide information as to whether these assumptions are reasonable.

In the non-parametric approach, we estimate the normalized level of utility as the probability that society X (independently of whether society A or society B is presented in the question) is chosen. The model includes interactions of indicator variables that correspond to combinations of societal values that a society could have. For example, five levels of average family income and EEO were randomly assigned to respondents. The interaction of these five variables results in 25 parameter estimates. The following regression model formalizes the approach:

$$\mathbb{1}_i[X \text{ is chosen}] = \sum_{j=1}^{5}\sum_{k=1}^{5}\left(\delta_{jk}\mathbb{1}^X_{jk\cdot\cdot}\right) + \sum_{l=1}^{5}\left(\rho_l\mathbb{1}^X_{\cdot\cdot l\cdot}\right) + \sum_{m=1}^{5}\left(\sigma_m\mathbb{1}^X_{\cdot\cdot\cdot m}\right) + \varepsilon_{iX} \qquad (1)$$

Where $\mathbb{1}_i[X \text{ is chosen}]$ is an indicator equal to 1 if society X is chosen by individual i and 0 otherwise. Meanwhile, $\mathbb{1}^X_{jklm}$ is an indicator equal to 1 (0 otherwise) if society X has j level of income, k level of income inequality, l level of average education and m level of EEO. Therefore, the coefficients δ_{jk} represent fixed effects for each combination

of income and income inequality (of which there are 25). Such fixed effect coefficients are equivalent to utility values of each combination of income/income equality. The coefficients ρ_l and σ_m capture the utility of each level of average education and EEO, respectively. In separate models, we exchange k income inequality with l average education or m EEO, which provide combinations of the interactions of income/average education and income/EEO, respectively. The final specification replaces j level of income with m EEO, which gives the trade-off between equal income and EEO (i.e., "Rawlsian trades"). Finally, ε_{iX} is an individual error term related to heterogeneity in preferences for X. Because the choice sets are randomly assigned to individuals, $\mathbf{E}[\varepsilon_{iX}] = 0$ and, therefore, the OLS model (equivalent to a linear probability model) is an unbiased estimator of the normalized utility levels (Hainmueller, Hopkins and Yamamoto, 2014).

Although the econometric model (1) is extremely flexible and provides interval-scaled estimates for different combinations of societal values, it does not allow us to estimate an isoutility curve, nor does it take advantage of the actual structure of the data generation process. Therefore, our second methodological approach is the traditional choice model of McFadden (1980). We begin by translating the societal preferences of an individual i for society A into a Cobb-Douglas utility function:

$$U_i(A) = \alpha_0 + \alpha_Y ln(Y_A) + \beta_Y ln(Y_A^{Ineq}) + \alpha_E ln(E_A) + \beta_E ln(E_A^{Ineq}) + \varepsilon_{iA} \qquad (2)$$

Where α_Y and α_E are coefficients corresponding to preferences for levels of income and average education, and β_Y and β_E represent the negative preference for inequality of income and educational opportunity, respectively.[13] As usual, we can include a constant α_0 in this utility and an error ε_{iA} representing the individual heterogeneity in

[13]For the variable EEO, recall that respondents are presented with information about the difference in the percentage of children attending college who come from family incomes in the 90th and 10th percentiles. A negative coefficient on β_E indicates dis-utility for higher levels of 90/10 higher education attainment, i.e. inequality of educational opportunity.

preferences for societies.

Recall that the survey asks individuals to choose between two societies, A and B. Following McFadden (1980); Train (2003), for society A to be chosen it must be the case that $U(A) - U(B) > 0$. Given the functional assumption, this amounts to the following equation:

$$\alpha_Y ln\left(\frac{Y_A}{Y_B}\right) + \beta_Y ln\left(\frac{Y_A^{Ineq}}{Y_B^{Ineq}}\right) + \alpha_E ln\left(\frac{E_A}{E_B}\right) + \beta_E ln\left(\frac{E_A^{Ineq}}{E_B^{Ineq}}\right) + \eta_i^{AB} > 0 \qquad (3)$$

Where the error term $\eta_i^{AB} = \varepsilon_{iA} - \varepsilon_{iB}$. There are four features of equation (3) to highlight. First, if we assume that each error $\varepsilon_{i\cdot}$ follows a normal distribution, then η_i^{AB} would also be normally distributed and, therefore, the parameters can be estimated by a Probit Maximum Likelihood Estimator. Second, given that each pair of societies are randomly assigned across individuals, the estimates are unconfounded by preferences for EEO and societal income. Third, because each society has the same set of features, there is not a constant in the model and, in consequence, we do not include one in our estimation. Fourth, as is typical in Cobb-Douglas models, there are decreasing marginal returns to each variable and the marginal rate of substitution varies in the same proportion as the ratio between social statistics and as the ratio of the utility parameters of each good.

6 Results

In this section we present results. Results from equation (2) allow us to plot the ordered preferences that respondents have for the social welfare variables, while results from equation (4) provide marginal rates of substitution (MRS) statistics. From these latter results, we can draw SWF iso-welfare curves. Later, we test for heterogeneous preferences based on political affiliation and educational attainment. Finally, we test whether individual preferences for equality of income and EEO can be linked to conse-

quentialist reasons. Specifically, we present an additional survey question that stipulates that societies A and B are alike in crime, democratic participation, and social mobility, and then ask respondents whether they prefer society A or B.

6.1 Non-parametric Results

We start with estimates of the preferences for each social value from equation (1). These results allow us to rank different combinations of social statistics. Figure 2 shows a contour that summarizes the interactions δ_{jl} (income and education levels), δ_{jk} (income and income inequality), δ_{jm} (income and EEO) and δ_{km} (income and EEO), respectively. In each model, 25 possible estimates are available. Cells shaded darker blue indicate that an assigned combination of societal values (e.g., income $45,000 and 90/10 income ratio 10.5) are less preferred. Cells shaded darker red indicate a stronger preference.

[Insert Figure 2 Here]

As expected, higher income per capita, higher levels of college enrollment, lower income inequality and more EEO are preferred, as indicated by the dark red shading in the upper right quadrants and dark blue shade in the lower left quadrants of each panel. These results demonstrate that respondents understood the survey and were providing preferences that were correctly ordered.

