Essays on Inequality Acceptance and Meritocracy

Oda Kristine Storstad Sund

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Från genombrott till sammanbrott
Femton sekunder av allt
bob hund[1]

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[1] Translation: From breakthrough to breakdown, Fifteen seconds of everything

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Contents

INTRODUCTION

Growing inequality and its determinants are one of the prominent topics in contemporary discourse, attracting the attention of scholars and policymakers worldwide. The normative theory of equality of opportunity distinguishes between morally acceptable and unacceptable inequalities on the basis of whether they are caused by factors *within individual control* or *circumstances* —external factors for which the individual should not be held accountable (Roemer, 1998). Empirical studies find that most people make the same distinction. When faced with redistributive choices, a majority of people act in line with the meritocratic fairness ideal; tolerating higher levels of inequality when the inequality reflects differences in merits compared to if the inequality is caused by brute luck (Almås et al., 2020; Cappelen et al., 2007).

As most people tend to hold this meritocratic fairness ideal, people's *beliefs* about the source of inequality play a crucial role. Research consistently finds that beliefs about the source of economic inequality correlates with preferences for redistribution, in that people who tend to believe that economic inequality is caused by differences in effort (as opposed to luck) are generally less in favor of redistribution (Alesina and Angeletos, 2005; Alesina and Glaeser, 2004; Fong, 2001; Hvidberg et al., 2021).

Reiterating the theory of equality of opportunity, Roemer (1998) argues that for inequalities to reflect differences in merit, and thus be deemed as morally acceptable, people must have equal opportunities. Although many may support and strive for the ideal of equal opportunities, the ideal can easily come in conflict with other considerations. The weight people place on fairness ideals relative to other considerations has also—as beliefs and the fairness ideal itself—been found to vary between people (Bolton and Ockenfels, 2000; Cappelen et al., 2013; Fehr and Schmidt, 1999).

Major questions about inequality acceptance still remains unanswered: what is the role of religion for the tolerance of inequality? Can the individual characteristics of people in different countries help us understand how they make redistributive decisions? How do familial relations interact with meritocratic fairness views, and how do parents trade off the principle of equal opportunities to giving their child an

advantage? And, how are people's beliefs about the source of inequality affected by their own confidence and experience of success and failure?

The chapters of this thesis all attempt to inform these debates by providing experimental and correlational evidence directly obtained from large representative surveys, field and online survey experiments. Together, the chapters provide an empirically-grounded and nuanced set of insights that complement and extend existing influential economic research, models, and theories.

Chapter I: Randomness or a higher power?—How religion relates to inequality acceptance

The first chapter is coauthored with Invild Almås, Alexander Cappelen, Erik Ø. Sørensen and Bertil Tungodden, and investigates whether religious people differ from non-religious people in their inequality acceptance and beliefs about the sources of economic inequality. Believing in an almighty higher power preserves a sense of order to the world and may give meaning to events that are otherwise hard to understand (Kay et al., 2008; Laurin et al., 2012a,b). Accordingly, religious people may be more inclined to interpret random events in providential terms, and thus may have a higher tolerance, than the secular have, for inequalities caused by pure luck.

In the study, we utilize the global Fairness Across the World data set. Our sample consists of about 65,000 people from 60 different countries, who have all made consequential redistributive decisions under identical economic environments with full information about the source inequality (either luck or merit) and cost of redistribution.

We find that, compared to non-religious people, religious people are generally less sensitive to the source of inequality; treating inequalities due to luck and merit more alike. The finding is both due to religious people, compared to the non-religious, being more tolerant to inequalities caused by luck *and*, being less tolerant to inequalities reflecting differences in merit. In terms of specific religions, the most striking finding is that Hindus, on average, do not differentiate at all between inequality caused by luck and inequality caused by merit. Our findings are consistent with the idea that the religious are more likely to find luck to be an acceptable source of inequality as they are more inclined to interpret it as meaningful –reflecting God's will. Taken together, our findings suggest that religiosity is strongly related to people's inequality acceptance. However to fully understand how religion shapes inequality acceptance, more work is needed.

Chapter II: Unleveling the playing field? Experimental evidence of parents' willingness to give their children an advantage

In the second chapter, I study whether parents are willing to forego the principle of equal opportunities for all children to benefit their own child in what would otherwise be a meritocratic competition. In collaboration with 24 Norwegian secondary schools, I conduct a large-scale lab-in-the-field experiment. More specifically, I arrange a mathematics competition where students originally have equal opportunities to succeed. However, prior to the competition, I give parents the opportunity to help their child by making their child's math questions easier. Randomly assigning parents to one out of two different treatment conditions, I identify the causal effect that the possibility of another parent unleveling the playing field has on parents' willingness to help their child.

My findings show that parents may undermine originally meritocratic processes, either *deliberately* by giving their child an advantage at the cost of another child's opportunity to succeed, or without intention —believing there is a chance of another parent unleveling the playing field.

Chapter III: Confident winners in a meritocratic world

The last chapter is coauthored together with Kajsa Hansson. It explores how people's beliefs about the source of inequality and preferences for redistribution are affected by confidence and the experience of success and failure.

In a large-scale online experiment we have participants compete against another participant, not knowing whether success will reflect performance or a random draw. They only know that with some unknown probability they compete in a meritocratic competition. By applying the hard-easy effect (Dargnies et al., 2019; Healy and Moore, 2007; Kruger, 1999; Moore and Kim, 2003; Moore and Small, 2007), we manipulate participants' level of confidence in their own relative performance, and hence also their belief about their chance of success given a meritocratic competition. In addition, we also manipulate the outcome of the competition, by randomly drawing a winner. Applying this 2×2 between-subject design, we are able to study the causal impact of increased confidence and the experience of failure or success on meritocratic beliefs and preferences for redistribution.

The study has two main findings. First, we document that increased confidence has a polarizing effect on meritocratic beliefs: Whereas we find no effect of winning in the condition where people on average expect to lose in a meritocratic competition, increasing the level of confidence causes winners to believe that the com-

petition is more likely to be determined by merit compared to losers. Second, we find that the experience of winning significantly decreases the willingness to redistribute, independent of confidence treatment. In conclusion, our findings suggest that whereas confidence is important for understanding the formation of meritocratic beliefs, only the experience of failure and success translates to preferences for redistribution.

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I Randomness or a higher power? –How religion relates to inequality acceptance

RANDOMNESS OR A HIGHER POWER? HOW RELIGION RELATES TO INEQUALITY ACCEPTANCE

Oda K. S. Sund Ingvild Almås Alexander W. Cappelen
Erik Ø. Sørensen Bertil Tungodden*

Abstract

Religious beliefs shape how people view the world and may be of great importance for understanding people's attitudes to inequality. In this study, we investigate whether religious people differ from non-religious people in their inequality acceptance. We utilize the Fairness Across the World data set, which provides individual-level data from 60 countries on both inequality acceptance and religiosity. It allows us to compare how religious and non-religious people across the world make consequential redistributive decisions in identical economic environments, where the source of inequality and cost of redistribution is manipulated. We find that the inequality acceptance of religious individuals is less sensitive to the source of inequality than that of non-religious individuals. These findings hold across definitions of religious affiliation and empirical specifications. Taken together, our findings suggest that religiosity is an important predictor of people's fairness views.

JEL:
Key words: Fairness, preferences, inequality, experiment, beliefs, religion

*Almås: IIES – Institute for International Economic Studies, Stockholm University and NHH Norwegian School of Economics; Cappelen, Sørensen, Tungodden, and Sund: NHH Norwegian School of Economics. We would like to thank Adriana Condarco-Quesada and Gallup. The project was financed by support from the Research Council of Norway through its Centres of Excellence scheme, FAIR project No 262675 and Research Grant 236995, and administered by FAIR-The Choice Lab. The experiment is registered in the Registry for Randomized Controlled Trials operated by the American Economic Association: RCT ID AEARCTR-0000487.

"Now faith is confidence in what we hope for and assurance about what we do not see"

(Hebrew 11:1 (New International Version))

Religion has throughout history been a dominant institution in all societies across the world. Religious beliefs shape people's perceptions of the world, their attitudes and, ultimately, their behavior. Believing in an omnipotent God preserves a sense of order to the world and may give meaning to events that are otherwise hard to understand (Kay et al., 2008; Laurin et al., 2012a,b). In particular, religious people may be more inclined to interpret random events in providential terms, i.e., as meaningful even though humans cannot always see or understand them, and thus may have a higher tolerance than secular people for inequalities that are caused by pure luck.

This paper uses the Fairness Across the World data set, which provides rich individual level data from 60 countries on both inequality acceptance and religiosity. Each of the approximately 65,000 people in our sample have made a consequential redistributive decision in *identical economic environments*. In the design, we control and manipulate the source of inequality and the cost of redistribution, which allows us to identify the nature of people's fairness preferences and their importance relative to efficiency considerations. Hence, we can study whether religious people differ from secular people in their fairness views and the weight they attach to fairness relative to efficiency concerns. We also investigate how religiosity relates to beliefs about the sources of inequality and attitudes towards redistribution and to economic inequality.

The main finding of the paper is that religious affiliation is strongly related to people's inequality acceptance. In line with our pre-registered hypothesis, we find that, compared to non-religious people, religious people, accept more inequality on average when the inequality is due to luck.[1] However, religious people also accept less inequality than do non-religious people when inequality is due to a difference in merit. Hence, overall, we find that religious people generally are less sensitive to the source of inequality than are non-religious people. The finding is robust across different definitions of religious affiliation and empirical specifications. In terms of specific religions, the most striking finding is that Hindus, on average, do not differentiate at all between inequality due to luck and inequality due to merit. Our findings are consistent with the idea that the religious are more likely to find luck

[1]The experiment and main hypothesis is registered in the Registry for Randomized Controlled Trials operated by the American Economic Association: RCT ID AEARCTR-0000487.

to be an acceptable source of inequality since they are more inclined to interpret it as reflecting God's will.

In terms of beliefs about the sources of economic inequality in their respective countries, we find that religious people tend to attribute economic success to factors *within* individual control do non-religious people. Consistent with this, we find that religious individuals, on average, perceive the economic inequalities in their respective countries to be less unfair. However, this result is less robust than our main finding, since we do not find a similar difference between religious and non-religious people when comparing those who consider religion an important part of their daily life and those who do not. In terms of policy preferences, we find some evidence that religious people are more supportive of redistribution than are non-religious people, which we argue likely indicate that considerations other than fairness, particularly compassion, shape their policy attitudes.

This study of inequality acceptance elicited through individuals' real redistributive behavior contributes to the growing literature studying the influence of religion on individual behavior using economic experiments (Hoffmann, 2013) and, more generally to the large body of literature examining the link between religion and social preferences. In the existing literature, religion is often linked to prosociality, and it has been proposed that it has been important for the evolution of the norms and institutions sustaining cooperation, fairness, and reciprocity in large-scale societies (Henrich et al., 2010). However, although studies relying on self-reported measures often conclude that religious people are more prosocial (Campbell et al., 2003; Koenig et al., 2007; Monsma, 2007; Smidt, 1999), evidence based on economic experiments suggests that the relationship is, at best, weak, lacking robustness and replicability (Ahmed, 2009; Benjamin et al., 2010; Chuah et al., 2011; Eckel and Grossman, 2004; Hoffmann, 2013; Shariff and Norenzayan, 2007; Tan, 2006). Compared with non-religious people, religious people have also been found to, on average, exhibit less universal preferences and beliefs (Enke et al., ming).

Studying how religion relates to inequality acceptance at the individual level, we contribute to the literature on individual-level determinants of inequality acceptance and preferences for redistribution (Almås et al., 2020; Cappelen et al., 2007; Konow, 2000), and particularly to the recent literature on the influence of religion on redistributional preferences. Whereas the latter literature generally finds the relationship between religiosity and support for the welfare state to be negative (Alesina et al., 2001; Chen and Lind, 2019; Elgin et al., 2013), the evidence concerning the relationship between religiosity and demand for redistribution is more

mixed. Some studies find a negative relationship between religiosity and support for redistribution (Kirchmaier et al., 2018; Neustadt, 2011; Pitlik and Kouba, 2013; Scheve et al., 2006; Stegmueller, 2013; Stegmueller et al., 2012), while other studies find evidence of the relationship being positive (Beery and Ben-Nun Bloom, 2015) and highlight how different dimensions of religiosity may have different effects on the support of redistribution (Arikan, 2013; Arikan and Ben-Nun Bloom, 2019; Graham and Haidt, 2010; Jordan, 2014; Neustadt, 2011; Tan, 2006).

The paper also relates to the literature studying how religion shapes beliefs and individual behavior. In line with the "just world hypothesis" (Lerner, 1980), Bénabou and Tirole (2006) show that a belief in divine rewards and punishments in the afterlife make religious individuals work harder and in turn demand less redistribution. Guiso et al. (2003) find evidence to support this, documenting how religious people believe to a higher degree that success can be achieved through hard work, that poverty can be attributed to laziness, and that some inequality is required to provide an incentive for effort. We contribute to this literature by studying how religious and non-religious people differ with in their beliefs regarding the sources of economic inequalities.

The paper is structured as follows: section 1 provides a description of the data and experimental design, section 2 outlines the main empirical specification of the empirical analysis, Section 3 provides the empirical results, and section 4 the corresponding discussions of our findings and contributions.

1 Data description

The study uses the Fairness Across the World data set which was implemented as a module in the Gallup World Poll in 2018. The data set consists of responses from 65,800 participants from 60 different countries.[2] Based on observables, we have representative samples from each country, and our study covers approximately 80% of the world population.

The following sections describe some important variables of interest and our

[2]The countries are Afghanistan, Algeria, Argentina, Australia, Bangladesh, Bolivia, Brazil, Cameroon, Cambodia, Canada, Chile, China, Colombia, Croatia, Czech Republic, Ecuador, Egypt, Estonia, Ethiopia, France, Germany, Greece, Hungary, Indonesia, India, Iran, Israel, Italy, Japan, Jordan, Kazakhstan, Kenya, Malawi, Mexico, Morocco, Netherlands, Nigeria, Norway, Pakistan Peru, Philippines, Portugal, Russia, Rwanda, South Africa, South Korea, Spain, Sri Lanka, Switzerland, Tanzania, Thailand, Turkey, Ukraine, Uganda, United Kingdom, USA, Venezuela, Vietnam, Zambia, and Zimbabwe.

main model specification for the main analysis.[3]

1.1 Religiosity

We measure religiosity at the individual level at both the *extensive* margin and the *intensive* margin.[4] The *extensive* measure of religiosity is an indicator variable taking the value 1 if a participant states belonging to a religion and the value 0 if a participant reports to be secular or non-religious. To study differences across religions, we also use a categorical variable in parts of the analysis, indicating whether the participant is Christian, Muslim, Hindu, Buddhist, Jewish, belongs to a religion other than the five major religions, or is non-religious/secular. Religious affiliation is considered sensitive in China and Australia and thus was not recorded, which means that this variables is lacking for 3,637 individuals (2.46% of the total sample). As a measure of religiosity, we use the *intensive* measure of religion. The *intensive* measure of religion is an indicator of whether or not a participant considers religion to be an important part of their daily life.[5] The intensive measure is considered sensitive in Egypt, Morocco, Jordan, Vietnam, and Algeria and therefore not recorded, amounting to 5,015 individuals (7.62% of the total sample).

