A Meritocratic Origin of Egalitarian Behaviour

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Abstract: We report from a study of how uncertainty about whether a given inequality reflects performance or luck shapes distributive behaviour. We show theoretically that the reaction to uncertainty depends on how people trade off the *probability* of making a mistake when redistributing, and the *size* of this mistake. We show experimentally that uncertainty causes a strong egalitarian pull among a majority of meritocratic individuals. The theoretical framework and the experimental results are supported in general population surveys in the US and Norway. Our findings suggest that how people handle uncertainty about the source of inequality may be of great importance for understanding distributive conflicts in society.

Key words: inequality, fairness, redistribution, responsibility, performance, luck, experiment, survey.

JEL codes: C91, D63, D81, H23.

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1. Introduction

A person holding a meritocratic fairness view regards inequality in earnings as fair if it reflects differences in performance, but not otherwise. This fairness view is prevalent both in the laboratory and in the field (cf. Fong, 2001; Cappelen *et al.*, 2007; 2013; 2017; Almås *et al.*, 2020; see also Piketty, 1995; Alesina and Angeletos, 2005; Benabou and Tirole, 2006). However, since the meritocratic fairness view considers the source of income inequality morally relevant, it is not straightforward how to implement it in distributive situations where there is uncertainty about the cause of inequality. How should a meritocrat deal with a situation where she does not know if a person with low earnings is a low performer, or someone who has been unlucky? Although such uncertainty is prevalent in most distributive situations (for example in the design of tax policies and welfare schemes), we know very little about how people handle distributive conflicts in such situations.

Our paper provides novel large-scale survey evidence from the general populations in the United States and Norway showing that people indeed consider earnings an imperfect signal of superior performance, and examines experimentally distributive behaviour when there is uncertainty about the source of inequality. To illustrate the experimental design, consider a situation where a spectator is tasked with redistributing earnings between two individuals who have worked, and where one of the two has earned more on a task than the other. It is, however, not clear whether the unequal earnings reflect differences in performance (in which case the individual with the higher earnings is also the best performer) or luck (in which case the individual with the lower earnings could be the best performer). If the person tasked with redistributing is a meritocrat, there is a trade-off between the possibility of making a large mistake by not redistributing (since there is a probability that the low earner is the best performer), with the

certainty of making two smaller mistakes by completely equalizing earnings (since one of the individuals is, in fact, the better performer). How a meritocrat handles this distributive conflict depends on how likely it is that the person with higher earnings is the best performer, and on the extent to which the meritocrat is particularly averse to making larger mistakes.

We introduce a simple model to illustrate this fundamental trade-off and show how uncertainty can – but does not have to – generate an egalitarian pull on the redistributive behaviour of meritocrats. The strength of this pull is increasing in the extent to which a meritocratic decision-maker has a relatively stronger distaste for making larger (but less probable) errors compared to making smaller (but more probable) ones. Which of these two distastes is stronger in practice is an empirical question, and we conduct a laboratory experiment to investigate the distributive behaviour of meritocrats in situations where there is uncertainty about whether an inequality reflects performance or luck.

In the first part of the experiment, *the work stage,* participants perform a task. In the second part, *the earnings stage*, participants are randomly matched in pairs. One participant in the pair is allocated a high earning for her performance in the work stage, whereas the other is assigned a low earning. The allocation comes about in one of two ways: either the high earning is allocated to the person who performed the best in the work stage, or it is allocated by a coin flip. In the third part of the experiment, *the redistribution stage*, the participants act as impartial spectators and decide whether to redistribute earnings between two other participants. The experiment varies the probability that the initial earnings allocation is determined by performance. The impartial spectator is only informed about this probability, and not of who in the pair actually had the best performance.

The first main contribution of our paper is to show that uncertainty indeed creates an egalitarian pull on the redistributive behaviour of meritocrats, even though our analysis also reveals significant heterogeneity in the extent to which meritocrats respond to uncertainty. A majority of the meritocratic spectators in our experiment become much more prone to equalize earnings when the uncertainty is increasing, which establishes, to the best of our knowledge, a previously undocumented origin of egalitarian behaviour. We provide a theoretical framework to guide our interpretation of the results, which formalizes spectator behaviour as minimizing a loss function representing deviations from what the spectator considers to be the fair distribution. This framework implies that people make a trade-off between the probability of making mistakes and the size of mistakes. The framework provides the basis for an individual-level structural analysis, where we show that the egalitarian pull in the distributive behaviour reflects that people on average have a convex loss function. However, the structural analysis also shows significant heterogeneity in the convexity of the loss function of spectators, which implies substantial disagreement among meritocrats about how to handle distributive conflicts under uncertainty.

Our second main contribution is to provide evidence of the importance of uncertainty for understanding distributive conflict in society. To investigate the broader importance of our framework and main findings, we conduct two large-scale general population surveys in the US and Norway. We document that both Americans and Norwegians view earnings as an imperfect signal of superior performance, and that a vast majority of both populations can be described as meritocrats. Hence, the surveys establish that the framework for our analysis, where meritocrats make distributive choices under limited information, is of great importance for understanding distributive behaviour in society. As in the laboratory, we find that the majority of both American and Norwegian meritocrats react to uncertainty by implementing a more egalitarian distribution.

The surveys also identify important differences in how Americans and Norwegians consider uncertainty in distributive situations, which may contribute to explaining why these societies differ significantly in their level of redistribution. In particular, we find that Norwegians perceive there to be more uncertainty about who has been the best performer in society compared to Americans, and that meritocrats in Norway experience an even more pronounced egalitarian pull under uncertainty than meritocrats in the US.

Finally, the survey findings provide evidence suggesting that there is an important link between the key structural parameter in our framework capturing the convexity of the loss function and policy attitudes toward redistribution. We provide the first set of evidence showing that liberals/left-of-centre people tend to have a more convex loss function, assigning more weight to greater losses, which is consistent with them being more in favour of redistributive taxation under uncertainty.

Our paper contributes to the extensive literature on social preferences (e.g., Fehr *et al.*, 1993; Fehr and Schmidt, 1999; Bolton and Ockenfels, 2000; Andreoni and Miller, 2002; Charness and Rabin, 2002; Cappelen *et al.*, 2007; Bartling *et al.*, 2012, 2015; Falk and Szech, 2013; Durante *et al.*, 2014; Hufe *et al.*, 2018; Almås *et al.*, 2020) by providing a novel investigation of how uncertainty about the source of inequality shapes distributive behaviour. An important strand of the literature has investigated how the source of an inequality matters for whether it is perceived as fair; the nearly unanimously reached conclusion is that inequalities that are due to luck are regarded as less fair than those rooted in performance differences (Alesina *et al.*, 2001; Fong, 2001; Konow 1996, 2000, 2009; Cappelen *et al.*, 2007, 2013, 2017; Krawczyk, 2010; Karadja *et al.*, 2017; Gärtner *et al.*, 2017, 2021; Bartling *et al.*, 2018). However, unlike the present study, this literature features no uncertainty about the source of inequality.