More interestingly, we can observe which social statistics appear to be more relevant to individuals. Because variables were generated based on observed standard deviations across CZs in the United States, the shaded cell regions indicate strength of preference in standard deviation units. In general, individuals are willing to trade equivalent units of income for average education (Figure 2(a)), indicated by the uniformity along the diagonal from the upper-left to the lower-right. However, for income equality (Figure 2(c)) and EEO (Figure 2(b)), preferences for income often outweigh equivalent preferences (in standard deviation units) for equality (e.g., $48,000 income and a 90/10

income ratio of 10.5 is preferred to $36,000 income and a 90/10 income ratio of 8.8). Indeed, preferences for EEO are nearly lexicographic, as increases in estimated utility largely result from increases in societal income along the vertical axis.

Linear probability models are common estimators for discrete choice experiments, but as shown here, they have limited value if the objective is to recover the MRS and to make comparisons across variables. We now turn to results from equation (3), which provide the statistics of interest but require parametric assumptions.

6.2 Parametric Results

Having displayed how bundles are ranked, we can now move on to direct estimation of the iso-welfare curve. We first present direct estimates from equation (3) in Panel (A) of Table 3.

[Insert Table 3 Here]

As expected based on results from Figure 2, increases in income and average education have positive effects on utility, while increases in the statistics measuring inequality have negative signs. All point estimates are statistically significant at $p < .01$.

The estimates of the Cobb-Douglas parameters allow us to map the iso-welfare curves, which are drawn using the utility levels at different points of the y-axis. These parametric results mimic the contour figures generated from the non-parametric models: average education is more relevant than income inequality, while income inequality appears more relevant than EEO. These results indicate that independent improvement in income equality is preferred to equivalent (in standard deviations) independent improvement in EEO, as shown by the fact that the iso-welfare curve is steeper in Figure 2(c) than in Figure 2(b). Indeed, when compared directly in Figure 2(d), we see that respondents are willing to trade approximately two units of EEO for one unit of income inequality.

[Insert Figure 3 Here]

Although graphical representation of the iso-welfare curve provides much information, the figures do not give a statistic of the exact trade-offs that individuals are willing to make between social values. For that purpose, we present the estimation results of equation (3) in Panel (B) of Table 3, which are the MRS (or willingness to pay) statistics for certain social variables. As is well known, the MRS can be easily recovered from the Cobb-Douglas utility, as:

$$MRS_{x,y} = \frac{\text{Coefficient } x}{\text{Coefficient } y} \cdot \frac{y}{x} \tag{4}$$

where y is usually a variable for price but in our case is average societal income; x is a vector of the other societal variables of interest (average education and the two inequality statistics). The ratio indicates how much respondents are willing to pay in social income for values of x. In the special Rawlsian trade-off, y is set to EEO and x is equal income; this MRS statistic indicates how much respondents are willing to trade EEO for equal income.[14] Therefore, if we assume that the mean values of x and y provide a reasonable approximation to estimate the MRS,[15] the willingness to pay (WTP) can be expressed as the average income individuals are willing to sacrifice.[16] The findings indicate that:

- Individuals would be willing to decrease average income by \$1,760 dollars to decrease the equal opportunity higher education (HE) enrollment difference from 54% to 44%. This implies that individuals would have a WTP of \$1,408 dollars for a 1 SD decrease in the equal educational opportunity statistic.

- Individuals would be willing to decrease average income by \$1,986 dollars to

[14] Under the Rawlsian schema, fair equality of opportunity is lexicographically superior to equal income, but we have already observed from Figures 1 and 3 that respondents are not lexicographic with respect to opportunity.

[15] In other words, that the MRS is stable across different values of x and y; based on the results from Figure 3, this assumption seems reasonable.

[16] Standard errors for the MRS statistics are calculated using the delta method. All results in the itemized list below are statistically significant at $p < .01$.

decrease the 90/10 income inequality ratio from 9.6 to 8.6. This implies that individuals would have a WTP of $3,298 dollars for a 1 SD decrease in the income inequality statistic.

- Individuals would be willing to decrease average income by $3,720 dollars to increase HE enrollment from 28% to 38%. This implies that individuals would have a WTP of $5,208 dollars for a 1 SD increase in the average education statistic.

- Individuals would be willing to increase the HE enrollment difference by 11.3% to decrease the 90/10 income ratio from 9.6 to 8.6. This implies that individuals would have a WTP of 2.34 SD of the EEO statistic dollars for a 1 SD decrease in income inequality.

As shown, individuals are willing to sacrifice important amounts of income in order to improve other social parameters. Indeed, educational attainment, which is often encouraged for its effects on economic growth, is *independently* supported; individuals are willing to sacrifice social income for an educated population. In that sense, economic growth should not be the sole focus of policy, and public policy decisions that require trade-offs between efficiency and other outcomes ought to be considered.

In contrast to popular narratives about the special importance of the "American Dream" and its relation to EEO, our data reveal that individuals care more about income equality than equal access to higher education. In traditional survey environments in which respondents are asked how much they value EEO, revealed preferences may be inflated because respondents believe that equal opportunity is a "package good," with perceived spillovers for both income and equality of income. When we separate the preferences into the different parts, our results suggest that the actual worth of EEO *per se* is relatively minor, as respondents would take income and equality of income over equal access to higher education. These data speak to contemporary debates about minimum wage increases and guaranteed minimum incomes on the one hand

(policies that aim to reduce income inequality at the potential cost of societal income) and free higher education and remedies for the achievement gap on the other (policies that aim to increase EEO at the potential cost of societal income). We have presented evidence that can guide policy when the choice is between improving college access for low income students or delivering direct income subsidies to low income families, all else constant. Survey respondents indicate they would support the latter, if the outcomes of the policies were known to them in advance.

6.3 Heterogeneous Preferences

We now turn to whether there is heterogeneity in the social preferences identified here. We identify heterogeneous effects based on political affiliation and respondent educational attainment. Both of these attributes are relevant for the variables included here. While it is well known that right-leaning voters care less about income inequality than left-leaning voters, it is not known whether this preference is due to differences between the political groups in how much equality is expected to cost. Moreover, it is not known whether right-leaning voters have different preferences for EEO than left-leaning voters.[17] Educational attainment is relevant both because it correlates with individual income, and because individual educational attainment may influence how much educational inequality and overall educational attainment are valued.[18] Results for political affiliation are presented in Table 4.[19]

[17]Our survey asked participants two questions about their political affiliation. We ask them if they self-identify as one of the major political parties (Republican, Democrat, Green, or Libertarian. We then ask them which political party for which they most recently voted. We code as "right-leaning" a respondent who self-identified as Republican or Libertarian or most recently voted for either of those parties. We code as "left-leaning" a respondent who self-identified as Democrat or Green or most recently voted for either of those parties. Identifying political affiliation this way reduces the sample from 3,996 observations to 3,592.