[Figure 1 about here]

Figure 1 shows the proportion of religious people in the population in the respective countries (extensive margin). We observe large variation in religiosity across the world, with the large majority being religious in most countries and only a minority in a few; namely Japan and the Czech Republic with 36.65% and 43.38% of the population being defined as religious by the use of the extensive measure, respectively. The first row in Table 1 gives an overview of the share of people in our sample that belong to the different religious affiliations, as well as the share of people that do not consider themselves as religious. About 90% of the people in our sample consider themselves religious (using the extensive measure). The largest religion in our sample is Christianity (53.9%), followed by Islam (21.9%). Buddhism (6.2%), Hinduism (4.6%), and Judaism (1.4%) are the smallest religions. In addition to being the smallest religion, Judaism is also more country specific, with 94.7% of the Jews in our sample living in Israel. The second row shows the

[3] Detailed information about the survey is provided in Appendix B

[4] The extensive margin and the intensive margin are sometimes referred to as *horizontal* and *vertical* measures of religion (Hoffmann, 2013)

[5] We recognize that many dimensions to religiosity are not captured by our analysis. For a broader overview of how to understand religiosity, see e.g., De Jong et al. (1976).

share of individuals within each category that consider religion to be an important part of their daily life (intensive margin). We note that for all religions, except Judaism, a large majority of people report that religion is important in their daily life. Finally, we note that the two measures largely overlap in their definition of non-religious people; only 6.1% of the individuals who report being non-religious state that religion is an important part of their daily life.

[Table 1 about here]

1.2 Inequality acceptance

To identify individuals' inequality acceptance, all participants act as spectators and are asked to make a consequential redistributive choice for two workers who have completed the same real effort task. They are informed that—in contrast to traditional survey questions—the choice they make determines the final pay of a unique pair of workers.[6] Importantly, the experimental design ensures that all spectators make their choice in *identical economic environments* with complete information about the source of inequality and the cost of redistribution.

Initially, one of the workers is allocated the entire bonus. The spectators are then given the opportunity to redistribute. The spectators face the same choice set: in all three economic environments they can either keep the initial inequality (6,0), redistribute somewhat, or equalize completely. The inequality implemented by spectator i is measured as:

$$e_i = \frac{|\text{Income Worker A}_i - \text{Income Worker B}_i|}{\text{Total Income}} = |1 - 2y_i| \in [0, 1], \qquad (1)$$

where Worker A_i is the worker who initially was allocated the entire bonus. The inequality acceptance measure is equivalent to a Gini coefficient resulting from the distributive behavior of the spectator. The Gini coefficient takes values from 0 to 1.

The experimental design builds on Almås et al. (2020), and has a between-subject design. Participants are randomly assigned to one of three possible treatment conditions: *Luck*, *Merit*, or *Efficiency*. The treatment conditions vary only with respect to the source of the initial inequality and whether or not redistribution is costly. In the *Luck treatment*, one worker is randomly drawn to receive the bonus, whereas in the *Merit treatment* the bonus is assigned to the most productive worker.

[6]The workers are recruited through an online labor market Amazon MTurk, with about 65 800 unique pairs of workers.

In both these treatments no cost is associated with redistribution, whereas in the *Efficiency treatment*, redistribution is costly and causes redistribution to entail an efficiency loss. Since the initial inequality in the *Efficiency treatment* is—as in the *Luck treatment*—caused by a random draw, the *Luck treatment* serves as a natural base condition. The design enables us to study how the source of inequality (luck versus merit) and the cost of redistribution (luck versus efficiency) causally affect individuals' inequality acceptance. In all treatments, the Gini is 1 if the spectator does not redistribute, 0.5 if the spectator partly redistributes, and 0 if the spectator completely equalizes the income between the two workers.

1.3 Beliefs about the main causes of economic inequality and policy attitudes

To identify beliefs about the source of economic inequality, participants are asked a series of questions concerning potential reasons for why the rich are richer than the poor in their country. Respondents are asked to answer a subset of questions on their beliefs about the source of inequality (three to four out of eight questions). The belief questions assigned to each individual is randomized at the point of contact and, importantly, independent of any information about the respondent, allowing us to treat the missing data issue as "missing completely at random" (Little and Rubin, 2002).

The belief questions can be categorized as factors within or beyond individual control. This categorization relates to the normative literature on the responsibility cut (Fleurbaey, 2008; Roemer, 1998), where it is typically argued that individuals should only be held responsible for factors within individual control (Cappelen et al., 2010). Questions regarding factors within individual control ask to what extent the participants believe the rich i) have worked harder in life, ii) have been more selfish in life, iii) are more willing give up something today to benefit from that in the future, iv) are more willing to take economic risks, and v) have been more involved in illegal activities than the poor. The questions concerning factors outside individual control ask participants to what extent they believe the rich i) have had more luck in life, ii) were born with greater abilities, and iii) have parents or other family members that provided them with greater opportunities than the poor. For all belief questions, participants are asked to answer on a five point scale from "strongly disagree" (1) to "strongly agree" (5).[7]

[7]For a detailed description of elicitation and numeric coding of variables, see Appendix B.

Finally, we ask them two policy attitudes questions. First, we ask them to which degree they find the economic inequalities of their country unfair and, second, the extent to which they support redistribution.

2 Empirical strategy

In the empirical analysis, we report different regression specifications. The main specification is as follows:

$$E_{ci} = \alpha + \beta_1 m_{ci} + \beta_2 f_{ci} + \beta_3 r_{ci} + \beta_4 m_{ci} \times r_{ci} + \beta_5 f_{ci} \times r_{ci} + \gamma \mathbf{X}_{ci} + \theta_c + \epsilon_{ci}, \quad (2)$$

with E_{ci} being the level of inequality implemented by individual i in country c, m_{ci} and f_{ci} are indicator variables for i being randomized into the *merit* or *efficiency* treatment, r_{ci} is an indicator variable for whether or not the person is religious (extensive margin) or considers religion to be important in daily life (intensive margin), θ_c is the country fixed effect, and $\mathbf{X}_{ci}$ a vector of individual level explanatory variables: the household's income rank within the country, level of education, gender (female), age, the number of children in the household, and indicators for being married, living in an urban area, immigrant status, and being employed.[8] The *luck* treatment condition is used as the base condition. Being non-religious is used as the base for religious identity when studying the extensive margin, and not considering religion to be an important part of daily life is used as base when studying the intensive margin. In one specification, we also combine the extensive measure and intensive measure by only including those who report being religious and within this subsample we estimate the effect of considering religion to be an important part of daily life. Standard errors are clustered at the primary sampling unit level and the data is reweighted to be nationally representative for each country by applying the population weights provided by the Gallup World Poll 2018.[9]

In the analysis, we also report several alternative regression specifications. First, when studying the extensive margin, we report a version of equation (2) with indicator variables and interaction terms for each religion. Second, we report separate regressions estimating the treatment effects for religious and non-religious individuals, using both the intensive and the extensive margins, and corresponding regressions estimating treatment effects for each religion. Third, we report regressions of

[8] See Appendix B for a detailed description of our measurement of household income rank.

[9] For a detailed description of the primary sampling unit in respective countries, see Appendix B.

beliefs and policy attitudes on the extensive or the intensive margin.

3 Results

This section consists of three parts: studying inequality acceptance, beliefs about the source of inequality, and policy attitudes, respectively.

3.1 Inequality acceptance

We first consider how religious and non-religious people differ in their overall inequality acceptance. In the left and middle panels of Figure 2, we compare implemented inequality pooled for all treatments. For the intensive measure of religiosity, we observe that those who consider religion an important part of their daily life accept on average slightly more inequality compared to those who do not consider religion an important part of everyday life (1.30 percentage points, $p = 0.037$), and the difference is slightly larger and remains significant when using the extensive measure (2.03 percentage points, $p = 0.007$). However, in the right-hand panel, we observe large differences in inequality acceptance across the different religions. On average, Christians, Muslims, Hindus, and Buddhist all implement more inequality than the non-religious people do ($p < 0.01$ for Hinduism and Islam, $p = 0.187$ for Christian), but Jews, on average, implement significantly less ($p < 0.01$). Hindus implement most inequality, almost 43% more than non-religious people and 60% more than Jews.

[Figure 2 about here]

In Figure 3, we report implemented inequality by treatment for both the extensive and the intensive margin. We observe that religious people implement more inequality than do non-religious people when the source of inequality is luck, both when there is no cost and when there is a cost of redistribution. At the same time, we find that religious people implement less inequality than non-religious people do in the merit treatment for both the extensive and the intensive margin ($p < 0.01$ in all comparisons). We observe a large treatment effect of manipulating the cost of redistribution for both religious and non-religious people ($p < 0.01$ in all comparisons), and a much smaller treatment effect of manipulating the source of inequality for both groups ($p < 0.01$ in all comparisons). However, we also observe that the treatment effect caused by the source of inequality is substantially larger for non-religious than for the religious.

[Figure 3 about here]

In Figure 4, we report the average implemented inequality by treatment for each religion. We observe that people of all religions, except for Jews, implement significantly more inequality in the luck treatment than do non-religious people ($p < 0.01$ in all comparisons). In particular, we observe that Hindus implement almost twice as much inequality as do non-religious people when the source of inequality is luck. The same pattern holds when there is a cost of redistribution. However, we also observe that none of the religious groups implements more inequality than the non-religious group when the source of inequality is merit, and some of the religious groups (Buddhists and Jews) implement significantly less ($p < 0.01$).

We further observe from Figure 4 that the treatment effect of manipulating the source of inequality is robust across religions, except for Hinduism. Strikingly, among Hindus we observe almost the same level of implemented inequality for both the merit and the luck treatment. In terms of the efficiency treatment effect, we observe that it is comparatively small in all religions. In Table 3, we show that the estimated treatment effect of the source of inequality is highly robust for all religious affiliations, except for Hinduism. We also observe that the estimated efficiency treatment effect is significant for Christians, Muslims and Buddhists, but not for Hindus or Jews.

[Figure 4 about here]

[Table 3 about here]

In Table 4, we report the main specification on inequality acceptance, where we test whether the treatment effects differ across religious and non-religious people. In column (1), we observe that estimated interaction effect between the extensive measure of religiosity and the source of inequality is negative and highly significant ($p < 0.01$). This shows that religious people are significantly less sensitive to the source of inequality than are non-religious people. In column (2), we show that this finding is robust to using the intensive measure of religiosity, and in columns (3)–(4) we show that it is also robust to excluding countries in which we do not have complete data on religiosity. In column (5), we exclude non-religious people (as defined by the extensive measure) from the sample, and show that the source of inequality is more important for religious people who state that religion is important in their daily life than for religious people who don't state that religion is important. Hence, the analysis provides robust evidence for religion making people less sensitive to

the source of inequality. In terms of the efficiency treatment effect, we observe that religious people are slightly more sensitive to the source of redistribution, but this finding is only statistically significant in some of the specifications.

[Table 4 about here]

In Figure 5, we report the interaction effects separately for each religion. We observe that the estimated treatment effect of the source of inequality is large and statistically significant for all religious groups ($p < 0.01$), which provides further evidence of religion making people less sensitive to the source of inequality. At the same time, we observe that the efficiency treatment effect is not significant for any of the religions.

[Figure 5 about here]

3.2 Beliefs about the sources of economic inequality and policy attitudes

We now turn to studying the relationship between religiosity and beliefs about the sources of inequality and policy attitudes.

Table 5 reports regression estimates of how religious and non-religious people differ in their beliefs about the underlying sources of economic inequality in their country. In columns (1)–(10) we study factors that could be considered to be within individual control, while in columns (11)–(16) we study factors that should be considered outside individual control. The table reports estimates for both the extensive measure and the intensive measure of religiosity, always including background variables and country fixed effects.[10]

We observe from columns (1)–(10) that religious people largely seem to be in more agreement with inequality reflecting factors within individual control than are non-religious people, but this difference is in many cases not significant and in most cases sensitive to whether we use the extensive or the intrinsic measure. Only for the question about whether the rich are richer than the poor in their country because work harder in life do we find robust evidence that religious people are more in agreement, and in Table 7 in Appendix A we show that this finding is also highly robust across religious affiliations, except for Judaism. In terms of factors beyond individual control, we observe from columns (11)–(16) that the only difference that

[10] We also asked the participants about their beliefs about the cost of redistribution, but find no evidence of a difference between religious and non-religious people on this dimension.

is robust to both definitions of religiosity is that religious people, on average, believe that differences in background opportunities are not a main source of inequality in their society. However, in Table 7 in Appendix A, we show that this finding is not robust across the different religions, where for example Jews seem to be more inclined than non-religious people to consider background opportunities to be an important source of inequality.

In Table 6, we study how religiosity relates to whether people find inequality in their society to be unfair and support redistribution. In line with religious people more strongly believing that hard work is an important source of inequality, we find that they are less likely to consider inequality in their society to be unfair when using the extensive measure. However, this result is not robust to using the intensive measure, and in Table 8 in Appendix A we also show that it is not robust across religions. Only Christians are significantly less likely than non-religious people to consider inequality in their society to be unfair.

In terms of policy preferences, we find evidence of religious people being more in favor of redistribution than are non-religious people when using the intensive measure, but not when considering the extensive measure. As shown in Table 8 in Appendix A , we also do not find a robust pattern of policy support for redistribution across religions. Finally, we find that the correlation between considering inequality unfair and support for redistribution is lower for religious people than for non-religious people (extensive margin: 0.394 versus 0.456; intensive margin: 0,379 versus 0.423).

4 Concluding remarks

We have reported from a large-scale global study of how religiosity relates to inequality acceptance, beliefs about the source of inequality, and policy attitudes. We show that religious people across all the main religions are significantly less sensitive than non-religious people to whether the source of inequality is luck or merit. Further, we show that this lack of sensitivity reflects that religious people are more accepting of inequality due to luck, but not of inequality due to merit. This finding is in line with our pre-specified hypothesis that religious people are more inclined to interpret random events in providential terms.

The differences between religious and non-religious people are less pronounced in terms of beliefs about the source of inequality and policy attitudes. We find evidence of religious people to a greater extent considering hard work to be a main

source of inequality in their society, and some suggestive evidence of religious people being more in support of redistribution. These two findings may seem to conflict, but could suggest that the policy preferences of religious people are driven by other considerations than fairness to a greater extent than for non-religious people. In particular, compassion is a core element in all the major religions and may be more important for religious people's political attitudes than fairness considerations. In Figure 6, we show that religious people in our data set indeed donate more to charity, volunteer more time, and are more likely to help a stranger than are non-religious people, and these patterns are largely robust across the different religions. Hence, religious people may be more supportive of redistribution because they are more compassionate about the needs of others in society.[11]

[Figure 6 about here]

The present study suggests that religiosity shapes inequality acceptance, but more work is needed to fully understand the underlying mechanisms and differences across religions. The acceptance of inequality due to luck may reflect respect for an almighty God, but at the same time be seen in meritocratic terms in Hinduism through the notion of karma reflecting an earned realization based on past behavior. Future research should explore in more depth these different religious narratives and the relationship between fairness and compassion in determining people's inequality acceptance and attitudes. Given the power of religion, we need a better understanding of how it shapes our behavior and policies.