Our paper also relates to a small but growing body of work that considers theoretically (Fudenberg and Levine, 2012; Saito, 2013; Cappelen *et al.*, 2020) and empirically (Charness *et al.*, 2015; Cettolin and Riedle, 2016; Exley, 2016; Bortolotti *et al.*, 2017; Cettolin *et al.*, 2017; Cappelen *et al.*, 2018) how different types of limited information can impact redistributive preferences. However, in this literature, the focus has not been on uncertainty about the source of the inequality. Thus, the present paper is the first to study how the effect of uncertainty about the source of inequality depends on the curvature of the loss function, and the first to document an egalitarian pull on the behaviour of meritocrats under such uncertainty. Finally, our paper relates to the important normative tradition arguing that fairness principles should be derived by considering which principles people would prefer if they did not know which position they have in society, i.e. behind a veil of ignorance (Harsanyi, 1953; Rawls, 1971). In recent years, this approach has been investigated experimentally (Zame *et al.*, 2020), and we complement it by studying how uncertainty affects impartial spectator behaviour, and how it may cause meritocratic spectators to act in a more egalitarian manner.

We advance both the theoretical and the empirical parts of these literatures by studying uncertainty about the source of inequality, and by showing that such uncertainty can create a strong egalitarian pull on the behaviour of meritocrats. We provide a theoretical framework to guide the interpretation of the findings, and provide structural estimates that complement the regression analysis. Finally, we offer new evidence of meritocratic preferences in general populations and show that most people indeed perceive the uncertainty about the source of inequality studied in this paper to be prominent in the economy.

The remainder of the paper is organized as follows. Section 2 describes the design and implementation of the experiment. Section 3 presents the theoretical framework, and Section 4

presents the experimental results. Section 5 describes the design, analysis, and results of the general population surveys, and Section 6 concludes.

2. The Experiment

Each experimental session consisted of three parts: 1) The work stage, 2) the earnings stage, and 3) the redistribution stage. All participants made decisions in all parts. Participants were informed at the start of the experiment that there would be several parts, and that instructions would be given for one part at a time.[1]

In the work stage, all participants performed a math task in which they had five minutes to add up as many sets of five two-digit numbers as possible without using a calculator (Niederle and Vesterlund, 2007). Participants were not given a piece rate compensation, but were told that their performance might influence their earnings later in the experiment and that, were this to be the case, it would be beneficial to have completed more tasks correctly.[2]

In the earnings stage, participants were paired anonymously. Each pair was informed that one participant had earned $20 and the other $0 for the work completed, and that the earnings had been determined by either luck or performance. In the case of luck, the participant who was lucky in a computerized fair coin toss had earned $20, whereas in the case of performance, the participant who completed the most math tasks correctly in the work stage had earned $20 (ties were broken randomly by the computer). We use this winner-take-all earnings structure because it provides a distributive setting with ample room for redistribution. The participants were only given

[1] All instructions for this study are available at https://sites.google.com/site/johannamollerstrom/survey-materials-and-data. The data are available at Cappelen et al (2021).

[2] We opted against providing detailed information about how the performance could matter later in the experiment for two reasons; first, to keep the instructions short and simple, and, second, to reflect important distributive situations in society, where many aspects of how earnings are determined are vague. One could worry that vague information may sell the meritocratic proclivity of participants short. However, this should not be a concern in the present study, as the vast majority of participants can indeed be identified as meritocrats. Also, our primary interest is not in identifying an exact share of meritocrats, but rather to investigate how the redistributive behaviour of people holding meritocratic preferences is impacted by uncertainty.

information about whether they themselves were a high or low earner at the very end of the experiment.

In the redistribution stage, participants acted as impartial spectators, that is, they made choices that did not influence their own monetary payoff (Konow, 2000, 2005; Cappelen *et al*, 2013). All participants were told that they had been matched to one of the pairs formed in the earnings stage, and that they would make choices regarding the distribution of earnings for the two participants in that pair. To remove efficiency consideration, it was costless to the spectator to redistribute (or not). It was made clear in the instructions that the redistributive choice would have no monetary consequences for the participant herself as she was making decisions as an impartial spectator for another pair, not for her own pair. In addition, anticipated reciprocity concerns were not present, as neither of the participants in this matched other pair was making decisions about the spectator's own pair. We used the strategy method (Selten, 1967), with each spectator making decisions in seven situations. The spectators knew that one of the seven situations (but not which one) corresponded exactly to what had happened in their matched pair, that there were exactly two spectators matched to each pair (this was done in order for each pair to be matched to the same number of spectators), and that one of the two spectators' choices in this situation would be chosen randomly and implemented as the final payment for the pair.

The spectators were informed about who in the pair had earned \$20 and who had earned \$0. They were furthermore informed about the probability that performance determined the earnings allocation. In the seven situations, this probability took on the values 0, 1, 10, 50, 90, 99 and 100%, which allows us to study both small and large changes in the probability. These probabilities correspond to the following probabilities for the high earner being the best performer:

50, 50.5, 55, 75, 95, 99.5 and 100%, which is what we focus on in the analysis.[3] The order of the seven situations was randomized, and the spectators could redistribute any amount (including zero) from the high earner to the low earner in each of the seven situations.

After the spectators had made their decisions, but before any information about final payment was provided, all participants filled out a demographic questionnaire. The questionnaire also contained incentivized questions about the statistical concept of "probability" and unincentivized questions about personal risk preferences. Finally, before leaving the laboratory, they were paid in private according to the selected spectator decision.

The experiment was conducted at the ICES laboratory at George Mason University (GMU). Participants were recruited from the laboratory's subject pool, which consists of students from GMU. A total of 222 individuals, who could only take part once, participated. The average age was 22 years, and females made up 48% of the sample. Participants earned an average of $19.48 (including a fixed show-up fee of $5, and final payments were rounded up to the closest 50 cents) for their participation in a 45-minute session.

We used the software z-Tree (Fischbacher, 2007) to computerize the experiment. To ensure common knowledge, the experimental instructions were read aloud in addition to being provided on participants' computer screens. At three points in the experiment, participants answered a quiz to ensure that they understood the instructions. They had to answer the questions correctly to continue, and the very few participants who experienced problems with the quiz questions were given repeated instructions by the experimenter.

[3] When performance determines the allocation with, e.g., 0% probability, it is still a 50% probability that the high earner was the best performer and lucky in the draw of the winner. In section A3.3 in Online Appendix A, we investigate whether participants make a mistake in the interpretation of the probabilities, e.g., by interpreting a 0% probability for performance determining the allocation as a 0% probability that the high earner is the best performer. We show that our results are robust to excluding the small share of participants whose behaviour indicated that they might have misinterpreted the information in this way.

3. Theoretical Framework

We use a simple social preference model to help us formulate hypotheses, organize the analysis and interpret the results. We denote the two people in a pair *H* (high earner) and *L* (low earner). Their initial (*pre*-redistribution) earnings are such that *H* has a larger share *s* of total earnings than *L*, i.e., $s_H^{PRE} > s_L^{PRE}$.

We assume that the spectators find it fair that *H*, after redistribution, receives a share s_H^{FAIR} of the total earnings (*L* consequently receives a fair share $s_L^{FAIR} = (1 - s_H^{FAIR})$). We furthermore assume that the spectators dislike if post-redistribution income, s_H^{POST}, deviates from what they view as fair, and we capture these preferences with a general loss function,

$$V(s_H^{POST};\cdot) = -(|s_H^{POST} - s_H^{FAIR}|)^{\alpha}, \quad (1)$$

where α indicates the curvature of the loss function.