[18]Educational attainment is coded as 0 if the respondent has a 4 year college degree or more; 1 if the respondent identified as having "some college"; 3 if the respondent has a high school diploma or less. We exclude trade and vocational schools from the analysis. This reduces the sample to 3,484 observations.

[19]Table 4 displays the relevant MRS statistics; in Appendix C: Additional Results, Table C.2 displays model coefficients.

[Insert Table 4 Here]

There are important differences in the egalitarian preferences across political groups. Results from Table 4 show that, compared to Republicans, Democrats are willing to give up nearly 3 times the amount of average income for either of the equality measures. These differences in the willingness to pay are statistically significant at $p < .01$. Democrats also have a greater WTP for average educational attainment ($p < .05$); however, the magnitude of this difference is not large. Both groups are willing to sacrifice important amounts of income (over $2,500) to increase the average HE enrollment by 10%. This result suggests the presence of an overlapping consensus between parties with respect to increasing average levels of education; however, the parties are far apart with respect to equalizing income or educational opportunities. Finally, it is interesting to note that both groups give greater weight to income equality relative to EEO, despite having different preferences for equalities of both kinds.

Results based on educational attainment are presented in Table 5.[20] Respondents with college degrees have greater WTP for reductions in income inequality than those with some college education. Conversely, those with no college experience have greater WTP for reductions in income inequality than the college educated. Thus, WTP for income equality are not monotonic according to educational attainment. Meanwhile, WTP statistics for EEO are very similar for all educational groups. This finding is interesting because political affiliation influences preferences for both income equality and EEO, while educational attainment (an indicator of class status) influences only preferences for income equality. If preferences for equal opportunity are class *insensitive*, then it may be easier to obtain political consensus for policies promoting EEO, despite the fact that preferences for EEO are weaker on average. This feature of EEO may be a second explanation (in addition to perceived spillover benefits) for its prominence in US society. Finally, college educated respondents have greater WTP for levels of

[20] Table 5 displays the relevant MRS statistics; in Appendix C: Additional Results, Table C.3 displays model coefficients.

HE enrollment than those with no college experience, but there is no difference when compared to those with some college experience.

[Insert Table 5 Here]

6.4 Testing for Non-Intrinsic Egalitarian Preferences

Finally, we hypothesize that preferences for EEO and income can be attributed to instrumental reasons. To test this hypothesis, we included an extra question (question 5) within the survey. This question was identical to the original four questions respondents had seen previously with the added condition that both societies were similar with regards to crime rates, unemployment rates, upward mobility, and democratic representation.[21] We provide this question after respondents viewed the original series of four discrete choices so as to not prime them to have instrumental reasons in mind. The purpose of the condition is to exclude reasons for equality that are instrumental to public goods, social mobility and political institutions. As shown in Table 6,[22] the willingness to pay for income equality decreased, although we only have enough statistical power to reject at 10%.[23] There is a slight reduction in WTP for EEO (and slightly greater willingness to exchange EEO for equal income) when the societal constraints are added, but these statistics are not significant at conventional levels. We find no evidence that respondents link HE enrollment to these types of reasons, as the WTP is nearly identical in both the main and constrained models.

[Insert Table 6 Here]

As a result, it appears that preferences for income inequality and EEO are partially motivated by instrumental concerns, but the instrumental reasons identified here are weakly explanatory of those preferences.

[21] A screen shot of the specific survey question can be found in Appendix Figure A.6.

[22] Table 6 displays the relevant MRS statistics; in Appendix C: Additional Results, Table C.4 displays model coefficients.

[23] Respondents received the question main question four times and the additional societal constraint only one time; therefore, statistical power is relatively low.

7 Conclusion

In this paper we have estimated social preferences for efficiency, educational attainment, income equality and equal educational opportunity (EEO). Not surprisingly, average income is an important aspect of respondent's social welfare functions. More interestingly, respondents are willing to exchange societal income to increase levels of educational attainment (meaning that educational attainment is not desired purely for economic reasons) as well as both aspects of equality (meaning that respondents have meaningful distributive concerns). Moreover, respondents display a stronger independent preference for income equality relative to EEO. This finding contradicts the traditional notion that equal access to higher education is more important than income equality in the United States. Quite possibly, EEO is believed to have positive effects on economic growth and income equality; for this reason, equal opportunity has large popular support, despite it having relatively low independent value.

Finally, we emphasize that the implemented DCE has useful features that can be replicated in subsequent research. First, we use true variation in income, education and inequality statistics. Second, by randomly assigning societal income, we impose a budget constraint, which provides a common metric for making comparisons across different social variables. Third, we integrate different dimensions of societal well-being into a common framework. While DCEs are prevalent in political science and some sub-disciplines of economics, they have not been used to identify the types of social preferences evaluated here. In consequence, additional research with different samples and social statistics could provide deeper understanding of social preferences for efficiency, income equality and EEO, as well as other social concerns.

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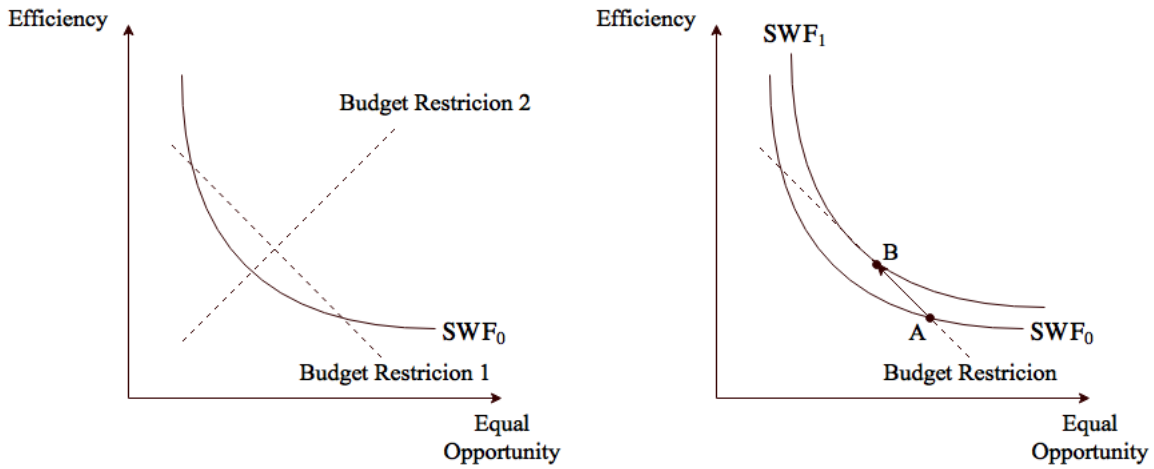
Figures