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[11] However, the measurements reported in Figure 6 are based on self-reported measures. See e.g., Hoffmann (2013) why self-reported measures may be problematic when studying differences between religious and non-religious people.

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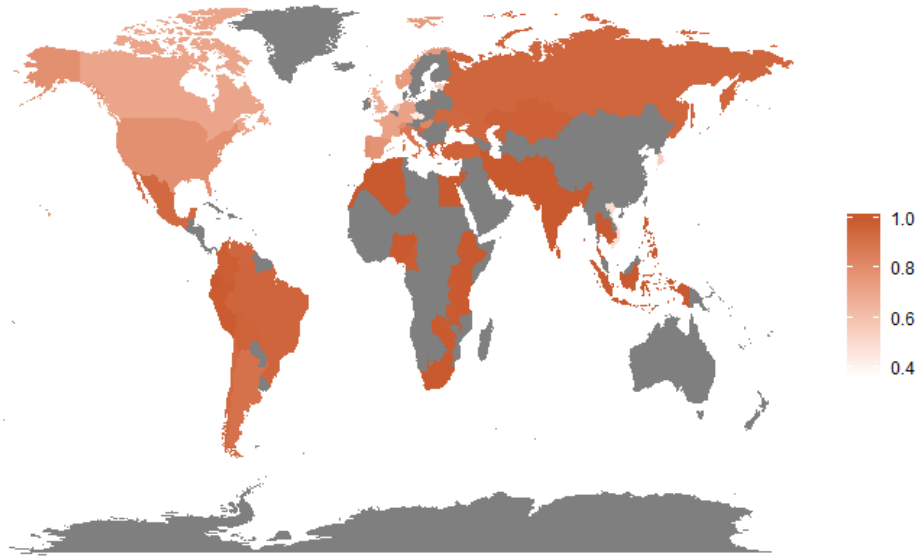
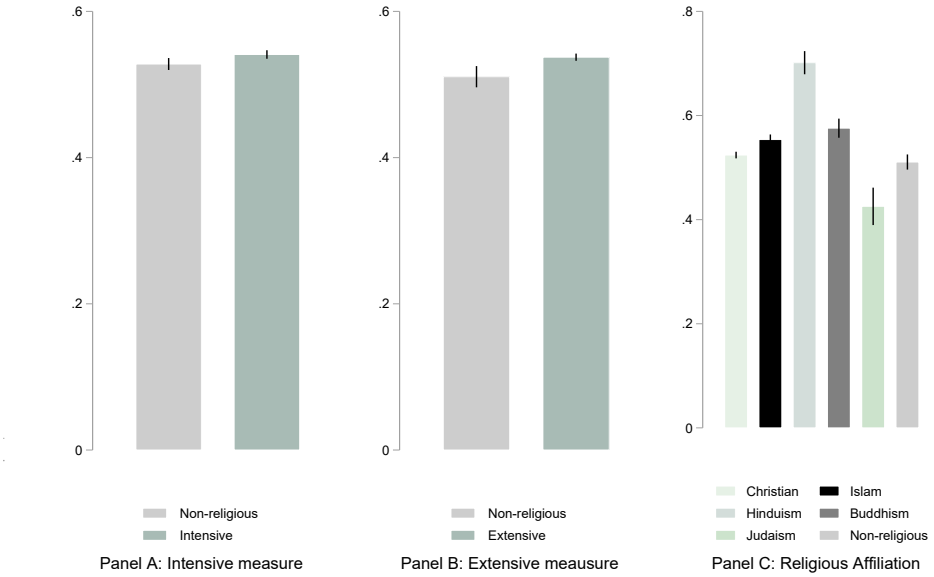
5 Tables and Figures

Figure 1: Proportion identifying as religiously affiliated



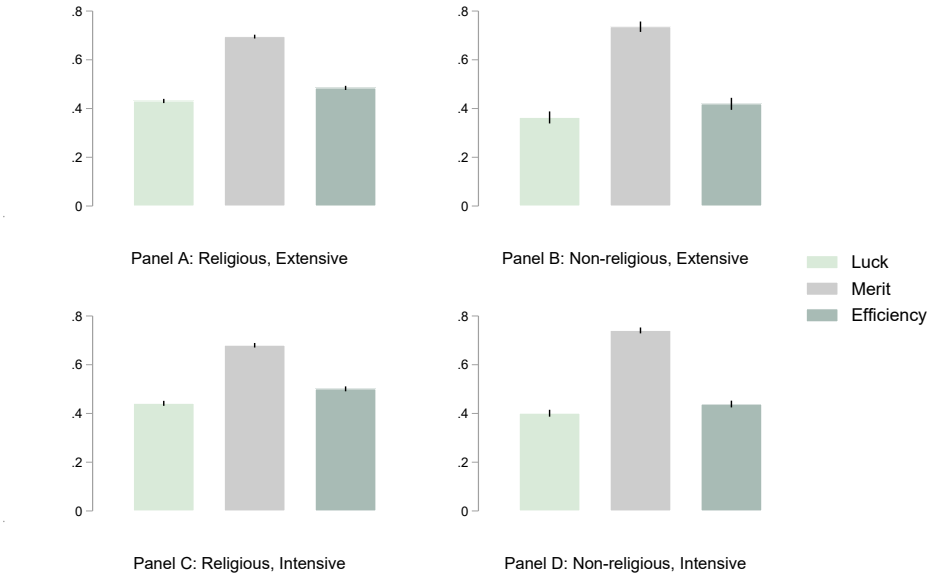
Note: The map shows the proportion of a country's population who is defined as religious according to the *extensive* measure of religion as defined in Section 1.1. The darker the shade, the higher the proportion of religious individuals.

Figure 2: Estimated average level of implemented inequality for the non-religious and the religious



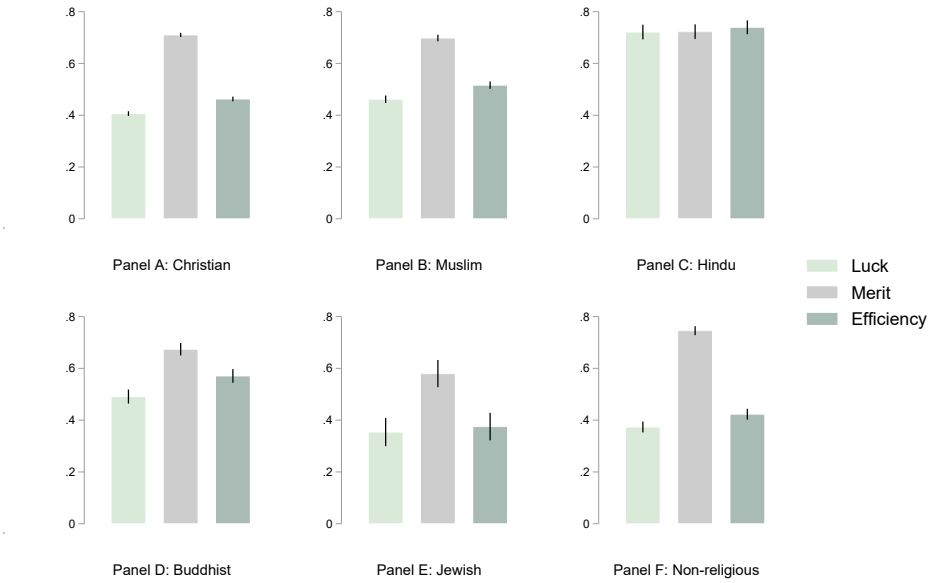
Note: The figure reports average implemented level of inequality, where inequality is measured by the implemented gini coefficient measured as in Equation 1. Panel A reports the average level of implemented inequality for the religious and non-religious using the *Intensive* measure, Panel B using the *Extensive* measure (both as defined in Section 1.1), and Panel C reports the estimated average level of inequality implemented for the non-religious and the different religious affiliations. Error bars reports the 95% confidence intervals, and the differences are estimated without individual level controls or country fixed effects.

Figure 3: Average implemented level of inequality for each treatment condition estimated for extensive and intensive measure of religious and non-religious



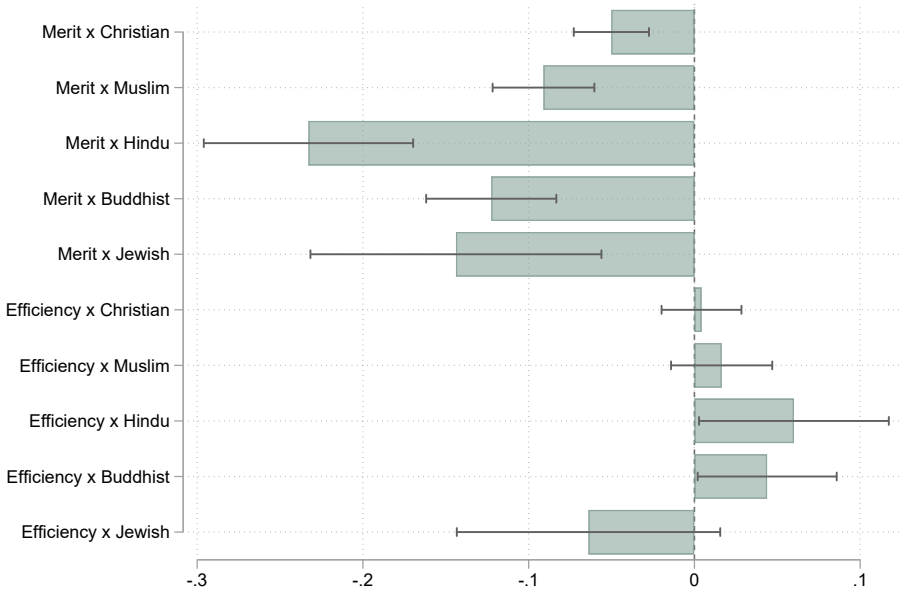
Note: The figure shows the average implemented level of inequality (measured by the implemented gini coefficient as in Equation 1) in the luck, merit, and efficiency treatment estimated separately for being defined as: religious as defined by the exensive measure (Panel A), non-religious as defined by the extensive measure (Pabel B), religious as defined by the intensive measure (Pabel C), non-religious as defined by the entensive measure (Pabel D). The error bars marks the 95% confidence intervals.

Figure 4: Average implemented level of inequality for each treatment condition estimated for each religious affiliation



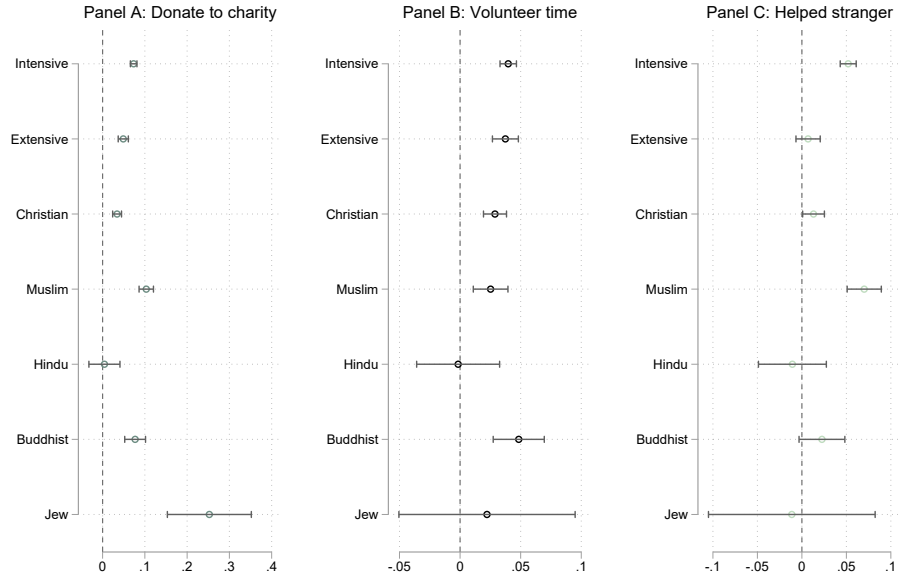
Note: The figure shows the average implemented level of inequality (measured by the implemented gini coefficient as in Equation 1) in the luck, merit, and efficiency treatment estimated separately for each religious affiliation; panel A for Christians, panel B for Muslims, panel C for Hindus, panel D for Buddhist, panel E for Jewish, panel F for non-religious. Error bars marks the 95% confidence intervals.

Figure 5: Estimated treatment differences in inequality acceptance between non-religious and the different religious affiliations



Note: The figure reports the regression estimates for the estimated treatment difference between the non-religious and those belonging to the different religious affiliations. The dependent variable is the implemented gini coefficient, measured as in Equation 1. The regression model is specified in Equation 2, controlling for country fixed effects and the vector of individual controls listed in in Table 2. The standard errors are indicated by the bars.

Figure 6: Estimated differences in self-reported charitable behavior between the non-religious and the different religious affiliations



Note: The figure reports the estimated differences in self-reported charitable behavior between the non-religious and the religious estimated separately using the extensive measure, intensive measure, and for different religions. The dependent variable in panel A is "Donate to charity" taking the value 1 if the respondent has donated to charity in the past month. The dependent variable in panel B is an indicator variable, taking the value 1 if the participant reports having volunteered his or her time, and 0 otherwise. The dependent variable in panel C is an indicator variable taking the value 1 if the participant reports having helped a stranger within the past month, and 0 otherwise. All estimated differences include country fixed effects and the vector of individual control variables listed in Table 2. Robust standard errors, clustered at the primary sampling level, are indicated by the bars.

Table 1: Overview of religious affiliation

	Christianity	Islam	Hinduism	Buddhism	Judaism	Secular	Other
% Sample	53.9	21.9	4.6	6.2	1.4	10.0	1.9
% Important	71.7	60.6	79.3	73.8	41.9	6.1	58.4

Note: The table reports an overview of the religious affiliation of our sample. The first row reports the share of our sample affiliated with the respective religion (or non-religious/ secular). The second row reports the share belonging to the respective group that considers religion an an important part of their daily life.