We allow spectators to hold different fairness views, as captured by s_H^{FAIR}. First, consider a spectator who does not view the source of the inequality as relevant when deciding about redistribution. Her fairness view is independent of whether *H* is the best performer, and as she has no uncertainty about what is the fair share to *H*, she can ensure a fair distribution simply by setting $s_H^{POST} = s_H^{FAIR}$. An example of such a view is the strict egalitarian fairness view, which always considers an equal split fair, $s_H^{FAIR} = 1/2$.[4]

We focus on the meritocratic spectators, for whom the source of the inequality is crucial; s_H^{FAIR} depends on whether the high earner *H* is the best performer. We define a spectator as a

[4] Strict libertarians would also remain unaffected by the source of inequality, as they find the initial inequality in earnings fair. Since $s_H^{PRE} = 1$ in the experiment, $s_H^{FAIR} = 1$ for strict libertarians, see e.g. Cappelen *et al.* (2007) for more on the concepts of strict egalitarianism and libertarianism.

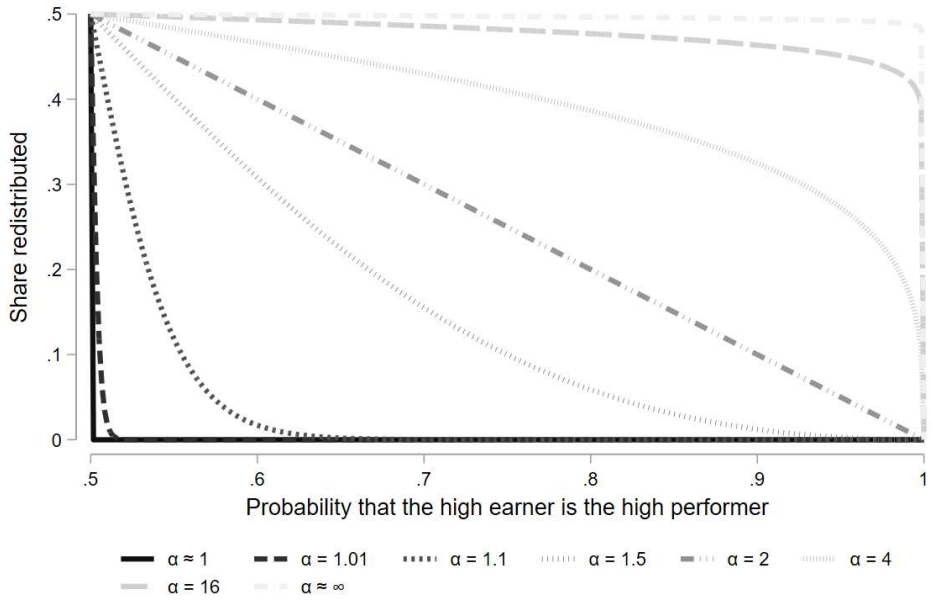
meritocrat if she considers it fair that the individual who is the best performer gets a larger share of the total earnings in the pair, $s_{BEST}^{FAIR} > 1/2$. Hence in a situation where *H* is the best performer, the meritocratic spectator has $s_H^{FAIR} = s_{BEST}^{FAIR} > 1/2$ (and if *H* is not the best performer, $s_H^{FAIR} = (1 - s_{BEST}^{FAIR}) < 1/2$).

In a situation with no uncertainty about *H* being the best performer, a meritocrat spectator implements $s_H^{POST} = s_H^{FAIR}$. Under uncertainty, however, a meritocratic spectator maximizes the expected loss function. Let p be *the probability that the high earner is the best performer* and let $p \geq 1/2$ (in the experiment, p is 0.5, 0.505, 0.55, 0.75, 0.95, 0.995 and 1, respectively). This implies that being a high earner is a signal about being the best performer, with the earnings signal being at least weakly informative. Expanding equation (1) gives us the expected loss for a meritocratic spectator:

$$E\Big(V(s_H^{POST};\cdot)\Big) = -p(|s_H^{POST} - s_{BEST}^{FAIR}|)^{\alpha} - (1-p)(|s_H^{POST} - (1 - s_{BEST}^{FAIR})|)^{\alpha} \qquad (2)$$

If a meritocratic spectator has a linear loss function ($\alpha = 1$), she simply aims to minimize the expected deviation from what she views as the fair distribution, and gives the high earner a share of the total payment equal to s_{BEST}^{FAIR} when the signal is strictly informative, i.e. when $p > 1/2$. In the case where $p = 1/2$, she is indifferent between giving s_{BEST}^{FAIR} to the high or the low earner (or any other distribution of the earnings). In contrast, a meritocrat with $\alpha \to \infty$ equalizes the incomes for all values of $p < 1$, because such spectators are infinitely averse to large mistakes, and therefore prefer to incur, with certainty, the smaller mistakes that come with equalizing. Figure 1 illustrates the predicted share redistributed in this framework for various values of α in the case where $s_{BEST}^{FAIR} = 1$.

Figure 1: Predicted Share Redistributed for Meritocrats with Different Values of α



Notes: The figure shows the relationship between the level of uncertainty and the optimal share redistributed given (2), assuming that $s_{BEST}^{FAIR} = 1$*. The relationship is similar for* $0.5 < s_{BEST}^{FAIR} < 1$*, with the floor moved up to* $(1 - s_{BEST}^{FAIR})$*.*

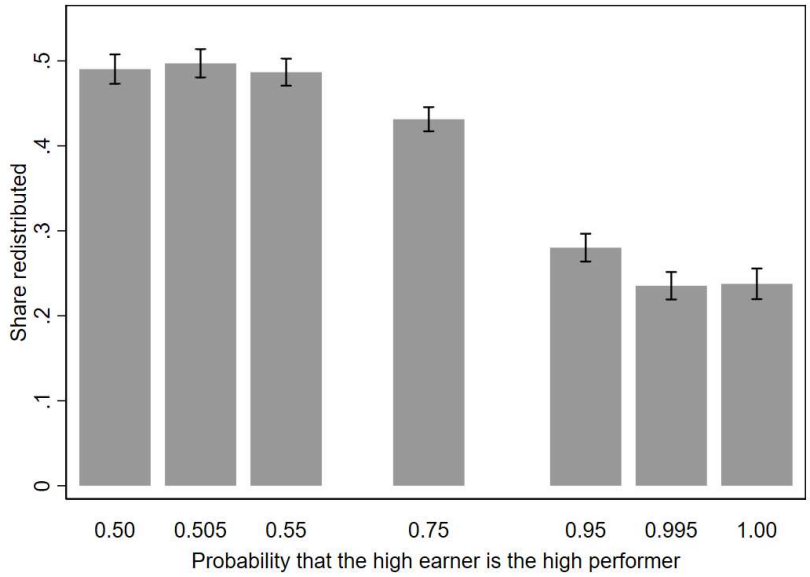
We observe that any value of $\alpha > 1$ implies an egalitarian pull, in the sense that it makes the meritocrat split more equally than when she knows for sure who is the best performer. More generally, a higher value of α makes the meritocratic spectator split more equally; i.e., the pull towards egalitarian behaviour under uncertainty is increasing in α. When $\alpha = 2$, i.e., when the loss function is quadratic, the amount of desired redistribution decreases linearly in p. In sum, Figure 1 shows that spectators may share the same meritocratic fairness view in the sense that they agree on how much the best performer should get when there is no uncertainty and they may have the same beliefs about the level of uncertainty, but still behave very differently because they differ in the convexity in the loss function and therefore in their reaction to this uncertainty. Depending

on how sensitive they are to large deviations from the fair distribution, some meritocrats may redistribute to equalize incomes completely, whereas others may not redistribute at all.