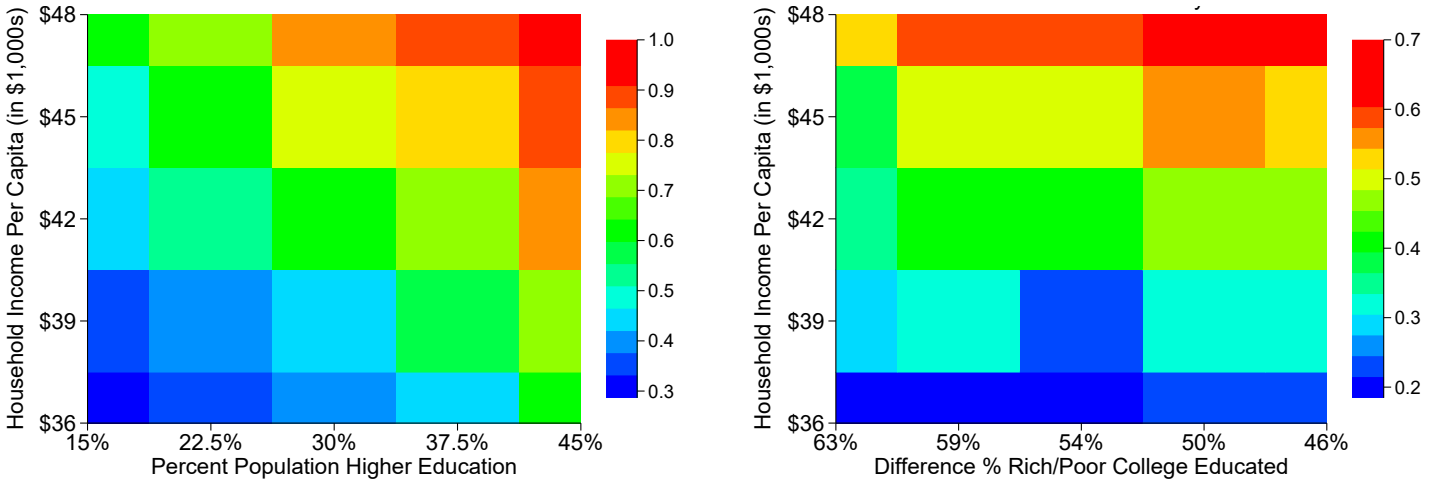
Figure 1: Social Welfare Preferences, Budget Restriction and Policy Decision



(a) Efficient Budget Constraint (b) Trade-off Budget Constraint

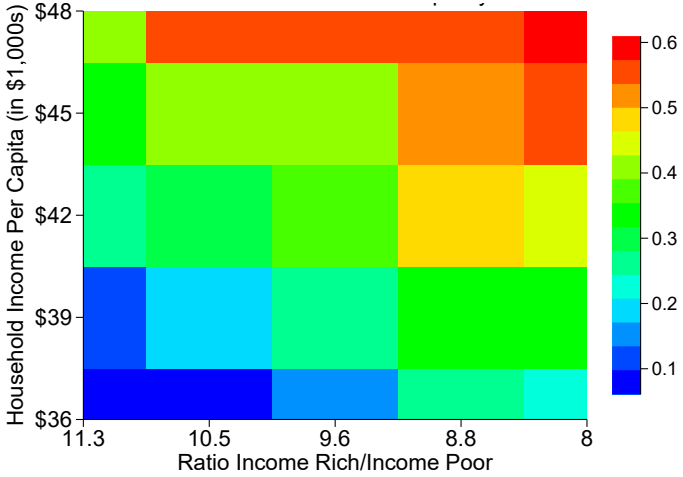
Note: Conceptual model describing trade-offs among social variables.