Table 2: Treatment effects on inequality acceptance for religious and non-religious

	Extensive measure		Intensive measure	
	(1)	(2)	(3)	(4)
	Religious	Non-religious	Religious	Non-religious
Merit	0.262***	0.385***	0.255***	0.400***
	(0.006)	(0.017)	(0.007)	(0.017)
Efficiency	0.055***	0.064***	0.055***	0.061***
	(0.006)	(0.017)	(0.006)	(0.018)
Control variables	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
Observations	51554	5814	47205	5363
R^2	(0.109)	(0.210)	(0.099)	(0.197)

Note: The table reports the estimated treatment effects, estimated for each being defined as religious or non-religious by the *Extensive* and *Intensive* measure separately. The dependent variable is the implemented gini coefficient (measured as in Equation 1). "Merit" is an indicator variable, taking the value one if the individual is randomly assigned to the Merit treatment, and "Efficiency" is an indicator variable, taking the value one if the individual is randomly assigned to the Efficiency treatment. The Luck treatment serves as base. All estimates are estimated including country fixed effects and the vector of individual control variables listed in Table 2. Robust standard errors, clustered at the primary sampling unit level, are reported in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 3: Treatment effects on inequality acceptance by religious affiliation

	Christianity	Islam	Hinduism	Buddhism	Judaism	Non-religious	Other
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Merit	0.290***	0.235***	0.023	0.194***	0.210***	0.385***	0.322***
	(0.008)	(0.013)	(0.026)	(0.023)	(0.052)	(0.017)	(0.041)
Efficiency	0.056***	0.054***	0.040	0.075***	0.017	0.064***	0.056
	(0.008)	(0.011)	(0.026)	(0.022)	(0.045)	(0.017)	(0.045)
Control variables	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓
Observations	30585	12805	2657	3600	841	5814	1066
R^2	(0.116)	(0.108)	(0.074)	(0.111)	(0.072)	(0.210)	(0.192)

Note: The table reports the estimated treatment effects, estimated for each religious affiliation separately. The dependent variable is the implemented gini coefficient (measured as in Equation 1). "Merit" is an indicator variable, taking the value one if the individual is randomly assigned to the Merit treatment, and "Efficiency" is an indicator variable, taking the value one if the individual is randomly assigned to the Efficiency treatment. The Luck treatment serves as base. All estimates are estimated including country fixed effects and the vector of individual control variables listed in Table 2. Robust standard errors, clustered at the primary sampling unit level, are reported in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 4: Treatment effects on inequality acceptance: Interaction analysis

	(1)	(2)	(3)	(4)	(5)
Merit	0.386***	0.339***	0.401***	0.342***	0.323***
	(0.017)	(0.010)	(0.017)	(0.010)	(0.013)
Extensive	0.057***		0.063***		
	(0.014)		(0.014)		
Merit × Extensive	-0.124***		-0.146***		
	(0.018)		(0.018)		
Efficiency	0.064***	0.039***	0.061***	0.041***	0.035***
	(0.017)	(0.010)	(0.018)	(0.010)	(0.013)
Efficiency × Extensive	-0.009		-0.006		
	(0.018)		(0.019)		
Intensive		0.006		0.004	-0.010
		(0.010)		(0.010)	(0.012)
Merit × Intensive		-0.102***		-0.106***	-0.088***
		(0.012)		(0.012)	(0.015)
Efficiency × Intensive		0.021*		0.020	0.026*
		(0.012)		(0.013)	(0.015)
Control variables	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓
Observations	57368	57715	52568	53421	46719
R^2	(0.119)	(0.117)	(0.110)	(0.112)	(0.102)

Note: This table reports the regression estimates based on Equation 2. The dependent variable is the implemented inequality, measured by the gini coefficient as in Equation 1. "Extensive" is an indicator variable, taking the value one if the respondent report to be affiliated with a religion, and zero otherwise. "Intensive" is also an indicator variable, taking the value one if the individual reports that their religion is an important part of their daily life, and zero otherwise. Column (1) drops countries where the extensive measure is missing, column (2) drops countries where the intensive measure is missing, and columns (3)–(5) drops countries where either measure is missing. Column (5), is in addition stratified on being defined as religious by the extensive measure. For the respective countries, see Table B.1. All estimates are estimated including country fixed effects and the vector of individual control variables listed in Table 2. Robust standard errors, clustered at the primary sampling unit level, are reported in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 5: Beliefs about the source of inequality: Religious versus non-religious people

	Within individual control										Outside individual control					
	(1) Effort	(2) Effort	(3) Selfish	(4) Selfish	(5) Patient	(6) Patient	(7) Risk	(8) Risk	(9) Illegal	(10) Illegal	(11) Luck	(12) Luck	(13) Abilities	(14) Abilities	(15) Opportunities	(16) Opportunities
Extensive	0.167***		0.014		0.128***		0.059		0.035		0.056		0.050		-0.078**	
	(0.034)		(0.046)		(0.044)		(0.044)		(0.042)		(0.039)		(0.038)		(0.035)	
Intensive		0.089***		0.025		0.054		0.076**		0.098***		0.048*		0.067**		-0.058**
		(0.027)		(0.032)		(0.033)		(0.032)		(0.032)		(0.029)		(0.028)		(0.028)
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
N	28324	28546	21942	22242	21495	21605	21806	21963	21294	20753	28087	28327	27981	28205	22433	22608
r2	0.137	0.137	0.072	0.077	0.076	0.070	0.057	0.053	0.152	0.158	0.068	0.064	0.146	0.114	0.067	0.063

Note: The table reports the estimated differences in beliefs about the source of inequality between the non-religious and the religious. Odd-numbered columns report estimated differences using the "Extensive measure" of religion, and Even-numbered columns report the differences using the Intensive measure, both defined in Section 1.1. Belief variables are defined in Section B.4 and are coded numerically 1–5 with 5 being strong agreement. "Effort" measures agreement with the statement that the rich got ahead by hard work, "Selfish" by being selfish, "Patient" by being patient, "Risk" by taking risks, "Illegal" by illegal activities, "Luck" by being lucky, "Abilities" by having greater abilities, and "Opportunities" by the rich getting more opportunities through family connections. All estimates are estimated including country fixed effects and the vector of individual control variables listed in Table 2. Robust standard errors, clustered at the primary sampling unit level, are reported in parentheses. *$p < .1$, *$p < .05$, *$p < .01$

Table 6: Policy attitudes: Religious versus non-religious people

	Economic inequality unfair					Demand for redistribution				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Extensive	-0.059**		-0.082***			0.002		-0.015		
	(0.026)		(0.026)			(0.024)		(0.024)		
Intensive		-0.018		-0.015	0.014		0.056***		0.064***	0.089***
		(0.019)		(0.019)	(0.020)		(0.017)		(0.018)	(0.018)
Control variables	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Observations	55602	56040	51126	51987	45386	55698	56186	51255	52112	45518
R^2	(0.102)	(0.092)	(0.094)	(0.093)	(0.095)	(0.075)	(0.071)	(0.071)	(0.071)	(0.072)

Columns (1–5) reports the estimated differences where the dependent variable measures the degree to which economic inequality is considered unfair, and columns (6–10) the estimated differences where the dependent variable is the degree to which one thinks the government should aim to reduce economic inequalities. Both dependent variables are coded on a numeric scale 1–5, with 5 being strong agreement. "Extensive" is an indicator variable, taking the value 1 if the respondent self-report to be affiliated with a religion. "Intensive" is a indicator variable, taking the value 1 if the respondent reports that religion is an important part of their daily life. All estimates are estimated including country fixed effects and the vector of individual control variables listed in Table 2. Columns (1) and (6) drops countries where the extensive measure is missing, columns (2) and (7) drops countries where the intensive measure is missing, and columns (3)–(5) drops countries where either measure is missing. Columns (5) and (10), is in addition stratified on being defined as religious by the extensive measure. For the respective countries, see Table B.1. Robust standard errors, clustered at the primary sampling unit level, are reported in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

A Supplementary analysis

Table 8: Regression results estimating differences in the degree to which they find economic inequality unfair and to which degree they think the government should reduce economic inequality

	Economic inequality unfair		Demand for redistribution	
	(1)	(2)	(3)	(4)
Christian	-0.074***	-0.088***	-0.007	-0.019
	(0.027)	(0.029)	(0.025)	(0.025)
Islam	-0.001	-0.021	-0.023	-0.036
	(0.049)	(0.050)	(0.049)	(0.049)
Hinduism	-0.025	-0.050	0.019	0.001
	(0.100)	(0.101)	(0.086)	(0.086)
Buddhism	0.041	-0.015	0.090*	0.053
	(0.057)	(0.064)	(0.051)	(0.055)
Judaism	-0.188	-0.220*	-0.203	-0.212
	(0.124)	(0.124)	(0.133)	(0.133)
Other	-0.083	-0.097	-0.017	-0.029
	(0.064)	(0.066)	(0.057)	(0.058)
Control variables	✓	✓	✓	✓
Country FE	✓	✓	✓	✓
Observations	55602	50653	55698	51255
R^2	(0.102)	(0.094)	(0.075)	(0.071)

Columns (1)–(2) reports the estimated differences where the dependent variable measures the degree to which economic inequality is considered unfair, and columns (3)–(4) the estimated differences where the dependent variable is the degree to which one thinks the government should aim to reduce economic inequalities. Both dependent variables are coded on a numeric scale 1–5, with 5 being strong agreement. "Christian", "Isam", "Hinduism", "Buddhism", "Judaism", and "Other" are indicator variables taking the value 1 if the respondent reports belonging to the respective religion. Non-religious serves as base. All estimates are estimated including country fixed effects and the vector of individual control variables listed in Table 2. Columns (1) and (6) drops countries where the extensive measure is missing, columns (2) and (7) drops countries where the intensive measure is missing, and columns (3)–(5) drops countries where either measure is missing. Columns (5) and (10), is in addition stratified on being defined as religious by the extensive measure. For the respective countries, see Table B.1. Robust standard errors, clustered at the primary sampling unit level, are reported in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 7: Regression results estimating differences in beliefs about the source of inequality

	Within individual control					Outside individual control		
	(1) Effort	(2) Selfish	(3) Patient	(4) Risk	(5) Illegal	(6) Luck	(7) Abilities	(8) Opportunities
Christian	0.126***	-0.002	0.131***	0.050	0.037	0.039	0.016	-0.104***
	(0.036)	(0.048)	(0.047)	(0.046)	(0.044)	(0.041)	(0.040)	(0.037)
Islam	0.516***	0.023	0.276***	0.241***	0.055	0.231***	0.289***	0.100
	(0.073)	(0.077)	(0.076)	(0.076)	(0.077)	(0.074)	(0.075)	(0.070)
Hinduism	0.439***	0.181	0.162	0.077	0.058	0.108	0.111	-0.049
	(0.129)	(0.147)	(0.130)	(0.131)	(0.143)	(0.144)	(0.139)	(0.147)
Buddhism	0.352***	0.150*	0.096	0.063	0.107	0.082	0.230***	0.024
	(0.082)	(0.087)	(0.069)	(0.075)	(0.090)	(0.071)	(0.086)	(0.072)
Judaism	-0.008	-0.288	0.030	0.264	-0.527***	0.628***	-0.177	0.241*
	(0.209)	(0.183)	(0.179)	(0.185)	(0.182)	(0.231)	(0.162)	(0.132)
Other	0.181**	-0.037	0.038	0.038	-0.106	0.089	0.104	-0.012
	(0.086)	(0.103)	(0.101)	(0.112)	(0.101)	(0.089)	(0.086)	(0.093)
Control variables	✓	✓	✓	✓	✓	✓	✓	✓
Country FE	✓	✓	✓	✓	✓	✓	✓	✓
N	28324	21942	21495	21806	21294	28087	27981	22433
r2	0.140	0.072	0.076	0.057	0.153	0.069	0.147	0.068

The table reports the estimated differences in beliefs about the source of inequality between the non-religious the different religions. Columns (1)–(5) reports estimates for differences in belief variables defined as being *within* individual control, and columns (6)–(8) beliefs about source *outside* individual control. Belief variables are defined in Section B.4 and are coded numerically 1–5 with 5 being strong agreement. "Effort" measures agreement with the statement that the rich got ahead by hard work, "Selfish" by being selfish, "Patient" by being patient, "Risk" by taking risks, "Illegal" by illegal activities, "Luck" by being lucky, "Abilities" by having greater abilities, and "Opportunities" by the rich getting more opportunities through family connections. "Christian", "Isam", "Hinduism", "Buddhism", "Judaism", and "Other" are indicator variables taking the value 1 if the respondent reports belonging to the respective religion. Non-religious serves as base. All estimates are estimated including country fixed effects and the vector of individual control variables listed in Table 2. Robust standard errors, clustered at the primary sampling unit level, are reported in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

B Description of data

This appendix presents further details about the data collection, and draws upon a similar appendix in Almås et al. (2022).

B.1 Data collection—infrastructure and selection of countries

We implemented a "Fairness-Across-the-World" module as part of the Gallup World Poll 2018, which is a probability based and nationally representative sample of the resident adult (aged 15 and older) population Gallup (2018). Our module was implemented in 60 countries, with a median of 1000 respondents in each country and, in total, 65,856 observations. One person, drawn at random, was interviewed in each sampled household. In countries with 80% phone coverage or where phone interviews are customary, interviewing took place by telephone (15 countries), in the remaining countries interviews were face-to-face. Face-to-face interviews were clustered, with sampling procedure varying with the amount of information available in each country. We cluster at the level of primary sampling units (PSUs), see discussion of weighting in Section B.8.

Table B.1 accounts for how many respondents were sampled in each country, what languages and which modes of interviewing were used, and the exceptions to random sampling from the full population (mostly because of internal conflicts and very sparse population).

B.2 Main outcome variable

In this subsection we describe the three main outcome variables used in the analysis, the implemented inequality in three different (between individual) treatments.

The question was posed as follows, with two texts that varied by treatment (referenced below as "A" and "B") provided in Table B.2.

> I am now going to ask you to make a decision that will decide how two real people are paid for some work they have conducted. You do not know these two individuals, but they will receive the payment that you decide. Recently, these two individuals were hired to do an assignment that could be completed in a short time. They worked independently and did not communicate with each other in any way. They were both paid a compensation for taking part in the work. After they had completed the assignment, they were told that **A** would earn an additional [AMOUNT] for the work on the assignment while the other would not earn anything additional for the work on the assignment. However, they were also told that a third person could change how the additional earnings would be divided between the two of them. You are this third person and it is now up to you to decide whether you want to change how the additional earnings are divided between the

two workers for the work on the assignment. **B** You can choose between some alternatives and whatever you decide will happen; the two individuals will receive what you decide. How do you want to divide the additional earnings? Remember, what you choose will be paid to these two people in real life. Would you (Read 1-2 and repeat question if necessary):

An example of how the choice alternatives were presented:

1. Leave it as it is? They receive their earnings—the one who was randomly selected to earn an additional 60 kroners receives 60 kroners and the other receives no additional money

2. Take SOME of the earnings from the one who was randomly selected to earn an additional 60 kroners and give it to the one who did not earn anything additional. [If this alternative is chosen, then present the two alternatives:]

   (a) Take 15 kroners of the additional earnings from the one who was randomly selected to earn 60 kroners and give it to the one who did not earn anything additional—such that the randomly selected person receives 45 kroners and the other receives 15 kroners.

   (b) Take 30 kroners of the additional earnings from the one who was randomly selected to earn 60 kroners and give it to the one who did not earn anything additional—such that both receive 30 kroners.

The amounts were provided in local currency units. The conversion to local currency units was based on current exchange rates and corrected for local price levels using purchasing power parities (World Bank, 2019). The total amounts were also slightly adjusted to be able to provide choice alternatives that were fairly even numbers (and that could be represented in local currencies notes and coins).

Implementing the bonuses on Amazon mTurk workers based in the United States, bonuses were converted back to USD based on current exchanges rates, and the amount of time the workers spent on the task was scaled such that the bonus amount per time unit was the same for decisions made in each of the Gallup World Poll decisions.

B.3 The measurement of religiosity

Gallup asked a question (known in the World Poll as WP1233) with quite fine detail about the what religion the respondent is affiliated with. This question was not asked in all countries. Among the Fairness-Across-the-World countries, it was not asked in Australia and not in China. We use the provided recoding of this (WP1233Recoded) to the collapsed into five main categories (major religions).

We also use the World Poll variable WP119, "Is religion an important part of your daily life?" Outcomes were coded 1: Yes, 2: No, 3: (DK), 4: (Refused),

For those that were asked this question, we code an indicator variable for 'Yes,' and code it as missing for "don't know," "refused," and for people in countries the question was not asked. Among the Fairness-Across-the-World countries, it was not asked in Algeria, Egypt, Jordan, Morocco, and Vietnam.