4. Results

We first provide an overview of the spectator behaviour in the main experiment. Figure 2 shows the average share of the earnings redistributed in each of the seven situations.

Figure 2: Share Redistributed for Different Values of p



Notes: The figure provides an overview of the average share redistributed to the low earner in each of the seven situations considered in the experiment (n = 1554, 7 choices by 222 spectators). Error bars indicate standard errors (clustered on individuals). See Figure A1 in Online Appendix A for histograms of share redistributed for each value of p.

Comparing the two extreme situations in Figure 2, we observe that when the spectators know for sure that the high earner is the best performer ($p = 1$, the rightmost bar), they find it, on average, fair that the high earner gets almost 80% of the total income. In contrast, we see almost complete equalization of income when earnings are uninformative of performance ($p = 0.5$, the leftmost bar). We further observe that at the extremes, small changes in probability have almost no effect on spectator behaviour, which is consistent with the average spectator not having a very

convex loss function (cf. Figure 1). Finally, we note that the share distributed in the intermediate situation, where there is a 75% probability that the high earner is the best performer, is above the linear prediction based on the two extreme situations, which is suggestive of the average spectator having a convex loss function with $\alpha > 2$. In section A2 in Online Appendix A, we provide the corresponding regression analysis of the aggregate patterns.

We now turn to the individual-level analysis. We define a meritocrat as a spectator who allocates more than half of the total earnings to the high earner when there is no uncertainty about the high earner being the best performer (i.e., when $p = 1$). We focus our analysis on the spectators (76% of our sample) who satisfy this requirement.[5] These meritocratic spectators redistribute 47.4% (SE = 2.04, median = 50) when $p = 0.5$ and 11.5% (SE = 1.11, median = 0) when $p = 1$.

For each meritocratic spectator, we use a non-linear least squares estimator to estimate the curvature parameter α based on equation (2).[6] We allow s_{BEST}^{FAIR} (the fair share to the best performer) to vary at the individual level and set it equal to the share that an individual meritocrat allocates to the high earner when $p = 1$. The results of the individual estimations are shown in Figure 3. Panel A shows the distribution of s_{BEST}^{FAIR}, and Panel B shows the distribution of the estimated α. We observe from Panel A that 1 is both the median and the mode of s_{BEST}^{FAIR}, showing that most

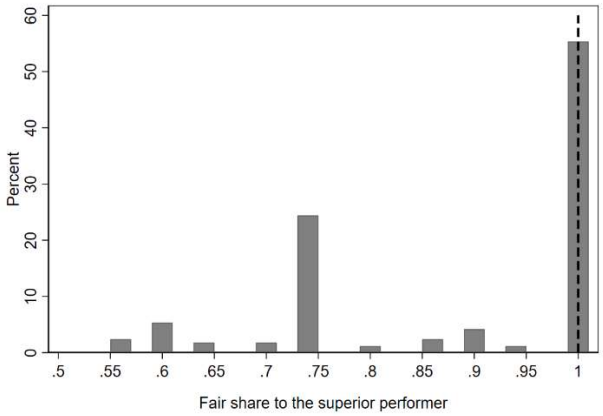
[5] Out of the 54 participants who are not classified as meritocrats, 24 are strict egalitarians and always split the total earnings equally between the two participants in the pair. In section A1 in Online Appendix A, we provide a descriptive analysis of the behaviour of the participants who are not classified as meritocrats.

[6] The estimation procedure is as follows. First, we obtain the first-order condition of equation (2) with respect to s_H^{POST}, $s_H^{POST^*} = 1 - s_{BEST}^{FAIR} + \frac{2s_{BEST}^{FAIR}-1}{1+\left(\frac{1}{p}-1\right)^{\frac{1}{\alpha-1}}}$. We use this to derive the optimal level of redistribution for given parameter values of p and s_{BEST}^{FAIR}. We estimate this non-linear equation for each participant for a given s_{BEST}^{FAIR} (equal to the share given to the higher performer when p = 1). Let the optimal share redistributed as predicted by the model *be* $s^*(\alpha, p)$, and participant i's actual choice in situation j be $s_{i,j}$. A non-linear least squares then solves the following problem for each participant i: $\alpha_i = arg\min_{\alpha}\left(s_{i,j} - s^*(\alpha, p_j)\right)^2$. The first-order condition is for each participant i is $\sum_j \left[\frac{\partial s^*(\alpha,p_j)}{\partial \alpha}\left(s_j - s^*(\alpha, p_j)\right)\right] = 0$, which corresponds to the following moment condition: $E\left[\frac{\partial s^*(\alpha,p_j)}{\partial \alpha}\left(s_j - s^*(\alpha, p_j)\right)\right] = 0$. For each individual, we estimate the α that best matches their actual choice (s_H^{POST}) in the experiment (using a grid search in R). The results reported here are robust to using least absolute deviations (LAD) instead of non-linear least squares (NLS), with LAD being less sensitive to outliers than NLA. The LAD results are available from the authors on request.

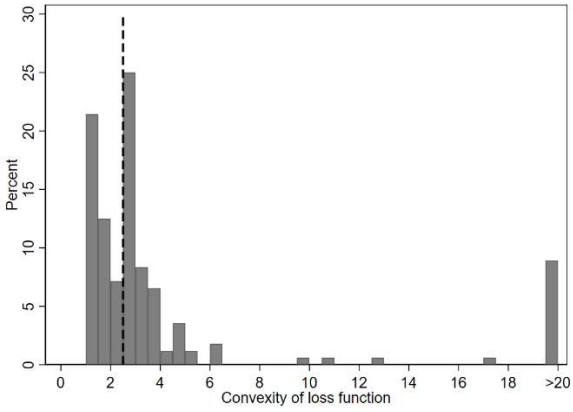
meritocrats do not redistribute anything to the low earner when the high earner is known with certainty to be the best performer. The mean value of s_{BEST}^{FAIR} is 0.88. In Panel B, we observe significant variation in the estimated convexity of the loss function among the meritocratic spectators, with a median value of $\alpha = 2.5$.

Figure 3: Individual-level Calibrations for the Meritocrats

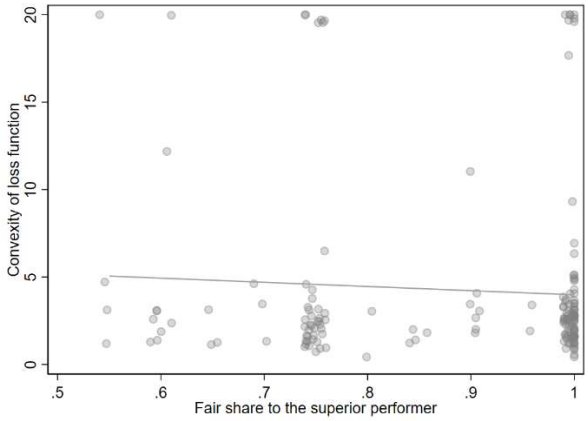
Panel A: Distribution of s_{BEST}^{FAIR}



Panel B: Distribution of Estimated α



Panel C: Joint Distribution of s_{BEST}^{FAIR} and Estimated α



Notes: The figure shows the distribution of the share allocated to the best performer when p = 1 (Panel A) and the estimated α (Panel B), for all meritocratic spectators (N = 168). The dotted line marks the medians of the respective distributions. Panel C depicts the joint distribution of s_{BEST}^{FAIR} and the estimated α with the linear fit.