Figure 2: Nonparametric Estimates Social Welfare Preferences, Contour Plots

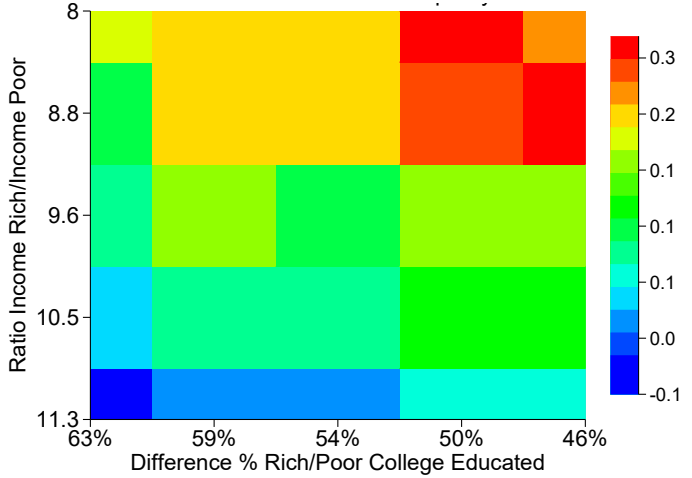


(a) Income/Education

(b) Income/Equal Opportunity



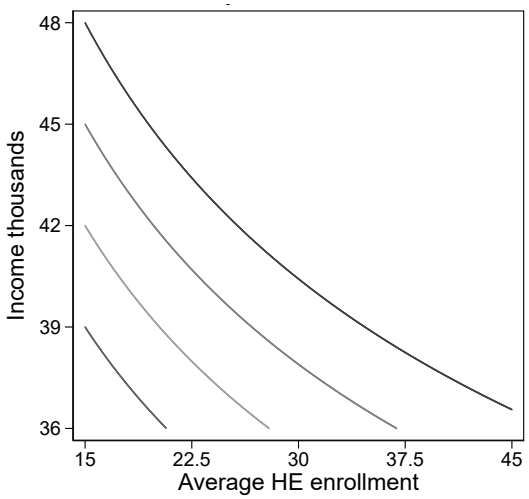
(c) Income/Income Inequality



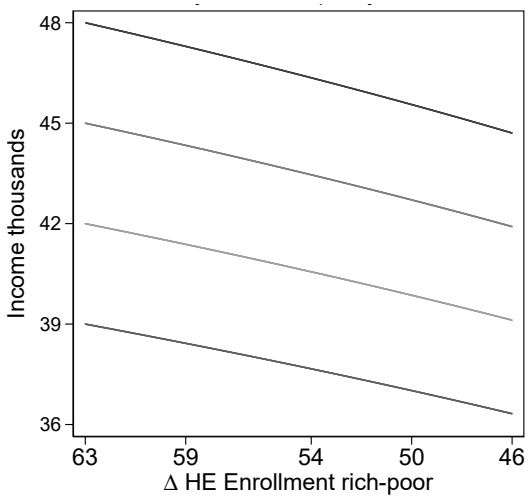
(d) Income Inequality/Equal Opportunity

Note: Each panel represents a pairwise trade among social variables. Shaded cell regions indicate strength of preference in standard deviation units for pairwise combinations of social variables. Darker red indicates greater utility; darker blue indicates less utility. Utility estimates based on Equation (1).

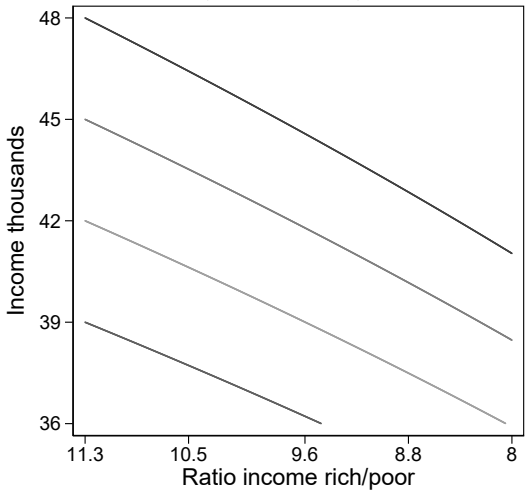
Figure 3: Log Linear Estimates Social Welfare Preferences, Iso-curves



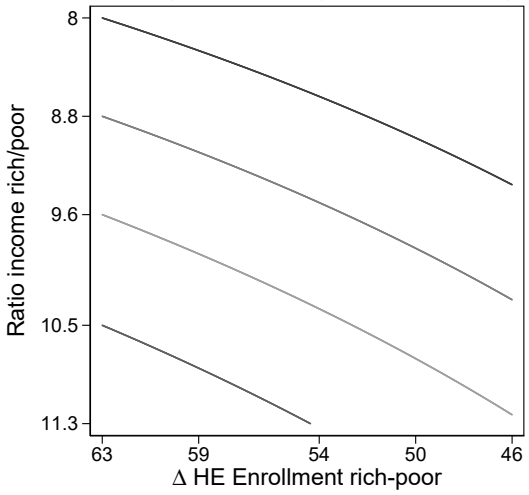
(a) Income/Education



(b) Income/Equal Opportunity



(c) Income/Income Inequality



(d) Income Inequality/Equal Opportunity

Note: Each panel represents a pairwise trade among societal variables. Iso-welfare curves derived from estimates from Equation (3).

Tables

Table 1: Discrete Choice Experiment, Randomization Values Actual

Variable	**Mean - 1SD**	**Mean - 0.5SD**	**Mean**	**Mean + 0.5SD**	**Mean + 1SD**
Income Per Capita	$36,000	$39,000	$42,000	$45,000	$48,000
Income Inequality	8	8.8	9.6	10.5	11.3
Percent College Educated	14%	21%	28%	35%	42%
Education Inequality	46%	50%	54%	59%	63%

Note: Descriptive statistics for the four societal variables randomly assigned to respondents. All values taken from Chetty et al. (2014) from the `Equality-of-Opportunity.org` project. Mean corresponds to national mean and variation is based on the estimated between-commuting zone standard deviation.

Table 2: Descriptive Statistics (i) Analytic mTurk sample, (ii) 2010 US Census, and (iii) Kuziemko et al. (2015)

	mTurk Sample		*2010 US Census*	*Kuziemko et al. (2015)*
Variable	**Freq.**	**Percent.**	**Percent.**	**Percent.**
Gender				
Female	420	42.17	50.8	57.2
Male	576	57.83	49.2	42.8
Race/Ethnicity				
Black	72	7.24	12.6	7.8
Other	123	12.37	17.7	7.6
White	799	80.38	63.7	77.8
Age				
18-29	358	35.87	9.9 (18 to 24)	35.41 (sample mean)
30-44	445	44.59	26.6 (25 to 44)	
45-64	164	16.43	26.4 (45 to 64)	
65 or older	31	3.11	13.0 (65 plus)	
Educational Attainment				
Associate's or two-year college degree	95	9.52	5.52	
Did not finish high school	5	0.5	11.6	
Four-year college degree	362	36.27	19.49	43.3 (at least college)
Graduate or professional degree	121	12.12	11.19	
High school diploma or equivalent	109	10.92	28.95	
Some college, no degree	252	25.25	19.1	
Technical or vocational school after HS	32	3.21	4.04	
Lib/Dem				
Democrat	592	65.92		67.5
Republican	306	34.08		

This table compares descriptive statistics for the analytic mTurk sample, the 2010 US Census, and the larger mTurk sample obtained in Kuziemko et al. (2015).

Table 3: **Cobb Douglas Results, Main Effects & Marginal Rate of Substitution**

Panel A: Probit Coefficient Estimates	
Δ ln(Income)	4.280***
	(0.206)
Δ ln(Inc. Inequality)	-1.943***
	(0.159)
Δ ln(Avg. HE enrollment)	1.061
	(0.056)
Δ ln(Equal Opport.)	-0.968***
	(0.157)
Panel B: Marginal Rate of Substitution	
$MRS_{\text{Inc. Inequality,Income}}$	-1.986***
	(0.170)
$MRS_{\text{Equal Opport.,Income}}$	-0.176***
	(0.029)
$MRS_{\text{Avg. HE enrollment,Income}}$	0.372***
	(0.022)
$MRS_{\text{Inc. Inequality,Equal Opport.}}$	11.294***
	(1.910)
N	3996

Note: Robust standard errors in parentheses. MRS measured at the mean values. Probit coefficients based on Equation (3). MRS estimates based on Equation (4). *** p<0.01, ** p<0.05, * p<0.1.