Table B.1 shows how many gave valid responses for each of the questions on religiosity by country.

B.4 Other outcome variables

The outcome variable that take the form of an belief in the cause of inequality is the response to the question such as : "Do you generally agree, disagree, or neither agree nor disagree with this statement: In (name of country of the respondent), one of the main reasons for the rich being richer than the poor is that [CAUSE]." In case of agreement/disagreement, a follow up question asks if they agree/disagree "strongly" or "somewhat." Respondents could also choose not to answer or state that they don't know. The degree of agreement is coded numerically 1–5, with 5 being strong agreement and 3 is "neither agree nor disagree."

The questions asked were:

E4 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], one of the main reasons for the rich being richer than the poor is that the rich have worked harder in life than the poor.

E5 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], one of the main reasons for the rich being richer than the poor is that the rich have had more luck in life than the poor.

E6 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], one of the main reasons for the rich being richer than the poor is that the rich were born with greater abilities than the poor.

E8 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], one of the main reasons for the rich being richer than the poor is that the rich have been more selfish in life than the poor.

E9 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], one of the main reasons for the rich being richer than the poor is that the rich are more willing than the poor to give up something today to benefit from that in the future.

E10 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], one of the main reasons for the rich being richer than the poor is that the rich are more willing to take economic risks than the poor.

E11 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], one of the main reasons for the rich being richer than the

poor is that the rich have parents or other family members that provided them with greater opportunities than the poor.

E12 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], one of the main reasons for the rich being richer than the poor is that the rich have been more involved in illegal activities than the poor.

In addition to these questions on the beliefs about causes of inequality, we asked three other questions with the same set of alternatives provided, numerically coded the same way:

E7 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], if the government increases the taxes that the rich have to pay, the rich will work less and invest less.

E13 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], the economic differences between the rich and poor are unfair.

E14 Do you generally agree, disagree, or neither agree nor disagree with this statement: In [Country], the national government should aim to reduce the economic differences between the rich and the poor.

Each respondent were asked two out of E4–E7, drawn randomly. Each respondent were also asked two out of E8–E12. Everyone were asked E13 and E14.

B.5 Other variables

In this subsection we describe the other variables used in the analysis, some that were part of the Gallup World Poll 2018 and some collected from other sources.

Individual level background information was collected as part of the Gallup World Poll 2018. Household income is calculated by Gallup asking first about "monthly [in some countries yearly] household income in local currency before taxes," and they are asked to include all income from wages and salaries in the household, including remittances and other sources. Participants that are unsure are provided a set of income ranges and Gallup imputes a within-range income using hot deck imputation. We normalize to household size using the OECD-standard of a square-root equivalence scale, and construct a rank ordering within each country (scaled such that a rank order of 1 is highest, 0 is the lowest household income). In 2018, income data was not collected in Venezuela. Information on education is collected using the classification: "elementary," "secondary," and "tertiary." We recode to an indicator variable for "high" education, in which the "secondary" group is allocated to the "high" or "low" group such that it maximizes the size of the smallest group. We also use individual data on gender (indicator for male), age (in years), a married indicator, the number of children in household (below age 15),

an immigrant status indicator, and employment status indicator, and a living-in-an-urban-environment indicator. Most individuals answered the background questions in full.

B.6 Cognitive interviews

We conducted cognitive interviews to test for comprehension. The first set of cognitive interviews were conducted between July and November 2017 in Colombia, Ecuador, Egypt, Indonesia, Kenya, Portugal, Zimbabwe, Ukraine, and Ethiopia. Respondents represented a balanced mix of important demographic characteristics including geographic location (urban/rural), gender, age, education and income. The majority of interviews were conducted at the in-country partner's offices or at the respondent's residence. In each country, 12 cognitive interviews were conducted. Each interview lasted about 60 minutes. Representatives from the research team were present in Colombia, Ethiopia, Indonesia, Ukraine, and Zimbabwe.

After the first set of cognitive interviews and subsequent adjustments to the survey instrument, the Gallup team conducted a second set of cognitive interviews with all the new survey questions in Bolivia, Cameroon, Germany, Italy, Kenya, Nigeria, Pakistan, Portugal, Ukraine, and Venezuela in December 2017; again interviewing a balanced mix of respondents. Ten interviews were completed per country in this round.

B.7 Translation, piloting and local adjustments

After the final survey instrument for the Fairness-Across-the-World module was finalized in English, translations were made and tested in the field. First, the English text was translated into the target language, and a test of this version was made on a small sample (on the order of 10–20 persons). A back-translation into English was made by an independent translator. The translation and the back-translation, together with comments on reception in the testing, sometimes about ambiguities in the target language version, were submitted to a team of two Gallup employees and one representative of the research team. Comparing the English source with the back-translated version, sometimes consulting people familiar with the languages and research practices, this process was iterated until the back translations were considered to convey the meaning of the English source version. Interviewers were instructed to follow the interview script without deviations. For some languages that are in use in more than one country, multiple translations into localized versions were made (Arabic, French, and Spanish).

Also for the general Gallup World Poll 2018 questions on background characteristics, some adaptations were made. In Venezuela, it was impossible to collect income data because of hyperinflation.

B.8 Population weighting

The Gallup World Poll 2018 data include population weights to reweigh data to be nationally representative for each country, and indicators for PSUs for countries in which data were collected in clusters (face-to-face interview countries). The Gallup World Poll is based on a probabilistic sample of households (and then sub sampling individuals within the household). The population weights first account for individuals from larger households being less likely to be sampled. Second, the distribution of demographics and socioeconomic characteristics (such as age, gender, urbanicity, and education) in the sample is compared to what is available of official statistics for each country. Post-stratification weights are then constructed with iterative proportional fitting ("raking") that ensures weighted sample statistics replicate official population statistics; as is customary Battaglia et al. (2009), some trimming is applied to the weights to balance the bias vs. variance trade-off.

We apply the population weights for all the analysis of individual data and calculation of national averages. All inference accounts for the clustering at the PSU level. We weight each country equally regardless of its size or the number of respondents in the Gallup World Poll 2018. For the within-country analysis this is accomplished by rescaling the weights for each country such that they sum to the same in each of the 60 countries.

Table B.1: Sample in the Fairness-Across-the-World countries

Country	Languages	Mode	N (WP)	$N(R_1)$	$N(R_2)$	Exceptions
Afghanistan	Dari, Pashto	f2f	1000	1000	1000	Gender-matched sampling was used during the final stage of selection
Algeria	Arabic	f2f	1000	1000	0	Sparsely populated areas in the far South were excluded, representing approximately 10% of the population.
Argentina	Spanish	f2f	1000	962	996	Those living in dispersed rural population areas were excluded. This represents about 5.7% of the population.
Australia	English	phone	1001	0	995	None.
Bangladesh	Bengali	f2f	1000	1000	996	Three hill districts in Chittagong (Rangamati, Khagrachori & Bandarban) and one district in Rangpur (Gaibandha) were excluded for security reasons. The excluded area represents approximately 3% of the population.
Bolivia	Spanish	f2f	1000	968	995	Very remote areas that lack regular public transport were excluded due to difficulty of access. The exclusions represent approximately 11%of the population.
Brazil	Portuguese	f2f	1000	957	993	People living in indigenous lands and dangerous areas where the safety of interviewers was threatened were excluded. The excluded areas represent approximately 1% of the adult population.
Cambodia	Khmer	f2f	1000	958	954	None.

Table B.1: Sample in the Fairness-Across-the-World countries *(cont.)*

Country	Languages	Mode	N (WP)	$N(R_1)$	$N(R_2)$	Exclusions
Cameroon	French, English, Fulfulde	f2f	1000	951	986	The following Arrondissements were excluded due to security concerns from Boko Haram attacks: Goulfey, Blangoua, Fotokol, Zina, Darak, Hile-Alifa, Waza, Bourrha, Mogode, Koza, Mayo Moskota, Mora, Kolofata, and Tokombere. Departement of Manyu, and some localities in the Northwest and Southwest were also excluded due to insecurity. Neighborhoods with less than 50 household were also excluded from the sampling. In total, the geographic exclusions represent approximately 16% of the population.
Canada	English, French	phone	1009	979	1003	None.
Chile	Spanish	f2f	1000	910	996	A few remote and sparsely populated municipalities were excluded due to difficulties of access. The excluded areas represent less than 1% of the population.
China	Chinese	f2f	3649	0	3478	Xinjiang and Tibet were excluded from the sample. The excluded areas represent less than 5% of the population of China
Colombia	Spanish	f2f	1000	946	995	None.
Croatia	Croatian	f2f	1000	966	961	None.
Czechia	Czech	f2f	1000	733	983	None.
Ecuador	Spanish	f2f	1000	966	988	None.

Table B.1: Sample in the Fairness-Across-the-World countries *(cont.)*

Country	Languages	Mode	N (WP)	$N(R_1)$	$N(R_2)$	Exclusions
Egypt	Arabic	f2f	1000	1000	0	Frontier governorates (Matruh, Red Sea, New Valley, North Sinai, and South Sinai) were excluded, as they are remote and represent a small proportion of the population of the country. The excluded areas represent less than 2% of the total population.
Estonia	Estonian, Russian	f2f	1000	933	962	None.
Ethiopia	Amharic, English, Oromo, Tigrinya	f2f	1000	1000	999	Six of the nine zones of the Somali region (Degehabur, Warder, Korahe, Fik, Gode, Afder) were excluded due to accessibility, security issues, and nomadism. Additionally, in the Somali region, Liben Zone, Moyale and Dolo Ado Woreda were excluded because of security concerns. All the wordera in Benshangul region, Kamashi Zone were also excluded for security reasons. The exclusions represents 4% of the population of Ethiopia.
France	French	phone	1000	974	998	None.
Germany	German	phone	1000	966	995	None.
Greece	Greek	f2f	1000	987	991	None.
Hungary	Hungarian	f2f	1000	934	982	None.
India	Assamese, Bengali, Gujarati, Hindi, Kannada, Malayalam, Marathi, Odia, Punjabi, Tamil, Telugu	f2f	3000	3000	2962	Excluded population living in Northeast states and remote islands. The excluded areas represent less than 10% of the population.
Indonesia	Bahasa Indonesia	f2f	1000	998	998	None.
Iran	Farsi	phone	1002	1001	995	None.

Table B.1: Sample in the Fairness-Across-the-World countries *(cont.)*

Country	Languages	Mode	N (WP)	$N(R_1)$	$N(R_2)$	Exclusions
Israel	Hebrew, Russian, Arabic	f2f	1010	1003	986	The sample does not include the area of East Jerusalem. This area included in the sample of Palestinian Territories.
Italy	Italian	phone	1000	989	993	None.
Japan	Japanese	phone	1003	985	976	Landline RDD, excluded 12 municipalities near the nuclear power plant in Fukushima. These areas were designated as not-to-call districts due to the devastation from the 2011 disasters. The exclusion represents less than 1% of the population of Japan.
Jordan	Arabic	f2f	1002	1002	0	None.
Kazakhstan	Russian, Kazakh	f2f	1000	978	974	None.
Kenya	English, Swahili	f2f	1000	992	997	Mandera County, Wajir County, Marsanit County, Baringo County, and Garissa County (except some areas in Garissa and Lagdera districts) were excluded due to accessibility and/or security issues. The exclusions represent 8% of the population.
Malawi	Chichewa, English, Tumbuka	f2f	1000	992	998	None.
Mexico	Spanish	f2f	1034	979	1028	None.
Morocco	Moroccan Arabic	f2f	1001	1001	0	Excludes the Southern provinces. The excluded area represents approximately 3% of the population.
Netherlands	Dutch	phone	1002	994	1002	None.

Table B.1: Sample in the Fairness-Across-the-World countries *(cont.)*

Country	Languages	Mode	N (WP)	$N(R_1)$	$N(R_2)$	Exclusions
Nigeria	English, Hausa, Igbo, Pidgen English, Yoruba	f2f	1000	999	996	The states of Adamawa, Borno and Yobe were under a state of emergency due to Boko Haram activity and were excluded for safety and security reasons. These states represent 7% of the population.
Norway	Norwegian	phone	1000	992	998	None.
Pakistan	Urdu	f2f	1000	998	997	Did not include AJK, Gilgit-Baltistan. The excluded area represents approximately 5% of the population. Gender-matched sampling was used during the final stage of selection.
Peru	Spanish	f2f	1000	962	987	None.
Philippines	Filipino, Iluko, Hiligaynon, Cebuano, Maranao, Waray, Sorsoganon	f2f	1000	1000	996	Some areas were excluded from the sampling frame, due to security concerns (such as barangays considered as war zones in Marawi) and areas that are remote or inaccessible. The excluded population from these areas represent less than 1% of the population.
Portugal	Portuguese	phone	1003	986	997	None.
Russia	Russian	f2f	2000	1852	1921	People living in very remote or difficult to access areas were excluded. The excluded areas represent approximately 5% of the population.
Rwanda	English, Kinyarwanda	f2f	1000	993	997	None.
South Africa	Afrikaans, English, Sotho, Xhosa, Zulu	f2f	1000	950	995	None.
South Korea	Korean	phone	1015	1013	1000	None.
Spain	Spanish	phone	1000	986	996	None.
Sri Lanka	Sinhala, Tamil	f2f	1109	1109	1104	None.
Switzerland	German, French, Italian	phone	1000	980	996	None.

Table B.1: Sample in the Fairness-Across-the-World countries *(cont.)*

Country	Languages	Mode	N (WP)	$N(R_1)$	$N(R_2)$	Exclusions
Tanzania	English, Swahili	f2f	1000	1000	1000	None.
Thailand	Thai	f2f	1000	1000	992	Three provinces in the South region (Pattani, Narathiwat, and Yala) were excluded for security reasons; in addition, a few districts in other provinces were excluded. The excluded areas in total represent less than 4% of the population.
Turkey	Turkish	f2f	1000	930	943	None.
Uganda	Ateso, English, Luganda, Runyankole	f2f	1000	997	1000	Three districts in the North region were excluded for security reasons – Kotido, Moroto Nakapiripirit. The excluded areas represent approximately 4% of the population.
Ukraine	Russian, Ukrainian	f2f	1000	963	952	Due to situation in the East of Ukraine, occupied and conflict areas in Donetsk and Lugansk oblasts were excluded. The excluded areas represent approximately 9% of the population.
United Kingdom	English	phone	1000	977	997	None.
United States	English, Spanish	phone	1004	955	1003	None.
Venezuela	Spanish	f2f	1000	941	996	The Federal Dependencies were excluded due to remoteness and difficulty of access. Exclusions represent less than 1% of the population.
Vietnam	Vietnamese	f2f	1012	924	0	Eleven provinces were excluded: An Giang, Dac Lak, Dien Bien, Gia Lai, Ha Giang, Ha Tinh, Kien Giang, Kon Tum, Nghe An, Quang Binh, Thanh Hoa. The excluded areas represent approximately 19% of the population.
Zambia	Bemba, English, Lozi, Nyanja, Tonga	f2f	1000	992	993	None.

Table B.1: Sample in the Fairness-Across-the-World countries *(cont.)*

Country	Languages	Mode	N (WP)	$N(R_1)$	$N(R_2)$	Exclusions
Zimbabwe	English, Shona, Ndebele	f2f	1000	979	999	None.