Panels A and B of Figure 3 show that meritocratic spectators differ in two important respects: in what they think of as the fair share to give to the best performer, and in the convexity

of the loss function. Interestingly, in our sample, we observe that there is greater heterogeneity in the curvature of the loss function, with some meritocrats having an extremely convex loss function whereas it is close to linear for others. The median α is well above 2 (66% of the meritocrats have $\alpha > 2$ – $p<0.001$ for t-test of the null hypothesis that the share is 50%). Hence, the analysis shows that uncertainty creates a significant pull towards more egalitarian behaviour for most meritocrats. In Panel C, we report the joint distribution of the two parameters in the model at the individual level. We observe that there is no significant correlation between the estimated curvature of the loss function and what the meritocrat considers fair to give to the best performer (p=0.424). This suggests that these two parameters capture independent characteristics of an individual's social preferences.

In section A3 in Online Appendix A, we report a number of robustness checks: First, we show that our results are robust to only focusing on the first choice of the spectators (utilizing the between-subject version of our experimental design). Second, we exclude participants who showed limited statistical knowledge on the incentivized questions about the statistical concept of probability. Third, we redo our analysis, excluding participants who may have misunderstood the stated probability as the probability that the high earner is the best performer. Excluding these participants leaves our main results unchanged. Fourth, we document that our results are robust to alternative definitions of what constitutes meritocratic preferences.[7] Finally, in Figures A10 and A11 in section A4 in Online Appendix A, we show that the model predictions for the share given to the high earner nicely fit the observed patterns, both in terms of aggregate behaviour and for subgroups characterized by the convexity in the loss function.

[7] In addition to these robustness checks, we replicated the experiment with new subjects four months after the original data collection and documented the same results as in the main data collection. In this follow-up experiment, we also conducted a treatment with additional explicitly compound uncertainty where we observe the same pattern as in the main analysis. We find that the egalitarian pull is, if anything, even more pronounced with this added uncertainty. We provide a more detailed analysis of the follow-up experiment in Online Appendix B.

5. General Population Surveys

To investigate the broader importance of our framework and results, we conducted two general population surveys in the US (n=1,002) and Norway (n=1,019).

To obtain a measure of fairness preferences, our surveys ask the respondents to indicate the extent to which they find it fair that talent ($fair_{talent}$), hard work ($fair_{work}$), and luck ($fair_{luck}$) determine a person's income on a 0-10 scale, with 0 (10) indicating that the respondent finds it completely unfair (fair) if a particular factor determines income. We consider a person a meritocrat if she finds it fairer that talent and hard work determine income than that luck determines income, i.e., $fair_{talent} > fair_{luck}$ and $fair_{work} > fair_{luck}$.[8]

We also study how likely respondents think it is that a person with a high income is the best performer (p in our model). To that end, the survey asked whether respondents agree or disagree with the following statement: "In society, it is typically the case that people with a higher income have done a better job than people with a lower income" (0-10, with 0 (10) indicating complete disagreement (agreement) with the statement).[9]

Finally, to study how respondents react to uncertainty about whether the high earner is also the best performer (α in the model), we asked respondents to consider a situation where two people, Andrew and Bob, had been asked to do a job. The two had been told that the best performer would get a bonus of $200, while the other would get $0 (the question asked the respondent to assume that everyone, including the respondent herself, agreed that it is fair that, absent uncertainty, the best performer is rewarded the full bonus). The question continues: "The problem

[8] An important question not studied here is the extent to which talent should be considered a luck factor, see Cappelen *et al.* (2010). An interesting related literature studies the extent to which people are blamed for bad luck; see, e.g., Cappelen *et al.* (2013), Gurdal *et al.* (2013), and Mollerstrom *et al.* (2015). See also Charness *et al.* (2018) for a discussion of effort measurements in the laboratory.
[9] We asked this question on a Likert scale instead of directly asking for participant's perception of p on a percentage scale, as many participants in a general population sample could be expected to have difficulties handling percentages.

is that there is uncertainty about who the best performer was. Suppose that you learn that it is more likely that Andrew did the best job. With 75% probability he was the best performer, and with 25% probability Bob was the best performer. Without knowing any more, how much of the $200 would you give to Andrew and how much to Bob?"

In this setting, as shown in Figure 1, a person with a higher α would be more likely to split the earnings equally between Andrew and Bob. However, someone with α close to 1 would give all or most of the money to Andrew, who is most likely to be the best performer. In general, and in the language of our model, there is a negative correlation between the share given to Andrew and α.

In addition, the surveys collected demographic information; see Online Appendix C for an overview. The samples are representative of the respective populations on a set of observables (gender, age, and location within country). The surveys were administered by Research Now (in the US) and NorStat (in Norway).

Table 1 outlines the results. Considering first the pooled data, we start by noting that respondents find it most fair when income differences are determined by hard work, whereas talent is considered less fair as a determinant of income (8.41 vs. 6.44, $p<0.001$ for a two-sided t-test of differences).[10] This is consistent with the common view that talent is at least partly due to luck. At the same time, talent is considered fairer than luck (6.44 vs. 3.17, $p<0.001$), which is consistent with people considering that talent is at least partly developed through individual effort.

[10] All p-values in this section are for two-sided t-tests (assuming unequal variances when appropriate), unless otherwise noted.

Table 1: Results from the General Population Surveys

	POOLED	UNITED STATES			NORWAY		
	Total	Total	Democrats	Republicans	Total	Left of centre	Right of centre
Fair_work	**8.41**	8.46	8.52	8.66	8.37	8.21	8.55
(how fair that hard work determines income? 1-10 scale)	**(0.05)**	(0.07)	(0.10)	(0.11)	(0.06)	(0.09)	(0.09)
Fair_talent	**6.44**	6.89	6.92	7.46	6.01	5.74	6.31
(how fair that talent determines income? 1-10 scale)	**(0.06)**	(0.09)	(0.14)	(0.14)	(0.08)	(0.12)	(0.12)
Fair_luck	**3.17**	4.13	4.11	4.61	2.22	1.91	2.52
(how fair that luck determines income? 1-10 scale)	**(0.06)**	(0.10)	(0.16)	(0.16)	(0.08)	(0.10)	(0.13)
Share meritocrats	**0.73**	0.66	0.65	0.68	0.80	0.80	0.82)
(share of respondents for whom fair_work & fair_talent > fair_luck)	**(0.01)**	(0.01)	(0.02)	(0.03)	(0.01)	(0.02)	(0.02)
Perceived p	**4.22**	5.15	5.05	5.95	3.32	2.87	3.92
(agree that high income people are superior performers on 1-10 scale)	**(0.07)**	(0.09)	(0.16)	(0.15)	(0.08)	(0.11)	(0.14)
Share who gives all to Andrew	**0.15**	0.20	0.14	0.26	0.10	0.07	0.12
(share giving full reward to most likely best performer, indicating $\alpha \approx 1$)	**(0.01)**	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)	(0.02)
Share to Andrew	**0.67**	0.70	0.68	0.73	0.64	0.62	0.66
(share of reward given to most likely best performer, higher share indicates lower α)	**(0.00)**	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
N	**2,021**	1,002	382	339	1,019	455	397