Table 4: **Marginal Rate of Substitution, Respondent Political Affiliation**

Parameter	Democrats	Republicans	Dem - Repub
$MRS_{\text{Inc. Inequality,Income}}$	-2.575***	-0.893***	-1.683***
	(0.243)	(0.252)	(0.350)
$MRS_{\text{Equal Opport.,Income}}$	-0.237***	-0.082*	-0.154**
	(0.040)	(0.046)	(0.061)
$MRS_{\text{Avg. HE enrollment,Income}}$	0.407***	0.294***	0.113**
	(0.031)	(0.032)	(0.045)
$MRS_{\text{Inc. Inequality,Equal Opport.}}$	10.888***	10.830*	0.058
	(1.858)	(6.327)	(6.594)
N	2,368	1,224	3,592

Note: Robust standard errors in parentheses. MRS measured at the mean values. Probit coefficients (shown in Appendix C) based on Equation (3). MRS estimates based on Equation (4). Standard errors for tests of significance among partisans calculated using the delta method. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: **Marginal Rate of Substitution, Respondent Level of Education**

Parameter	College or More	Some College	Less than College	College - Some	College - Less
$MRS_{\text{Inc. Inequality,Income}}$	-1.968***	-2.921***	-1.090***	0.952*	-0.878*
	(0.225)	(0.450)	(0.397)	(0.503)	(0.457)
$MRS_{\text{Equal Opport.,Income}}$	-0.194***	-0.209***	-0.206***	0.015	0.012
	(0.038)	(0.072)	(0.068)	(0.081)	(0.078)
$MRS_{\text{Avg. HE enrollment,Income}}$	0.392***	0.394***	0.211***	-0.002	0.181***
	(0.030)	(0.055)	(0.034)	(0.063)	(0.046)
$MRS_{\text{Inc. Inequality,Equal Opport.}}$	10.150***	13.991***	5.280**	-3.841	4.870
	(2.086)	(4.696)	(2.413)	(5.138)	(3.189)
N	2,020	1,008	456	3,028	2,476

Note: Robust standard errors in parentheses. MRS measured at the mean values. Probit coefficients (shown in Appendix C) based on Equation (3). MRS estimates based on Equation (4). Standard errors for tests of significance among educational level calculated using the delta method. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: **Marginal Rate of Substitution, Societal Constants**

Parameter	Main Effects	Societal Constant	Main - Cons
$MRS_{\text{Inc. Inequality,Income}}$	-2.008***	-1.477***	-0.531*
	(0.170)	(0.283)	(0.306)
$MRS_{\text{Equal Opport.,Income}}$	-0.178***	-0.117**	-0.061
	(0.029)	(0.053)	(0.059)
$MRS_{\text{Avg. HE enrollment,Income}}$	0.376***	0.373***	0.003
	(0.022)	(0.036)	(0.036)
$MRS_{\text{Inc. Inequality,Equal Opport.}}$	11.301***	12.640**	-1.340
	(1.912)	(6.008)	(6.297)
N	4995		

Note: Robust standard errors in parentheses. MRS measured at the mean values. Probit coefficients (shown in Appendix C) based on Equation (3). MRS estimates based on Equation (4). Standard errors for tests of significance between main effects and controlling for instrumental reasons calculated using the delta method. *** p<0.01, ** p<0.05, * p<0.1.