Note: For each of the 60 countries in the Fairness-Across-the-World module, the interview languages used are given, the mode of the interview—either phone, both mobile and landline, or face-to-face (reported as "f2f"), the total number of respondents, the total number of respondents who provided responses on their religious affilition (reported in the $N(R_1)$ column), the number that answered 'Yes' or 'No' about whether religion is important in their daily life (reported in the $N(R_2)$ column), and exclusions (if any) that were made from random sampling the whole population of the respective country.

Table B.2: Treatment variation in distribution questions

Treatment	Text to be substituted		Choice alternatives (final distribution)
	A	B	
Luck	it was randomly decided that one of them		(60, 0), (45, 15), (30, 30)
Efficiency	it was randomly decided that one of them	However, there is a cost to transfer money from one person to the other. Only half of the money that is transferred will be received by the one who did not earn anything additional.	(60, 0), (36, 12), (20, 20)
Merit	the one who was most productive on the assignment		(60, 0), (45, 15), (30, 30)

Note: Insert the 'A' or 'B' text at the corresponding places in the comment text to see the three different treatment texts.

II Unleveling the playing field? –Experimental evidence on parents' willingness to give their children an advantage

UNLEVELING THE PLAYING FIELD? –EXPERIMENTAL EVIDENCE ON PARENTS' WILLINGNESS TO GIVE THEIR CHILDREN AN ADVANTAGE

Oda K. S. Sund *

Abstract

Parents make many important decisions that shape the opportunities and outcomes of their children. This paper studies parents' willingness to unlevel the playing field in favor of their child in a competition against another child. In a theoretical model, I show how parents may have different motivations for helping their children in the competition; trading off equal opportunities for all children to increasing their child's chance of succeeding. In a large-scale lab-in-the-field experiment with 1840 parents and their adolescent children, I disentangle the different motivations behind parents' willingness to help their child in the competition. The paper provides three novel findings. First, a significant share of the parents are willing to unlevel the playing field in favor of their own child. Second, the chance of another parent unleveling the playing field causes a large and significant increase in parent's willingness to help their own child. Third, I find evidence consistent with parents having self-serving beliefs. The findings show how parents may have different motivations for interfering in what would otherwise be a meritocratic competition between children; some may help to give their child an advantage; others to keep a leveled playing field.

JEL: C9, C91, C93, D01, D63, I24

Key words: Behavior, Fairness, preferences, inequality, experiment, beliefs, meritocracy, self-serving beliefs, cognitive dissonance

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"They want equal opportunities for everyone else's children, extra for their own"
(Young, 1958, p.22).

Parents want the best for their children, but how far are parents willing to go in order to help them succeed? Are parents willing to undermine meritocratic institutions in society, as suggested by Young (1958) in his path-breaking work on meritocracy?

The meritocratic fairness view is dominant in Western societies (Almås et al., 2021, 2020), but recent work has argued that there is a need for rethinking how we judge success and failure (Sandel, 2020) and particularly the role parents play for the opportunities of children (Bowles et al., 2009; Piketty, 2020; Reeves, 2018). The US college admissions scandal of 2019—where privileged parents cheated the system to get their children into college—provides anecdotal evidence of the lengths some parents are willing to go to benefit their children (Jennifer Medina, 2019). However, we lack systematic evidence on the extent to which parents are willing to give their own child an advantage in what could otherwise be a meritocratic competition, and the mechanisms at play.

The present study provides novel evidence on parents' willingness to unlevel the playing field in favor of their own child in a competition between two children. Taking advantage of a controlled setting, I study two main research questions. First, to what extent are parents willing to forgo the principle of equal opportunities for all children in order to give their own child an advantage in what would otherwise be a meritocratic competition? Second, how are parents' willingness to interfere influenced by other parents' opportunity to unlevel the playing field?

To answer these research questions, I conduct a large-scale lab-in-the-field experiment in collaboration with 24 secondary schools throughout Norway. A total of 921 pairs of 10^{th} grade students and their parents participate in the experiment. Creating a situation where every child initially has an equal opportunity of success, I arrange a mathematics competition where every child compete against another child with the same math ability for a monetary price. Parents are given the opportunity to help their child by making the math problems *easier* for their child, without the child being informed about their decision. By lowering the complexity of the math problems, parents can increase their child's likelihood of winning

the competition. In addition to observing parents' behavior, I also elicit how they expect other parents to behave, as well as data on background characteristics.[1]

Parents are randomly allocated to one out of two treatment conditions; the non-strategic or the strategic. In the non-strategic condition, parents know that their child's competitor will not receive any help. Thus, it is highly salient that helping implies giving their child an advantage. However, in the strategic condition, parents are informed that the other parent is given the same opportunity as themselves to help their own child. Helping may thus be necessary to keep a level playing field.

The paper provides three main findings. First, I find that a substantial share of parents (35.0%) are willing to forgo the principle of equal opportunities by helping their child in the competition even when they know it is at the expense of another child's opportunity to succeed. Second, comparing parents' willingness to help across the two treatment conditions, I find that the chance of another parent ulevel-ing the playing field causes a significant increase in parents' willingness to interfere in the competition. More specifically, knowing that the other parent has the opportunity to help, causes a 73.6% increase in the average amount helped, and a 70.8% increase in the share of parents helping their child in the competition. Third, I find suggestive evidence in line with parents manipulating their expectations about the other parent's behavior in a self-serving manner. While parents know that the other parent is unable to help in the non-strategic condition, the strategic condition lends itself to self-serving belief manipulation. Comparing parents' helping behavior to their stated beliefs about the other parent's helping behavior, I find that only 12% help more than what they expect the other parent to help. The finding is puzzling, as I know from the non-strategic condition that 35% are willing to help when *knowing* the other parent is not helping.

Taken together, I provide evidence suggesting that parents may have different motivations for interfering in what would otherwise be a meritocratic competition between children. Some may help to give their child an advantage, others to keep a level playing field. The findings of the paper are important for understanding how parental background may shape child development and later-life outcomes.

[1] The main analysis of the paper was committed to the Registry for Randomized Controlled Trials operated by the American Economic Association prior to the start of the data collection (AEARCTR-0006609).

Although parents in general may agree with the principle of equal opportunities, they may be willing to undermine the ideal to benefit their child.

The paper speaks to several strands of the literature. The highly influential literature of intergenerational mobility show how family background is important for long-term outcomes and opportunities (Carneiro et al., 2021; Chetty et al., 2014; Corak, 2013), and the normative literature of Roemer (2004) argues that these differences in opportunities and advantages caused by family background are unjust. The present paper builds on this literature and studies an underexplored mechanism for why family background may shape the opportunities of children, namely by intentionally undermining meritocratic processes. The study provides evidence suggesting that parents generally value children having equal opportunities, but also that a relatively large share are willing to give their child an advantage.[2]

Moreover, the study ties into the growing literature aiming to understand parental decision making and interactions between parents and their children (Almås et al., 2016; Brenøe and Epper, 2019; Chowdhury et al., 2020; Dohmen et al., 2012; Houser et al., 2016; Khadjavi and Nicklisch, 2014; Sutter and Untertrifaller, 2020; Sutter et al., 2019; Tungodden, 2018; Zumbuehl et al., 2013), as well as the established theoretical literature on parenting and parenting styles (Becker and Tomes, 1979; Bisin and Verdier, 2001; Cappelen et al., 2020; Doepke and Zilibotti, 2017). Doepke and Zilibotti (2017) argue that the combination of rising economic inequality and the emergence of a winner-takes-all culture has led parents to become increasingly worried about their children being left behind. Wanting the best for their children, Doepke and Zilibotti (2017) provide evidence that parents adopt their parenting styles to the economic environment. This paper points to an important dimension of parenting style not studied in the existing literature, namely parents willingness to unlevel the playing field in favor of their own child. Providing evidence on potential underlying mechanisms, and uncovering a large heterogeneity in parents' willingness to interfere in a competition between children, the paper enriches the existing literature on parenting styles.

[2] A remaining question is whether parents' willingness to help their children in the competition relates to their socioeconomic status. Having received approval to connect the behavioral data with high quality administrative registry data on all participants, I will be able to provide evidence on this based on a pre-registered analysis in the future.

Finally, the study relates to the behavioral literature on cognitive dissonance (Festinger, 1957; Konow, 2000; Rabin, 1994), and self-serving beliefs (Babcock and Loewenstein, 1997; Babcock et al., 1996; Dahl and Ransom, 1999; Di Tella et al., 2015; Haisley and Weber, 2010; Messick and Sentis, 1979; Rabin, 1995), particularly in the context of strategic (Ging-Jehli et al., 2020), and fairness considerations (Haisley and Weber, 2010; Konow, 2000; Rabin, 1995). This literature argues that individuals may subconsciously alter their beliefs in a self-serving manner to accommodate their own interests. The current paper offers novel suggestive evidence on cognitive dissonance and self-serving beliefs of parents with regards to making a choices affecting their children's opportunities of success.

The outline of the paper is as follows. Section 1 outlines the theoretical model used to model parents' helping behavior in the experimental setting. Section 2 describes the design of the study. Section 3 provides the main empirical strategy, and Section 4 reports the empirical results. Finally, section 5 concludes the paper.

1 Theoretical framework

This section outlines the theoretical model. The model aims to explain a parent's choice of whether to help their child in competition, and if so, by how much.[3] The institutional setting in which I investigate parents' helping behavior is the following: two children of an equal performance level compete for a monetary price. Performance is measured by the number of correctly solved math problems. The child that has solved the most math problems correctly, is the winner of a monetary prize. If both solve an equal number of math problems, a winner is randomly drawn.

The parent of each child is allowed to help their child in the competition. The help takes the form of deciding how many of the math problems will be simplified for their child in the competition. Thus the help entails no learning. The help only increases the likelihood of their child succeeding in the competition.

[3]The model is not as sophisticated as to incorporate self-serving belief manipulation/ cognitive dissonance such as the model of Konow (2000).

1.1 General framework

Parents are to make a choice of whether to help their child, and if so, how much help, h, to provide, $h \in [0,H]$. Helping entails no cost to the parent.[4]

I assume the parent to be motivated by i) utility of their child winning the competition, and ii) adhering to a fairness consideration, which is captured by the following utility function:

$$E[u(h_i,h_j,m)] = E[\underbrace{v(h_i-h_j)\times 1}_{Utility\ of\ child\ winning} - \underbrace{\beta_i(h_i-m)^2}_{Disutility\ of\ unfairness}], \quad (1)$$

where h_i is the amount of help provided by the parent, h_j is how much the other parent helps, $v(h_i-h_j)$ is the subjective probability of their child winning as a function of the difference between how much they help and the other parent helps their child, $\beta_i \geq 0$ is the weight individual i assigns to the fairness consideration, and m is what is considered the fair amount of help in this situation. The bonus of the winning child is normalized to 1.

In the model, the level of help provided to the opponent of their child, h_j is an important factor for parent i's decision. The theoretical model can be used to analyze situations both with and without certainty about h_j. In a situation without uncertainty, the parent makes his decision based on h_j, e.g., knowing with certainty that the opponent will not receive any help $h_j = 0$. However, when there is uncertainty about the other parent's helping behavior, parents base their decision on the expected amount helped, $E[h_j]$.[5]

I introduce the following assumptions on the subjective probability of their child winning the competition[6]: $v'(h_i-h_j) \geq 0$ for $s \in [-H,H]$ and $v''(h_i-h_j) >$

[4]This is naturally a simplification. It is reasonable to assume that when parents help their child with school related work, it entails some cost whether it be in terms of time, money or effort. Such cost may of course vary between individuals. However, I choose to abstract from such costs in this setting. Therefore the help in the experiment is free, and the model assumes no such cost. The parent only needs to decide how many math problems should be simplified.

[5]I assume that a parent's utility gained from the child winning the competition is independent of the difference in amount helped. I consider this a reasonable assumption as the child is unaware of his advantage. If this was not the case, one could expect the parent's joy of the child's success being negatively correlated with the amount helped.

[6]It can be shown that such properties could arise from the probability distribution of performance being normally distributed.

0 if $h_i < h_j$, $v''(h_i - h_j) \leq 0$ if $h_i \geq h_j$. Given that the competing students are of the same math ability, students will have equal opportunities of winning the competition given $h_i = h_j$, i.e., $v(0) = \frac{1}{2}$.

Although the parents can increase the likelihood of their child winning the competition by helping their child, they may refrain from doing so. The second term of the utility function is the fairness consideration. Depending on the weight placed on the fairness consideration, β_i, the parent will experience a disutility from deviating from the fairness ideal, m.

Fairness assumption: *The fair amount of help, m, is defined by the amount of help that ensures equal opportunities for both students in the competition, i.e.,* $m = h_j$.

Defining $e = h_i - m = h_i - E[h_j]$, i.e., the deviation between the amount helped and the fair amount, the optimization problem becomes:

$$max\ _{h_i}\ E[u(e)]\ = \int [v(h_i - h_j) - \beta_i (h_i - h_j)^2] f(h_j) dh_j. \tag{2}$$

Assuming the parent maximizes the proposed utility function, the interior solution for the optimal additional help provided by the parent i is:

$$h_i^* = E[h_j] + \frac{E[v'(h_i^* - h_j)]}{2\beta} \tag{3}$$

If the parent focuses solely on the fairness consideration, i will help the amount needed to provide equal opportunities, i.e., the amount matching their expectation about the help provided by the other parent, as $\beta_i \to \infty$, $h \to E[h_j]$.[7]
The model predicts a corner solution of the parent providing the maximum amount of help H if either β goes to 0, as $\frac{\partial v(e)}{\partial h_i} \geq 0$, or if $v'(e)$ is sufficiently high.

He will also provide the maximum amount of help, if $E[h_j] = H$.

In a situation where the parent with certainty knows that the other parent did not provide any help, i.e., $E[h_j] = h_j = 0$, the fair amount of help, m, would equal

[7]The parent need not form a belief about the other child's ability, as they know with certainty that their child is matched with another child based on math ability.

zero. The optimal solution is such a case would equal:

$$h_i^* = \frac{v'(h_i^*)}{2\beta_i} \tag{4}$$

The theoretical model provides the following three predictions:

Prediction I: *A parent will never help less than they believe is needed to provide equal opportunities, i.e.* $h_i^* \geq E[h_j]$.

Prediction II: *A parent's optimal amount of help,* h_i^**, is increasing in the expected help provided by the other parent,* $\frac{\partial h_i^*}{\partial E[h_j]} \geq 0$

Prediction II implies that the optimal choice of help given by parent i in a situation with uncertainty about the other parent's helping behavior, compared to a situation where the parent with certainty knows that the other parent will not help their child, only differs by their expectation about the other parent's helping behavior, $E[h_j]$, as seen by comparing the optimal solutions 4 to 3.[8]

2 Study design

The study combines experimental data from a lab-in-the-field experiment with high-quality administrative registry data for both the parents and the children. This section outlines the study design which the experimental data is obtained. Section 2.1 gives a description of the sample. Section 2.2 explains the recruitment process and section 2.4 provides the design of the experiment, including the implementation of the study.