Notes: Averages in pooled data, and by country, and by country and political affiliation. Standard errors in parentheses. "Fair_work", "Fair_talent" and "Fair_luck" are the answer to the question of how fair it is that a particular factor determines personal income (0-10 scale, 0=completely unfair, 10=completely fair). "Share meritocrats" is the share of respondents for whom fair_work>fair_luck and fair_talent>fair_luck. "Perceived p" is the answer to whether it is typically the case in society that people with a higher income have done a better job than people with a lower income (0-10 scale, 0=disagree completely, 10=agree completely). "Share gives all to Andrew" is the share of respondents who give the full reward to Andrew in the question described in the text (this corresponds to $\alpha=1$). "Share to Andrew" is the average share that all responders state that they would give to Andrew, a higher value is a proxy for a lower value of α. Political leaning defined as in footnote 20.

We find that people on average find it fair when hard work and talent determine income (average answers significantly above 5, $p<0.001$), but on average unfair when luck does so (average answer significantly below 5, $p<0.001$). We further observe that a large majority of respondents, 73%, can be described as having a meritocratic fairness view (the corresponding fraction from the laboratory experiment is very similar, 76%).[11]

Importantly, we find that high income is widely regarded as an imperfect signal of superior performance. The average respondent tends not to agree that people with a higher income have done a better job than people with a lower income (average response of 4.22 which is significantly below 5, $p<0.001$). This provides strong evidence of the importance of understanding how people handle the distributional situations studied in this paper.

Finally, only 15% of respondents would give everything to Andrew when there is uncertainty, even though he was the best performer with 75% probability. On average, the respondents stated that they would give 67% of the reward to Andrew (if we only consider the meritocratic respondents, the share remains virtually unchanged, at 68%), which means that they are significantly closer to splitting the reward equally than giving the high earner the full reward ($p<0.001$ for the difference-in-difference test).

In sum, the surveys provide strong evidence of the relevance of our experimental investigation, and the results are in line with our findings from the laboratory. We document that a majority hold a meritocratic fairness view, and that people on average are skeptical of high income being an informative signal of superior performance. In a distributive setting with uncertainty about who is the best performer, we validate our experimental findings by showing that there is a significant egalitarian pull on the distributive behaviour of a meritocratic population.

[11] Around 10% of the sample have $fair_{luck} = fair_{talent}$. Hence, if we relax the criteria for being defined as a meritocrat to $fair_{work} > fair_{luck}$ and $fair_{work} > fair_{talent}$, 84% of the sample can be defined as meritocrats.

Building on the fact that Norwegians demand more redistribution than do Americans, we can also use our survey to shed light on the extent to which reactions to uncertainty might contribute to our understanding of why there is such a difference between the two countries.[12] We also compare liberals and conservatives (with the former demanding significantly more redistribution than the latter) within the US and Norway.

Returning to Table 1 and considering the results by country, we note several similarities between Americans and Norwegians. In both countries, it is considered most fair when income is determined by hard work; there is no significant difference between Americans and Norwegians in how hard work is evaluated (p = 0.313). Talent as a factor determining income is seen as significantly less fair ($fair_{talent} < fair_{work}$ in both countries, $p<0.001$), but Americans find it more fair than do Norwegians when income is based on differences in talent ($p<0.001$). The largest difference between the countries is found in the luck factor. Whereas both Americans and Norwegians find it mostly unfair when luck determines income (the score is below the midpoint in both countries, $p<0.001$), Norwegians find it significantly more unfair than do Americans (2.22 vs. 4.13, $p<0.001$). In line with this (and in line with the findings of Almås *et al.*, 2020), the share of meritocrats is higher in Norway than in the US (80% vs. 66%, $p<0.001$), while a larger share in the US than in Norway can be described as strict libertarians in the sense that they find it equally *fair* to base income on luck, hard work or talent (7.6 vs. 2.3%, $p<0.001$). The share of people who can be described as strict egalitarians in the sense that they find it equally *unfair* to base income

[12] The differences between the United States and Scandinavia in terms of redistribution and the welfare state have been of great interest to economists and other social scientists (see, e.g., Edlund, 1999; Aaberge *et al.*, 2002; Jantti et al, 2006; Rogerson, 2007; Acemoglu et al, 2012; Aarøe and Petersen, 2014; Kleven, 2014; Fochesato and Bowles, 2015; Stiglitz, 2015, and Almås *et al.*, 2020). See also Alesina and Glaeser (2004) who provide a broader comparison between Europe and the United States.

on luck, hard work or talent is similar in the two countries (3.1% in the US vs. 2.5% in Norway, $p = 0.381$).[13]

We also find an interesting difference between the countries in terms of beliefs about income being informative of performance. While Americans find income to be marginally informative of performance, Norwegians disagree strongly with this view (5.15 vs. 3.32, $p<0.001$). This is suggestive of Norwegians perceiving there to be more uncertainty about who has been the best performer in society.

Finally, we show that, in both countries, people on average seem to have a convex loss function, and their behaviour is closer to complete equalization than to giving Andrew the full share. However, we find a striking difference between how Norwegians and Americans react to uncertainty. Americans are significantly more likely than are Norwegians to give the full reward to the most likely best performer. On average, Americans allocate 70% of the pie to Andrew, whereas Norwegians allocate 64% ($p<0.001$). These results suggest that Norwegians on average have a more convex loss function than Americans, as they are closer to equalization of earnings ($p<0.001$ for the difference-in-difference test).[14]

Taken together, the survey provides important evidence that sheds light on why there is more demand for redistribution in Norway than in the US. Norwegians are more likely than Americans to perceive there to be significant uncertainty about who is the best performer, and Norwegians have a more convex loss function.

[13] We define a strict libertarian as someone for whom $fair_{talent} = fair_{luck} = fair_{work} > 5$, and a strict egalitarian as someone for whom $fair_{talent} = fair_{luck} = fair_{work} \leq 5$.

[14] This cross-country result also holds when, instead of using a t-test, we regress the share given to Andrew on country, controlling for perceptions of p and/or how (un)fair the person thinks it is that hard work, talent, and luck determine personal income. Additional demographic control variables (age, gender, household income) can also be included without the result changing. See Online Appendix C.

The survey data also shed light on the political divide within the two countries, in particular why people with a conservative/right-of-centre political leaning demand less redistribution than those with a liberal/left-of-centre leaning.[15] The full analysis is provided in Online Appendix C; in particular, we provide the first set of evidence showing that liberals/left-of-centre people seem to have a more convex loss function than conservatives/right-of-centre people. This finding is suggestive of the structural parameter α being important for policy attitudes on redistribution and taxation. We further document that liberals/left-of-centre people view high income as a less informative signal about superior work performance than conservatives/right-of-centre people. Taken together, these findings suggest that uncertainty creates a stronger egalitarian pull among liberals/left-of-centre people than among conservatives/right-of-centre people in both countries. Finally, we observe that liberals/left-of-centre people regard it as less fair than conservatives/right-of-centre people that luck or talent (and, in the case of Norway, hard work) determine an individual's income, which also contributes to explain why those with a conservative/right-of-centre political leaning demand less redistribution than those with a liberals/left-of-centre leaning.