A Appendix: Survey Platform

Figure A.1: Survey Platform: Variables Description

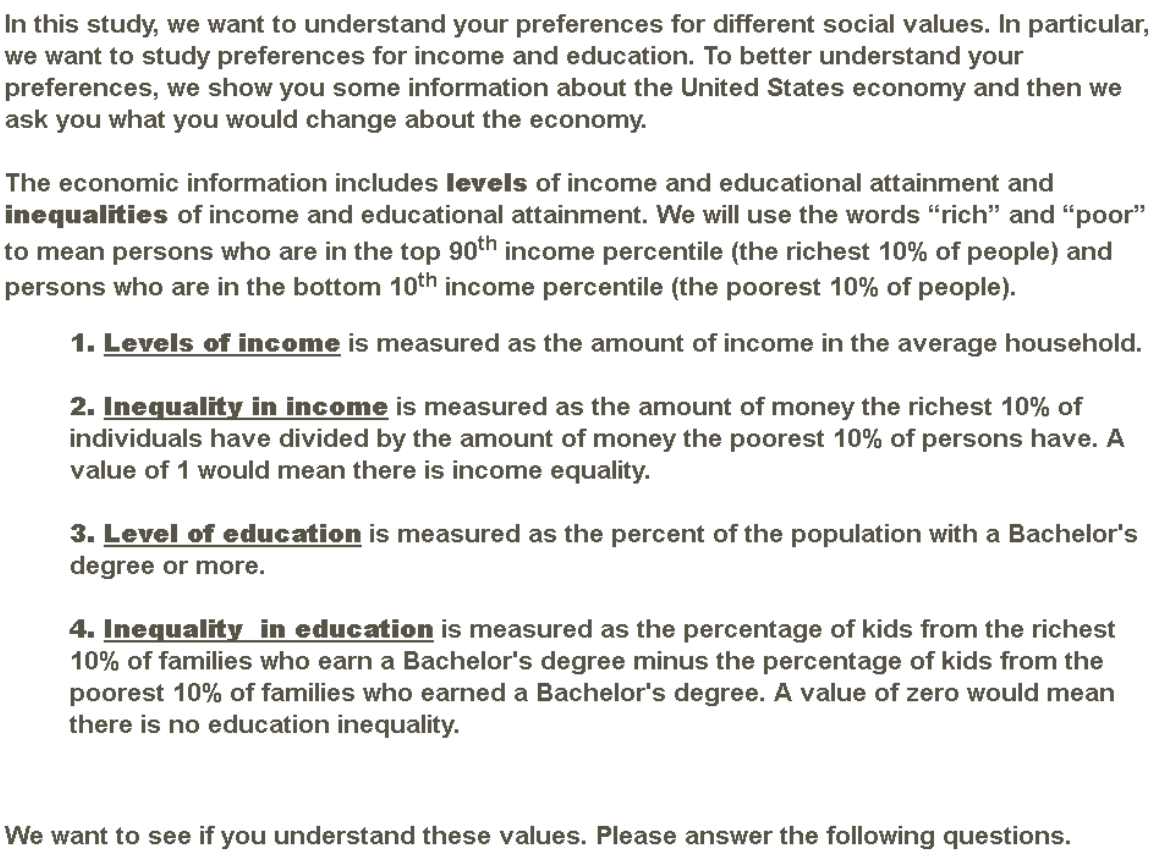


Figure A.2: Survey Platform: Diagnostic Question, Income Inequality

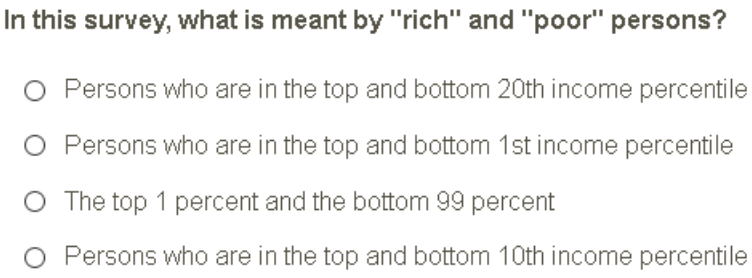


Figure A.3: Survey Platform: Diagnostic Question, Equal Opportunity

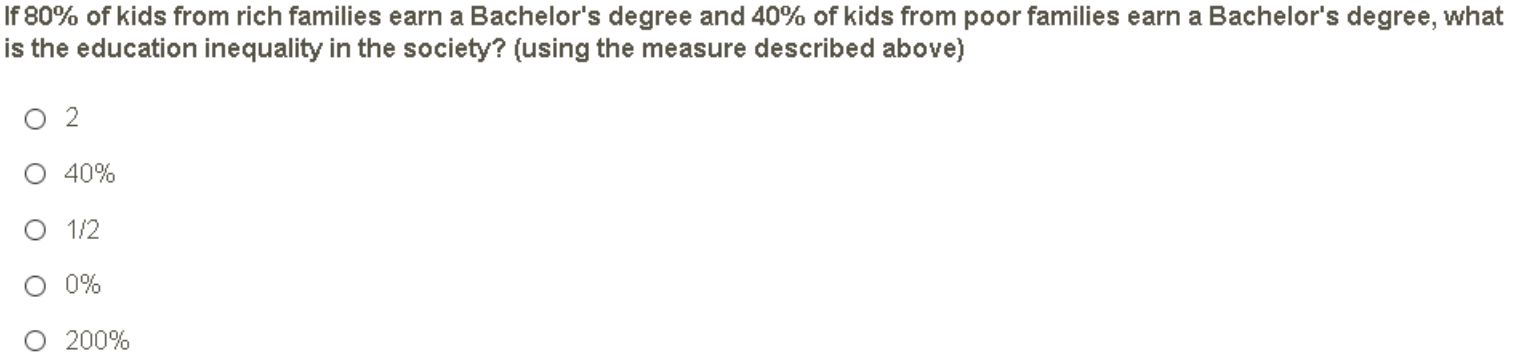


Figure A.4: Survey Platform: Diagnostic Question, Societal Comparison

Now compare between Countries A and B.

	Country A	Country B
Level of Income	$42,354	$45,230
Income Inequality	9.6	10.5
Level of Education	28%	21%
Education Inequality	54%	50%

Which of the following statements is true?

- ○ Country B is richer but Country A has more income inequality.
- ○ Country A has more educated people but Country B has less education inequality.
- ○ Country B has more income inequality but Country A is richer.

Figure A.5: Survey Platform: Societal Preferences

Here are U.S. statistics for 2010.

Level of Income	$42,354	The average household in the US makes about $42,000 per year
Income Inequality	9.6	The income of the rich is 9.6 times higher than the income of the poor.
Level of Education	28%	28 percent of the population has a Bachelor's degree or higher
Education Inequality	54%	On average, people from rich families go to college 54% more than people from poor families.

Please indicate which of the following future society would be better, all things considered.

Question 1

Please carefully review the options detailed below, then please answer the questions.

Which of these choices do you prefer?

	Society 1	Society 2
Income Levels	Average household has $48,000	Average household has $48,000
Income Inequality	Average income of the rich is 11.3 times higher than average income of the poor	Average income of the rich is 8.0 times higher than average income of the poor
Education Levels	21% of people have at least a college education	35% of people have at least a college education
Education Inequality	On average, kids from rich families go to college 59% more than kids who come from poor families	On average, kids from rich families go to college 50% more than kids who come from poor families

Which of these societies would be better, all things considered?

Society 1 ○ Society 2 ○

Figure A.6: Survey Platform: Societal Preference, Constants Applied

Which of these choices do you prefer?

	Society 11	Society 12
Income Levels	Average household has $42,000	Average household has $42,000
Income Inequality	Average income of the rich is 8.0 times higher than average income of the poor	Average income of the rich is 11.3 times higher than average income of the poor
Education Levels	42% of people have at least ac ollege education	35% of people have at least a college education
Education Inequality	On average, kids from rich families go to college 54% more than kids who come from poor families	On average, kids from rich families go to college 46% more than kids who come from poor families

In addition, to the above information, Societies 11 and 12 are similar in the following ways:

1. **crime rates**
2. **unemployment rates**
3. **the percentage of people agree with the following statement: "if you work hard, then you will have a good income"**
4. **the chance of becoming middle class**
5. **the percentage of people who vote in elections**
6. **the percentage of people who agree with the following statement: "all persons have equal influence over politics"**

Which of these societies do you think is better, all things considered?

Society 11 ○ Society 12 ○

B Appendix: Variables Construction for DCE

The variables that are presented to survey respondents are constructed based on means and standard deviations from US commuting zones (CZ) using data made available by Chetty et al. (2014) from the Equality-of-Opportunity.org project. We ask respondents to choose values that conform to different combinations of CZ-level family income per capita, income inequality, level of higher education and educational mobility. Effectively, respondents are randomly assigned CZ descriptive characteristics and are asked which bundle of descriptive statistics is most desirable.