[8]The same predictions can be drawn from a reduced form model of parents' behavior, e.g., assuming parents are maximizing the following utility function:
$u(h_i, E[h_j])_i = \underbrace{v(h_i - E[h_j])] \times 1}_{Joy\ of\ child\ winning} - \underbrace{\beta_i(h_i - m)^2}_{Fairness}$

2.1 Sample description

The participants in this study are 10^{th} grade students and their parents. The final sample includes 921 sets of parents and children, and is restricted to pairs where both the child and parent participated in the study. Table 1 shows the descriptive characteristics of the participants in the study. Overall, the sample is balanced across treatment conditions ($p = 0.610$).

[Table 1 about here]

62 percent of the sample are mothers. This is due to a combination of more single mothers than single fathers signing up and mothers being more likely than fathers to answer the study.

2.2 Recruitment

The study was conducted in secondary schools throughout Norway during the academic school year of 2020-2021. Participants were recruited through the secondary school of the child. Twenty-four schools participated in the study. Figure 1 is a map showing the location of the schools participating in the study. Students in Grade 10 and their parents were invited to take part in a one hour in-class experiment, and their parents to partake in a short survey.[9] Parents actively had to give consent, both for themselves and the child, as well for allowing the data gathered to be connected to registry data from Statistics Norway (SSB). Parents were incentivized in monetary terms as participation came with the chance of winning one out of seven travel gift cards worth 5000 NOK ($600).

[Figure 1 about here]

2.3 Implementation

The implementation of the study partially follows the procedure of Tungodden (2018). One day prior to their participation in the experiment, parents receive a generic reminder via SMS. The reminder contains no information regarding the

[9] A translated version of the invitation letter is found in Appendix C.1

content of the experiment. The SMS informed the parents that if both parents are signed up to the study, only one will be contacted the next day, and by what time they will have to answer by. For parents who provided contact information on both parents, I randomized whether it is the father or the mother who was contacted.

Figure 2 shows the implementation of the experiment. To limit the opportunity for parents to communicate with their child about the experiment, the parent receives an SMS with an individualized link to the experiment only when the child has left for school. After 12:30, the students took part in the mathematics competition, and the helping choice of the parent was implemented.[10]

For students, the study was implemented online in the class room. Students were given an individual participation code, making it possible to directly connect their study to the study of their parent. The teacher read a script telling the students their rights to withdraw at any time and to not communicate with their classmates during the study.[11]

[Figure 2 about here]

2.4 Experimental design

2.4.1 Parents

Parents are given the opportunity to help their child in the competition. They are first presented with settings of the competition and that in the case of a tie, a winner will be randomly drawn. They are informed that their child will compete for the prize of 50 NOK against another student of an equal performance level in the trial round.

The experiment has a between-subject design. Parents are randomized into one of two conditions: i) strategic or ii) non-strategic. Dependent on the condition, the parent is informed that the parent of the opponent of their child will be given the opportunity to help (strategic) or will not be able to help their child (non-strategic). In the non-strategic, parents thus know that their child's opponent will not receive any help, and as the opponent is of an equal ability, any help they provide will give

[10] A more detailed timeline is shown in Figure 9 in Appendix A

[11] A full translation of the script read by the teacher can be found in Appendix C.5.

their child a relative advantage. In the strategic condition, parents do not know how much help their child's opponent will receive, and thus beliefs are (at least weakly) manipulated upwards.

Having been presented with the situation, the parent is informed that they can help their child in the competition. The help takes the form of having the experimenter simplifying the math problems. They are given a concrete example of a simplification. Instead of five one-digit numbers, the simplified version consists of summations of two one-digit numbers. The parent is free to choose 0–10 questions to be simplified. Parents are assured that neither teachers, students nor other parents will be informed about the decision they make.

Having made their decision, parents are asked to answer some incentivized and non-incentivized questions. First, parents are asked to evaluate how difficult it was to make their helping decision on a scale from very difficult (0) to very easy (10). I then implemented an incentivized elicitation of the following beliefs: i) how effective the help is, ii) the percentage of parents who helped their child in the competition, and iii) how much the parents who helped, helped on average, as well as their beliefs regarding their child's enjoyment of iv) competing, v) working under pressure, and vi) losing.[12] For parents in the strategic condition beliefs regarding how much they believe the parent of their child's competitor helped is also elicited. By answering correctly, parents earn two additional lottery tickets per correct answer. 5 lottery tickets are randomly drawn earning the winners a gift card worth 5000 NOK ($ 600) each.

2.4.2 Students

Students first answer a questionnaire about study habits and time use. To enable eliciting parents' beliefs in an incentivized manner, students are asked about their preferences for competition and working under pressure, as well as how much they disliked losing.[13]

[12] Parents are first asked about their expectation about the average parent's helping behavior in their own treatment condition. Only later are they presented with the conditions under which the parents in the other treatment condition made their helping decision under, and asked about their expectations about the average parent's behavior in that treatment condition.

[13] All translated instructions of the experiment can be found in Appendix C.

To be used as a trial round, students are asked to solve as many math questions as possible within two minutes. Before the time starts, students are shown an example of the math questions; summations of five one-digit numbers as in Niederle and Vesterlund (2007). To avoid any strategic behavior, students are unaware that the challenge will be used as a trial round. Only after having completed the trial round, students are informed about the competition, the bonus and how it is determined. They are told that the competition will consist of similar math problems, and that they would compete against another student having solved as many math problems as themselves in the trial round. Entering the competition, the helping choice of the parent was implemented without the child's awareness.

2.5 Registry data

Though connecting the experimental data to registry data, I gain access to additional information about the participants. The registry data is collected from Statistics Norway (SSB), and the participants actively gave consent for us to get access. The data contained information about the student's school achievements (national tests from 9^{th} grade, final grades from the 10^{th} grade and upper secondary school), choice of educational program at upper high school, as well as the parent's income, occupation and education. A full list of the registry data collected is found in Appendix D.

3 Main empirical strategy

This section outlines the empirical strategy of the main analysis. The empirical strategy of the main study was specified and committed to the AEA RCT Registry (registry number AEARCTR-0006609) prior to any data collection.

The main variable of interest is the parent's helping decision; both measured as the amount of help provided $h_i \in [0, 10]$, and at the extensive margin, $e_i \in [0, 1]$, taking the value 1 if parent i chose to help their child and 0 if no help was provided.

The main regression analysis uses Ordinary Least Square with robust standard errors. To investigating the treatment effect on parents' helping behavior the following regression model specification is used:

$$h_i = \beta_0 + \beta_1 T_i + \beta_2 \mathbf{X_i} + \varepsilon_i \tag{5}$$

where h_i is parent i's helping decision (0–10), T_i is an indicator of the treatment condition taking the value one if the parent was randomized to the strategic condition, and $\mathbf{X_i}$ is a vector of individual pre-specified control variables including the age, gender, income, education and immigration status of the parent, and ε_i is the error term. The main parameter of interest is β_1 representing the estimated average treatment effect of being in a strategic environment instead of a non-strategic environment on the parent's helping decision. As preregistered, results are reported both with and without the control variables included in $\mathbf{X}_i$, and model specification (5) is also reported for the extensive margin (0-1).

To test whether the treatment effect is robust across subgroups, I run the following regression model:

$$h_i = \beta_0 + \beta_1 T_i + \beta_2 S_i + \beta_3 S_i \times T_i \beta_4 \mathbf{X_i} + \varepsilon_i \tag{6}$$

where the variables are as defined for for equation (5), and S_i is an indicator of the relevant sub-group for which the heterogeneity analysis is conducted. The subgroups include: gender of the parent, gender of the student, political orientation of the parent, and math ability of the child.

The second part of the empirical analysis focuses on how parents' helping behavior relates to their beliefs about the other parents' behavior. Parents in the strategic treatment condition are asked about both the other parent's behavior (meaning the parent of their child's opponent) as well as the average parent's behavior. Both belief measures takes values between 0-10, where the belief about the average parent is rounded up to the closes integer. The belief measure of the average parent's behavior combines a parent's beliefs regarding how many out of a hundred parents helped their child *ex*) and how much they think parents who helped, helped on average (*in*). The measures are combined in the following way to obtain a measure of the average parent's helping behavior:

$$b_i = \frac{ex_i}{100} \times in_i. \tag{7}$$

4 Results

This section reports the empirical findings of the paper. Section 4.1 focuses on parents' willingness to help their child in the competition and how this is affected by the possibility of the other parent's opportunity to help their own child. Section 4.2 looks at how parents' helping behavior relates to their beliefs about the other parent's behavior.

4.1 Parents' helping behavior

4.1.1 Providing their child an advantage

Panel A of Figure 3 shows the distribution of the helping decisions implemented by the parents in the non-strategic treatment condition. As parents in this condition are informed that the other parent is not given the opportunity to help, they know that helping their child gives their child an *advantage* in the competition. As displayed by the figure, there is substantial heterogeneity in parent's willingness to give their child an advantage. Sixty-five percent of parents refrain from helping their child in the competition —keeping a level playing field. On the other end of the spectrum we have 7.2 percent of parents, giving their child the largest advantage possible. In-between the two extremes we find approximately 25 percent of the parents helping with half the questions being a local focal point. In sum, refraining from helping, helping with half or all ten questions seems to be the most common choices.

[Figure 3 about here]

4.1.2 Treatment analysis: Non-strategic versus strategic choice environment

Panel B of Figure 3 shows the distribution of parents' helping behavior in the strategic condition. Comparing it to the distribution in the non-strategic condition shown in panel A, it is apparent that helping behavior in both conditions follows the same pattern; providing no help being the most common action, thereafter helping with half, and thereafter the maximum amount of help. However, when both parents are given the opportunity to help their child in the competition, significantly fewer parents refrain from helping and the distribution has a clear rightward shift.

Figure 4 shows the treatment difference in parents' helping behavior between the strategic and non-strategic treatment condition. Panel A shows the effect on the extensive margin, i.e., the share of parents helping their child in the competition. We observe the share of parents helping their child increasing substantially; from 35.15 percent in the non-strategic condition to 61.6 percent in the strategic condition. Panel B of Figure 4 shows the treatment effect on the average amount helped. Whereas parents on average help with 2.0 math questions when they know the other parent is not given the opportunity to help, they help with 3.3 math questions on average if both parents are given the same opportunity to help their child. Hence, the average amount helped increases by 65 percent when the other parent also is given the opportunity to help.

[Figure 4 about here]

Table 2 presents the corresponding regression analysis of the treatment effect on parents' helping behavior. Columns 1–4 report regression estimates of the treatment effect on the extensive margin, while columns 5–8 reports estimates for the same effect on the average amount helped. We observe that the treatment effect is sizable and statistically significant ($p < 0.001$) on both margins. In columns 2–4 and 6–8, we observe that the estimated causal effects on parents' helping behavior remain largely unaffected by the inclusion of the background characteristics of the parent (columns (2) and (6)), characteristics of the child (columns (3) and (7)), and finally to the inclusion of both sets of background characteristics (columns (4) and (8)). Taken together, this provides the basis for the first main result of the paper:

Result I: *A large share of parents (35 percent) are willing unlevel the playing field by giving their child an advantage. The possibility that the other child may also receive help from their parent causes a significant increase in both the share of parents that help their children and the average amount helped.*

[Table 2 about here]

4.1.3 Heterogeneity analysis

This section provides a more detailed study of parental helping behavior by subgroups. From Table 2 we observe that parents' helping behavior is strongly positively correlated with believing that helping their child increases the likelihood of winning the competition ($p < 0.001$), and having a child with below median math performance ($p < 0.001$). Although parents know that all children compete against a child with an equal performance level in the math task, parents whose child performs below average in mathematics is roughly 19 percentage points more likely to help their child in the competition, and with about 1.3 more math questions on average, compared to parents of children with an above or median performance in mathematics. One potential reason for this would be parents placing a higher value on helping their child succeed in subjects they usually struggle with. Finally, we observe that parents' helping behavior is strongly negatively associated with believing it is important for children to learn how to handle defeat ($p < 0.001$). Parents holding this belief may get less disutility from their child losing the competition, as they believe their children may benefit from the experience.

Figure 5 shows the differences in treatment effect on the extensive margin (panel A) and average amount helped (panel B) between subgroups. As shown by the figure, the treatment causes all subgroups to increase their willingness to help their child in the competition on both margins. Table 3 reports the estimated treatment effects by subgroups based on Equation 6, and reports estimates on the extensive margin (columns 1–4) and average amount helped (columns 5–8), separately. The most telling feature of this analysis is the consistency of the estimated treatment effects: for all sub-groups estimates of the treatment effect are positive and statistically significant. What further confirms the robustness of the treatment effects is that the results are based on estimations including a rich set of individual controls.

The fact that patterns in helping behavior are similar across subgroups is also reflected in all interactions between the treatment and the background characteristics being statistically insignificant, with the exception of the interaction with the gender of the parent. Although the treatment causes both fathers and mothers to increase their helping behavior, it causes mothers to increase their average amount

helped with 1.34 more math questions, compared to fathers ($p < 0.001$). The treatment also leads to a large increase on the extensive margin for mothers compared to fathers, however the difference is not statistically significant ($p > 0.1$).[14]

[Figure 5 about here]

[Table 3 about here]

4.2 Behavior and beliefs

This section focuses on the relationship between parents' behavior and their expectations about other parents' behavior. The theoretical model predicts that no parent will help their child less than what is required to ensure equal opportunities for their child in the competition (prediction 1), i.e., one should expect parents to help weakly more than what they expect the other parent to help.

4.2.1 The relationship between behavior and beliefs in the strategic condition

Having decided how much to help their child in the competition, parents in the strategic condition are asked how much help (0–10) they think their child's competitor will receive from their parent. Figure 6 shows the relationship between a parent's helping behavior and their expectation about the helping behavior of the other parent. As observed by the estimated linear relationship, the degree to which parents chose to help their child is strongly and positively associated with their expectation of the other parent's helping behavior ($\rho = 0.63$).

Although there is a strong and positive relationship between parents' behavior and their expectation about the other parent's behavior, parents in the strategic treatment condition on average tend to help significantly *less* than what they expect is required to ensure a level playing field.[15]

[14] As seen from Figure 11 in Appendix B, fathers and mothers both help with approximately two math questions on average in the non-strategic condition; which would suggests that they do not differ with respect to their willingness to give their child an advantage.

[15] The results of a Wilcoxon Signed Rank test show how there is a significant difference in parents' behavior and their expectation about the other parent ($Z = -7.24, p = 0.000$)

As seen in Figure 6, some parents help more than they expect is required to ensure equal opportunities in the strategic condition, but the share is much lower than what one should expect given the behavior in the non-strategic condition. In the non-strategic condition, 34.3 of the parents know that they give their child an advantage, while in the strategic condition only 11.3 percent of parents help more than they expect the other parent to help. The discrepancy may partially be explained by a ceiling effect; namely that parents who expect the other parent to help to the maximum amount are unable to give their child an advantage. However, even assuming that all parents who themselves help and expect the other parent to help with the maximum amount, would ideally like to give their child an advantage, we only have 21.1 percent of parents giving their child an (expected) advantage in the strategic condition.

We further observe that 45.9 percent of the parents display behavior consistent with aiming at ensuring equal opportunities: they implement the same amount of help as they expect of the other parent. Finally, a sizable share of parents (42.6 percent) help less than what they expect the other parent to help; seemingly leaving their child at an expected disadvantage. 22.0 percent of parents even refrain from helping their child in the competition although they believe the other parent will help.