6. Conclusions

We study the redistributive behaviour of meritocrats, who regard inequality in earnings as fair if it reflects differences in performance, in situations where there is uncertainty about who is the best performer. The meritocratic fairness ideal is a prominent fairness ideal in many societies, but to implement it in a straightforward manner requires information about who performs better than others. However, such information is most often not available when redistributive decisions,

[15] About 72% of the American sample define themselves as identifying most strongly with the Republican Party (conservative) or the Democratic Party (liberal); the remainder say either that they identify with another party (7%) or that they do not identify with a party at all (21%). For Norway, we define as right of centre the parties Fremskrittspartiet, Høyre, Venstre and Kristelig Folkeparti, whereas Rødt, Sosialistisk Venstreparti, Arbeiderpartiet, Miljøpartiet De Grønne and Senterpartiet are left of centre. 84% identify with one of these nine parties (those represented in the Norwegian parliament when this study was implemented), whereas the remainder identify with another party (1%) or with no party at all (15.3%).

for example regarding tax and welfare policies, are made in society. We study how meritocrats' redistributive behaviour reacts to such uncertainty. Two large-scale general population surveys of Norwegians and Americans show the broader importance of our framework. We document that people do not believe a high income to be a very reliable signal of superior performance, and that the majority of people are meritocrats.

In a laboratory experiment we use a novel design involving variation in the degree of uncertainty about the source of inequality. We use a simple theoretical framework to show that a meritocrat can exhibit widely different distributive behaviours depending on how she reacts to uncertainty. Specifically, a meritocrat who has a strong relative dislike of making large mistakes will experience a strong egalitarian pull on her behaviour, whereas a meritocrat for whom it is most important to minimize the expected mistake will not. In the laboratory, we find that while meritocrats indeed vary widely in their response to uncertainty, a strong egalitarian pull is the most common response. Thus, we find a previously undocumented source of egalitarian behaviour: uncertainty in combination with meritocratic preferences described by a convex loss function.

In the general population surveys, we provide evidence suggesting that meritocrats in the US and in Norway on average have a convex loss function. The surveys thus establish that uncertainty indeed seems to create an egalitarian pull in distributive behaviour in society. We also identify important differences both between countries and within countries that shed light on why there is more demand for redistribution in Norway than in the US and more demand for redistribution among liberals than among conservatives.

Taken together, the surveys and the laboratory experiment demonstrate how the presence of uncertainty about the source of inequality influences distributive behaviour. We hope that the present study will inspire more work on how uncertainty about the source of inequality shapes

redistributive behaviour. For example, it would be interesting to extend the analysis to cover multi-person situations and to study uncertainty in other distributive contexts, including in employer-employee relationships and in charitable giving. We also believe that a promising avenue for future research would be to extend the analysis to stakeholder situations to study the role of self-serving bias in shaping distributive behaviour under uncertainty. Uncertainty about the source of inequality is inherent in most distributive situations in economics, and thus it is of great importance to further our understanding of how such uncertainty affects people's behaviour.

References

Aaberge, R., A. Björklund, M. Jäntti, M. Palme, P. Pedersen, N. Smith, and T. Wennemo (2002). 'Income inequality and income mobility in the Scandinavian countries compared to the United States', *Review of Income and Wealth*, vol. 48(4), pp. 443–469.

Aarøe, L. and M. B. Petersen (2014). 'Crowding out culture: Scandinavians and Americans agree on social welfare in the face of deservingness cues', *Journal of Politics*, vol. 76(3), pp. 684–697.

Acemoglu, D., J. Robinson, and T. Verdier (2012). 'Can't we all be more like the Scandinavians? Asymmetric growth and institutions in an interdependent world', NBER Working Paper No. 18441.

Alesina, A. and G.M. Angeletos (2005). 'Fairness and Redistribution', *American Economic Review*, vol. 95(4), pp. 960-980.

Alesina, A., E. Glaeser, and B. Sacerdote (2001). 'Why Doesn't the United States Have a European-Style Welfare State?', *Brookings Paper on Economic Activity*, Fall, pp. 187-278.

Alesina, A. and E. Glaeser (2004). *Fighting poverty in the US and Europe: A world of difference*, Oxford, UK: Oxford University Press.

Almås, I., A. W. Cappelen, and B. Tungodden (2020). 'Cutthroat Capitalism versus Cuddly Socialism: Are Americans More Meritocratic and Efficiency-seeking than Scandinavians?', *Journal of Political Economy*, vol. 128(5), pp. 1753-1788.

Andreoni, J. and J. Miller (2002). 'Giving according to GARP: an experimental test of the consistency of preferences for altruism', *Econometrica*, vol. 70(2), pp. 737–753.

Bartling, B., E. Fehr, and K. Schmidt (2012). 'Screening, competition, and job design: Economic origins of good jobs', *American Economic Review*, vol. 102(2), pp. 834–864.

Bartling, B., R. Weber, and L. Yao (2015). 'Do markets erode social responsibility?', *Quarterly Journal of Economics*, vol. 130(1), pp. 219–266.

Bartling, B., A. Cappelen, M. Ekström, E. Sørensen, and B. Tungodden (2018). 'Fairness in Winner-Take-All Markets', NHH Discussion Paper No. 0804-6824.

Benabou, R. and J. Tirole (2006). 'Belief in a Just World and Redistributive Politics', *Quarterly Journal of Economics*, vol. 121(2), pp. 699-746.

Bolton, G. and A. Ockenfels (2000). 'ERC: A theory of equity, reciprocity, and competition', *American Economic Review*, vol. 90(1), pp. 166–193.

Bortolotti, S., I. Soraperra, M. Sutter, and C Zoller. (2017). 'Too Lucky to be True – Fairness Views Under the Shadow of Cheating', CESifo Working Paper No. 6563.

Cappelen, A., T. de Haan, and B. Tungodden (2020). 'Fairness preferences in the face of limited information: are people Bayesian meritocrats?', mimeo, Norwegian School of Economics.

Cappelen, A., C. Cappelen, and B. Tungodden (2018). 'Second-Best Fairness Under Limited Information: The Trade-Off between False Positives and False Negatives', Working Paper, Norwegian School of Economics, No. 18/2018.

Cappelen, A. W., A. D. Hole, E. Ø. Sørensen, and B. Tungodden (2007). 'The pluralism of fairness ideals: An experimental approach', *American Economic Review*, vol. 97, pp. 818-827.

Cappelen, A. W., J. Konow, E. Ø. Sørensen, and B. Tungodden (2013). 'Just Luck: An Experimental Study of Risk-Taking and Fairness', *American Economic Review*, vol. 103, pp. 1398-1413.

Cappelen, A., K. O. Moene, S. Skjelbred, and B. Tungodden (2017). 'The Merit Primacy Effect', NHH Dept. of Economics Discussion Paper, No. 06/2017.

Cappelen, A., Mollerstrom, J, Reme, B-A., and Bertil Tungodden (2021). A Meritocratic Origin of Egalitarian Behavior - Replication package.' ECONOMIC JOURNAL, data deposited at Zenodo, https://doi.org/10.5281/zenodo.5735163.