Our goal in constructing these variables is two-fold: plausibility and interpretability. We generate the variables based on actual averages corresponding to contemporary United States economic conditions, using national averages and variation between CZs to provide plausible regional descriptions.

Variable means are defined as follows. For average income, we use aggregate household income per capita, which is the total household income in the United States divided by the total number of persons in the United States ages 18-65, for Census survey years 2006-2010.[24] Income inequality is the income of the 90th percentile divided by the income of the 10th percentile in the United States, for year 2010.[25] Percent college educated is the percent of the population with a Bachelor's degree or more in year 2010.[26] Education inequality is the percent of children from the 90th income percentile who attend a 4-year college program by age 18-21 minus the percent of children from the 10th income percentile who attend a 4-year college program by age 18-21.[27]

Variable standard deviations are defined as follows. Household income per capita is taken from the Chetty data, which is defined as aggregate household income in the

[24] Aggregate household income and counts of persons by age are downloaded from the National Center for Education Statistics https://nces.ed.gov/programs/edge/.

[25] Downloaded from Equality of Opportunity project. See Online Data Table 2, Parent Family Income Column, centile 90 divided by centile 10.

[26] Downloaded from the Census webpage.

[27] Downloaded from Equality of Opportunity project. See Online Data Table 10, Sheet "By Parent Income Percentile," Column College, centile 90 minus centile 10.

2000 census divided by the number of people aged 16-64. These data are available for every CZ in the United States and the standard deviation is the unweighted between-CZ standard deviation. Income inequality is defined as the 90/10 income ratio for each CZ using the Chetty data, and the standard deviation is the unweighted between-CZ standard deviation.[28] The percent of college educated by CZ, net of income, is taken from the Chetty data, which is defined as the residual from a linear regression of graduation rate (defined as the share of undergraduate students that complete their degree within 1.5 times the program duration) on household income per capita in 2000. Variation is defined as the unweighted between-CZ standard deviation.[29] The rich/poor difference in college education is taken from the Chetty data, where the difference for each CZ is calculated using the relative mobility measure to predict college attendance. Percentages of children attending college at the 10th and 90th percentiles are calculated for each CZ; we then take the p90-p10 difference and calculate the unweighted between-CZ standard deviation.[30] Means and standard deviations are shown in Table B.1.

Table B.1: Discrete Choice Experiment, Randomization Values Descriptives

Variable	**Mean**	**Std. Deviation**
Household Income Per Capita	42,354.24	5,750.70
90/10 Income Ratio	9.63	1.66
Percent College Educated	0.28	0.14
Education Inequality	0.54	0.08

[28]Downloaded from Equality of Opportunity project. See Online Data Table 7, using columns Parent Income P90 and Parent Income P10.

[29]See Online Data Table 8 and 9, for description of variable. The average of this variable is not easily interpretable, but we use only its standard deviation between CZs.

[30]Equality of Opportunity project online data Table 5. The variable "RM, College Attendance" is defined as the slope of OLS regression of indicator for college attendance between ages 18-21 on parent income rank in core sample. A ratio of college attendance between 90th and 10th parent income percentiles is not available from the data, as the OLS slope estimate is fitted through the origin; thus, the 90/10 ratio will always be equal to the slope.

C Appendix: Additional Results

Table C.2: **Cobb-Douglas Parameters Probit Estimation, Political Affiliation**

Democrat × Δ ln(Income)	4.149***
	(0.263)
Republican × Δ ln(Income)	4.728***
	(0.391)
Democrat × Δ ln(Inc. Inequality)	-2.442***
	(0.214)
Republican × Δ ln(Inc. Inequality)	-0.965***
	(0.274)
Democrat × Δ ln(Avg. HE enrollment,Income)	1.127***
	(0.077)
Republican × Δ ln(Avg. HE enrollment,Income)	0.927***
	(0.093)
Democrat × Δ ln(Equal Opport.)	-1.262***
	(0.206)
Republican × Δ ln(Equal Opport.)	-0.501*
	(0.281)
N	3,592

Note: Robust standard errors in parentheses. Probit estimates based on Equation (3) used to calculate MRS for Table 4. *** p<0.01, ** p<0.05, * p<0.1.

Table C.3: **Cobb-Douglas Parameters Probit Estimation, Educational Attainment**

Variable	Coeff.
College or More × Δ ln(income)	4.822***
	(0.301)
Some College × Δ ln(income)	3.412***
	(0.375)
Less than College × Δ ln(income)	5.212***
	(0.637)
College or More × Δ ln(Inc. Inequality)	-2.169***
	(0.245)
Some College × Δ ln(Inc. Inequality)	-2.278***
	(0.301)
Less than College × Δ ln(Inc. Inequality)	-1.298***
	(0.473)
College or More × Δ ln(Educ.)	1.260***
	(0.084)
Some College × Δ ln(Educ.)	0.897***
	(0.106)
Less than College × Δ ln(Educ.)	0.732***
	(0.124)
College or More × Δ ln(Educ. Inequality)	-1.202***
	(0.235)
Some College × Δ ln(Educ. Inequality)	-0.916***
	(0.305)
Less than College × Δ ln(Educ. Inequality)	-1.383***
	(0.466)
N	3484

Note: Robust standard errors in parentheses. Probit estimates based on Equation (3) used to calculate MRS for Table 5. *** p<0.01, ** p<0.05, * p<0.1.

Table C.4: **Cobb-Douglas Parameters Probit Estimation, Main Effects and Societal Constants Interactions**

Variable	Coeff.
Δ ln(income)	4.218***
	(0.188)
Δ ln(Inc. Inequality)	-1.936***
	(0.158)
Δ ln(Educ.)	1.057***
	(0.055)
Δ ln(Educ. Inequality)	-0.964***
	(0.157)
Δ ln(Inc. Inequality)$\times$Constant	0.512*
	(0.294)
Δ ln(Educ.)$\times$Constant	-0.009
	(0.101)
Δ ln(Educ. Inequality)$\times$Constant	0.330
	(0.322)
N	4995

Note: Robust standard errors in parentheses. Probit estimates based on Equation (3) used to calculate MRS for Table 6. *** p<0.01, ** p<0.05, * p<0.1.