Cappelen, A. W., E. Ø. Sørensen, and B. Tungodden (2010). 'Responsibility for what? Fairness and individual responsibility', *European Economic Review*, vol. 54(3), pp. 429-441.

Cettolin, E. and A. Riedl (2016). 'Justice under Uncertainty', *Management Science*, vol. 63(11), pp. 3739–3759.

Cettolin, E., A. Riedl, and Tran G. (2017). 'Giving in the Face of Risk', *Journal of Risk and Uncertainty*, vol. 55, pp. 95-118.

Charness, G., U. Gneezy, and A. Henderson (2018). 'Experimental Methods: Measuring Effort in Economics Experiments', *Journal of Economic Behavior and Organization*, vol. 149, pp. 74-87.

Charness, G. and M. Rabin. (2002). 'Understanding social preferences with simple tests', *Quarterly Journal of Economics*, vol. 117(3), pp. 817–869.

Charness, G., T. Gross, and C. Guo (2015). 'Merit Pay and Wage Compression with Productivity Differences and Uncertainty', *Journal of Economic Behavior and Organization*, vol. 117, pp. 233-247.

Durante, R., L. Putterman, and J. van der Weele (2014). 'Preferences for redistribution and perception of fairness: An experimental study', *Journal of the European Economic Association*, vol. 12(4), pp. 1059-1086.

Edlund, J. (1999). 'Trust in government and welfare regimes: Attitudes to redistribution and financial cheating in the USA and Norway', *European Journal of Political Research*, vol. 35(3), pp. 341–370.

Exley, C. (2016). 'Excusing Selfishness in Charitable Giving: The Role of Risk', *Review of Economic Studies*, vol. 83(2), pp. 587-628.

Falk, A. and N. Szech (2013). 'Morals and markets', *Science*, vol. 340(6133), pp. 707–711.

Fehr, E., G. Kirchsteiger, and A. Riedl (1993). 'Does fairness prevent market clearing? An experimental investigation', *Quarterly Journal of Economics*, vol. 108(2), pp. 437–459.

Fehr, E. and K. Schmidt (1999). 'A theory of fairness, competition and cooperation', *Quarterly Journal of Economics*, vol. 114(3), pp. 817–868.

Fischbacher, U. (2007). 'z-Tree: Zurich toolbox for ready-made economic experiments', *Experimental Economics*, vol. 10, pp. 171–178.

Fochesato, M. and S. Bowles (2015). 'Nordic exceptionalism? Social democratic egalitarianism in world-historic perspective', *Journal of Public Economics*, vol. 127, pp. 30–44.

Fong, C. (2001). 'Social Preferences, Self-interest, and the Demand for Redistribution', *Journal of Public Economics*, vol. 82, pp. 225–246.

Fudenberg, D., and D. Levine (2012). 'Fairness, Risk Preferences and Independence: Impossibility Theorems', *Journal of Economic Behavior and Organization*, vol. 81(2), pp. 606-612.

Gärtner, M., J. Mollerstrom, and D. Seim (2017). 'Individual Risk Preferences and the Demand for Redistribution', *Journal of Public Economics*, vol. 153, pp. 49-55.

Gärtner, M., J. Mollerstrom, and D. Seim (2021). 'Income Mobility, Luck vs Effort Beliefs, and the Demand for Redistribution: Perceptions and Reality', Mimeo.

Gurdal, Mehmet Y., J. B. Miller, and A. Rustichini (2013). 'Why blame?', *Journal of Political Economy*, vol. 121 (6), pp. 1205-1247.

Harsanyi, J. (1953). 'Cardinal Utility in Welfare Economics and the Theory of Risk-taking', *Journal of Political Economy*, vol. 61(5), pp. 434-435.

Hufe, P., R. Kanbur, and A. Peichl (2018). 'Measuring Unfair Inequality: Reconciling Equality of Opportunity and Freedom from Poverty', CESifo Working Paper No. 7119.

Jantti, M., B. Bratsberg, K. Roed, O. Raaum, R. Naylor, E. Osterbacka, A. Bjorklund, and T. Eriksson (2006). 'American exceptionalism in a new light: A comparison of intergenerational earnings mobility in the Nordic countries, the United Kingdom and the United States', IZA Discussion Paper No. 1938.

Karadja, M., J. Mollerstrom, and D. Seim (2017). 'Richer (and Holier) than Thou? The Effect of Relative Income Improvements on Demand for Redistribution', *Review of Economics and Statistics*, vol. 99(2), pp. 201-212.

Kleven, H. (2014). 'How can Scandinavians tax so much?', *Journal of Economic Perspectives*, vol. 28(4), pp. 77–98.

Konow, J. (1996). 'A Positive Theory of Economic Fairness', *Journal of Economic Behavior and Organization*, vol. 31, pp. 13–35.

Konow, J. (2000). 'Fair shares: Accountability and Cognitive Dissonance in Allocation Decisions', *American Economic Review*, vol. 90, pp. 1072–1091.

Konow, J. (2005). 'Blind spots: The effects of information and stakes on fairness bias and dispersion', *Social Justice Research*, vol. 18(4), pp. 349-390.

Konow, J. (2009). 'Is Fairness in the Eye of the Beholder? An Impartial Spectator Analysis of Justice', *Social Choice and Welfare*, vol. 33, pp. 101-127.

Krawczyk, M. (2010). 'A Glimpse through the Veil of Ignorance: Equality of Opportunity and Support for Redistribution', *Journal of Public Economics*, vol. 94, pp. 131-141.

Mollerstrom, J., B. Reme, and E. Sørensen (2015). 'Luck, Choice and Responsibility - An Experimental Study of Fairness Views', *Journal of Public Economics*, vol. 131, pp. 33-40.

Niederle, M. and L. Vesterlund (2007). 'Do women shy away from competition? Do men compete too much?', *Quarterly Journal of Economics*, vol. 122, pp. 1067–1101.

Piketty, T. (1995). 'Social mobility and redistributive politics', *Quarterly Journal of Economics*, vol. 110(3), pp. 551–584.

Rawls, J. (1971). *A Theory of Justice.* Cambridge, MA: The Belknap Press of Harvard University Press.

Rogerson, R. (2007). 'Taxation and market work: is Scandinavia an outlier?', *Economic Theory*, vol. 32(1), pp. 59–85.

Saito, K. (2013). 'Social Preferences under Risk: Equality of Opportunity versus Equality of Outcome', *American Economic Review*, vol. 103(7), pp. 3084-3101.

Selten, R. (1967). 'Die Strategiemethode zur Erforschung des eingeschränkt rationalen Verhaltens im Rahmen eines Oligopolexperimentes', In H. Sauermann (ed), Beiträge zur experimentellen Wirtschaftsforschung, Tübingen: Mohr, pp. 136-168.

Stiglitz, J. (2015). ’Leaders and followers: Perspectives on the Nordic model and the economics of innovation’, *Journal of Public Economics*, vol. 127, pp. 3–16.

Zame, W., B. Tungodden, E. Sorensen, S. Kariv, and A. Cappelen (2020). ‘Linking Social and Personal Preferences: Theory and Experiment’, *University of California Berkeley*, mimeo.