[Figure 6 about here]

Result II: *Parents' helping behavior is highly correlated with how they expect the other parent to behave, but on average, parents help less than what is needed to ensure a level playing field in the strategic condition.*

4.2.2 Self-serving beliefs

In the strategic condition, we observe parents' behavior deviating from the predictions made by the theoretical model. A potential explanation for this may be that parents adjust their expectations about the other parent's behavior in a self-serving manner (Di Tella et al., 2015; Rabin, 1995). While parents know for sure that the other parent is not helping in the non-strategic condition, the strategic condition lends itself to self-serving belief manipulation.

Parents in the strategic condition are asked to state both their expectation about the other parent's behavior *and* the average parent's behavior (0–10). To study whether parents may distort their beliefs in the strategic condition, I compare the two expectations. Given the assumption that the expected beliefs about other parents' behavior are independent of their own child's math ability, it follows that parents on average should have the same expected beliefs about the other parent's and the average parent's helping behavior.[16] This assumption cannot be rejected in my sample as regression results suggest no statistically significant relationships between having a child with a below median math performance and parents' expectations about the other parent ($p = 0.606$) or about the the average parent ($p = 0.239$).[17]

Figure 7 compares parents' expectations of the other parent's behavior to their expectations about the average parent. From panel A, we observe that parents on average expect the other parent to help *more* than the average parent ($p < 0.001$); they on average expect the other parent to help with 4.6 questions and the average parent to help with only 3.2 math questions. Panel B shows the distributions of the

[16]Let parents be characterized by the math ability of their child, $p \in \mathbb{R}$. As parents helping behavior is studied in an environment where their child is competing against another child with an equal math ability, the other parent is characterized by the same math ability. A parent's belief about the behavior of the other parent, given math ability $p = x$:

$$E^{p=x}(h_j|p = x). \tag{8}$$

Given the stated assumptions, the average belief about the helping behavior of the other parent is:

$$\int E^{p}(h_j|p)f(p)dp. \tag{9}$$

A parent's belief about the average helping behavior of the other parent given math ability $p = x$:

$$\int E^{p=x}(h_j|p)f(p)dp. \tag{10}$$

It follows that the average belief about the other parent's behavior is:

$$\int [\int E^{p=x}(h_j||p)f(p)dp]f(x)dx. \tag{11}$$

Given 10 being independent of x, it follows that 11=9.

[17]Further, as shown in Figure 12 in Appendix B there seems to be no difference in the average expectations of parents dependent on their child's math ability; parents with a child with below median math performance have the same average expectation about the other parent and average parent as parents with children of a higher math performance.

two belief variables separately. Parents' expectations about the average parent is more evenly distributed than their expectations about the other parent's behavior ($p < 0.001$); the respective standard deviations being 2.535 and 3.475. Panel B also shows that whilst only a negligible share of parents (1.5 percent) believes that the average parent helped with 10 math questions, 20 percent of parents holds the same belief about the other parent's helping behavior.

[Figure 7 about here]

Figure 8 shows the relationship between the two expectation variables for parents who helped and refrained from helping their child in the competition, separately. As illustrated by the estimated linear relationship, the two expectations are positively correlated for both parents who helped ($\rho = 0.608$) and for those who refrained from helping ($\rho = 568$). The two panels show how although a large share of parents expect the other parent to help more than the average parent for both types of parents, the share is significantly larger for the parents who helped their child in the competition compared to those who refrained from helping. In fact, 70.5 percent of parents who help their children believe that the the other parent will help more than the average parent, compared to only 39.6 percent of the parents who do not help their child.

[Figure 8 about here]

Having made their helping decision, parents are asked to evaluate how difficult they found making the decision. Assuming, as in the theoretical model, that a parent cares about helping their child succeed in the competition and adhering to the fairness ideal of equal opportunities, the conflicting desires can create a dissonance, i.e., form of disutility or tension. In the present framework, a parent may reduce the cognitive dissonance in the strategic condition by either assigning absolute priority to the fairness consideration, adjusting their beliefs about the other parent's behavior in a self-serving manner, or a combination of the two. Adjusting their belief about the other parent upwards, i.e., believing that the other child is helped more, allows the parent to help more without creating a tension with fairness considerations. Based on the theory of cognitive dissonance (Festinger, 1957;

Konow, 2000), one should thus expect a positive association between having a difficult time making the helping decision and distorting their beliefs in a self serving manner, as manipulating their beliefs about the other parent's behavior can help resolve the dissonance.

Table 4 reports the regression results estimating the extent to which parents have distorted their beliefs in a self-serving manner (proxied by expecting the other parent to help more than the average parent) on how difficult they found the decision. As observed from the first row of the table, there is a positive association between finding it difficult to make the decision and expecting the other parent helped more than the average parent ($p < 0.001$). The finding, although correlational, is in line with what the theory of cognitive dissonance would suggest. Column (2) shows that the result is robust to including a rich set of individual controls, none of which seem to be important for explaining adjusting one's expectations about the other parent's helping behavior in a seemingly self-serving manner.[18]

[Table 4 about here]

Result III: *I find suggestive evidence of parents in the strategic condition manipulating their beliefs about the other parent's behavior in a self-serving manner: parents who help their child are more likely to believe the other parent helped more than the average parent, compared to parents who refrained from helping.*

5 Concluding remarks

This paper studies parents' willingness to interfere in a mathematics competition between children. Through making the math problems easier for their children, parents can increase their child's likelihood of success. Manipulating whether parents have to take the helping behavior of other parents into account, I causally

[18] Figure 13 in Appendix B shows the average evaluations of the difficulty making the decision of how much to help their child in the competition by treatment condition and conditional on whether or not the parent chose to help their child. It shows how parents who chose to help their child tend to find it approximately twice as difficult to make the decision compared to parents who refrained from helping their child in the competition.

identify that the expected helping behavior of other parents is an important reason for why parents may themselves choose to help their children in the competition. Although a relatively large share (35 percent) chooses to give their child an advantage—helping even though they are the only parent allowed to help—it seems parents generally value children having equal opportunities. Finally, the study also shows how parents may not always be aware that they help their children to give their child an advantage, as I find evidence suggesting that parents manipulate their expectations of the other parent's helping behavior in a self-serving manner.

Overall, the study shows how parents can play an active role in creating unequal opportunities between children, and as a result undermine meritocratic processes. When designing policy interventions aimed at creating equal opportunities for children, it is thus important to factor in the role of parents. Finding that some parents actively undermine equal opportunities, the study also highlights that there can be a tradeoff between the freedom of parents to help their children as they see fit and creating equal opportunities for all children.

The study opens up several new potential research avenues. The present experiment holds economic incentives and the form of help constant. Manipulating the stakes associated with winning would enable to test the theoretical prediction of the model of increased stakes leading to an increase in parents' willingness to help their child in the competition. In the setting of my experiment, helping does not contribute to increased learning for the child. Are parents more willing to help if it is an efficient way of promoting learning? Another interesting research avenue would be to explore how the willingness to help varies across cultures.

Starting the paper with a quote from Young (1958)–a sociologist who painted meritocracy as a dystopia—I will end with the words of a man reflecting on his role as a parent in a meritocratic society:"To be a parent is to be compromised. You pledge allegiance to justice for all, you swear that private attachments can rhyme with the public good, but when the choice comes down to your child or an abstraction—even the well-being of children you don't know—you'll betray your principles to the fierce unfairness of love. Then life takes revenge on the conceit that your child's fate lies in your hands at all." (Packer, 2019, para.1). More research is needed to understand how and why parents make comprises between the interests of their own children and others.

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A Figures and tables

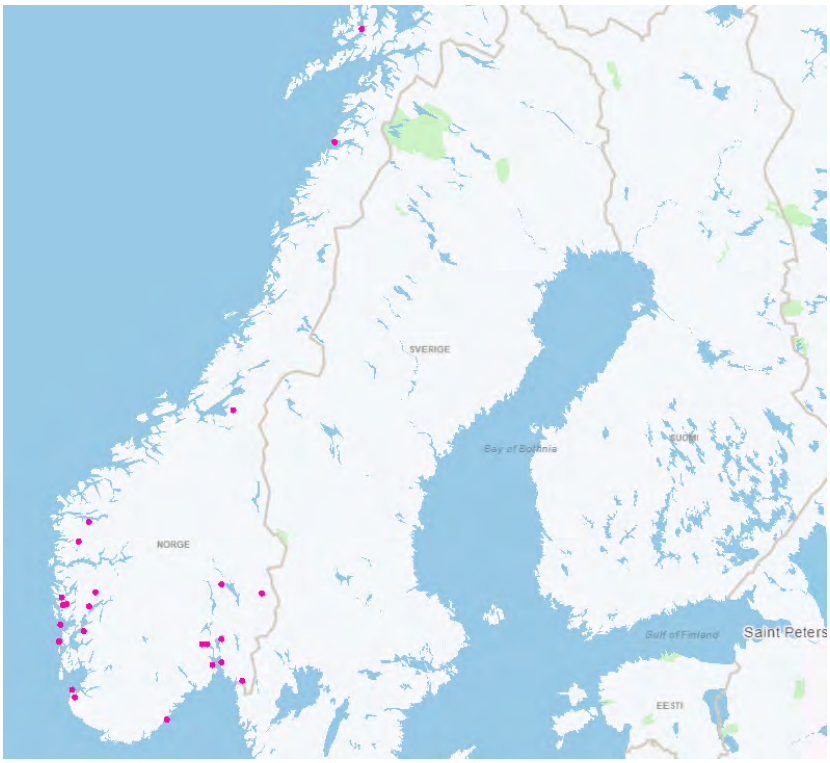


Figure 1: Map with locations of the 24 schools participating in the study

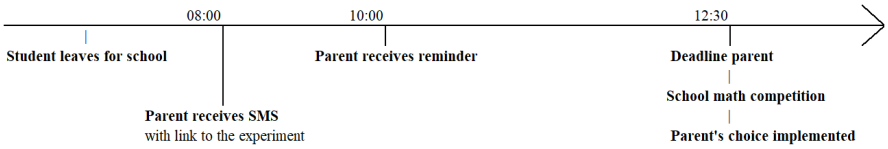
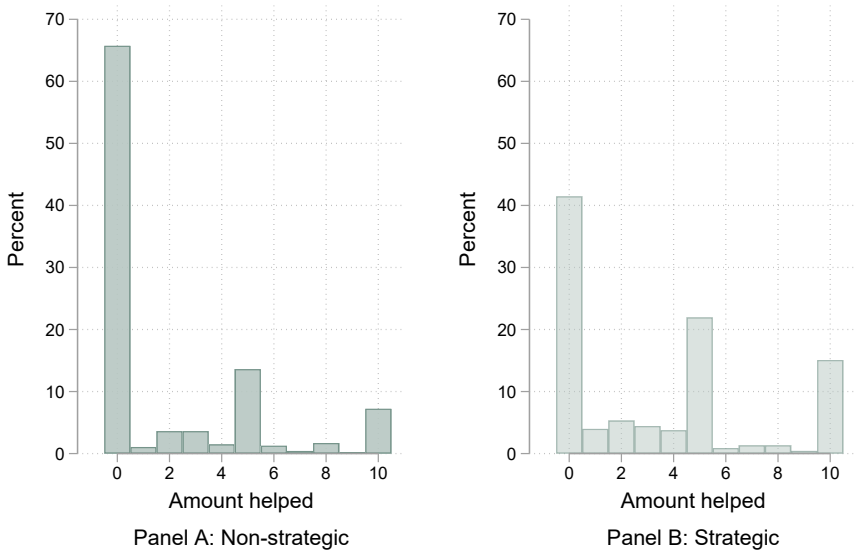


Figure 2: Time line of the implementation of the experiment

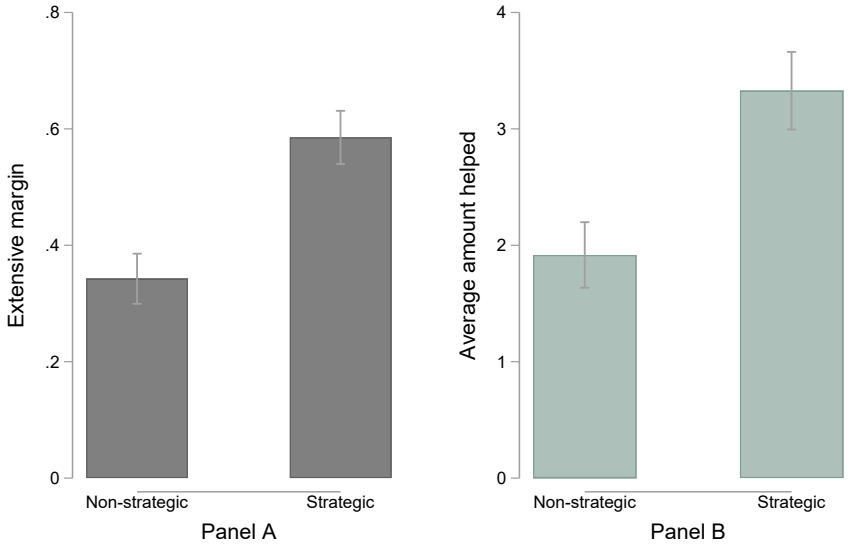
Note: Figure 2 shows the timeline for the implementation of the experiment. Schools participated on different dates, but the data collection was implemented following the outlined timeline.

Figure 3: Distribution of behavior in the non-strategic and strategic treatment condition shown separately



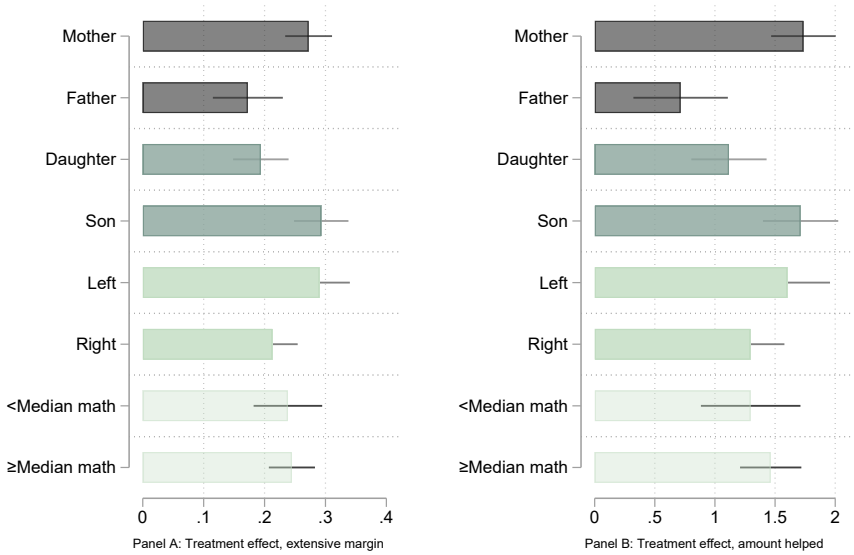
Note: The figure shows the distributions of the amount help parents gave to their child in the competition, 0–10 simplifications. Panel A shows the distribution of parents' helping behavior in the non-strategic condition and Panel B shows the distribution of parents' helping behavior in the strategic treatment condition.

Figure 4: Treatment differences in parents' helping behavior



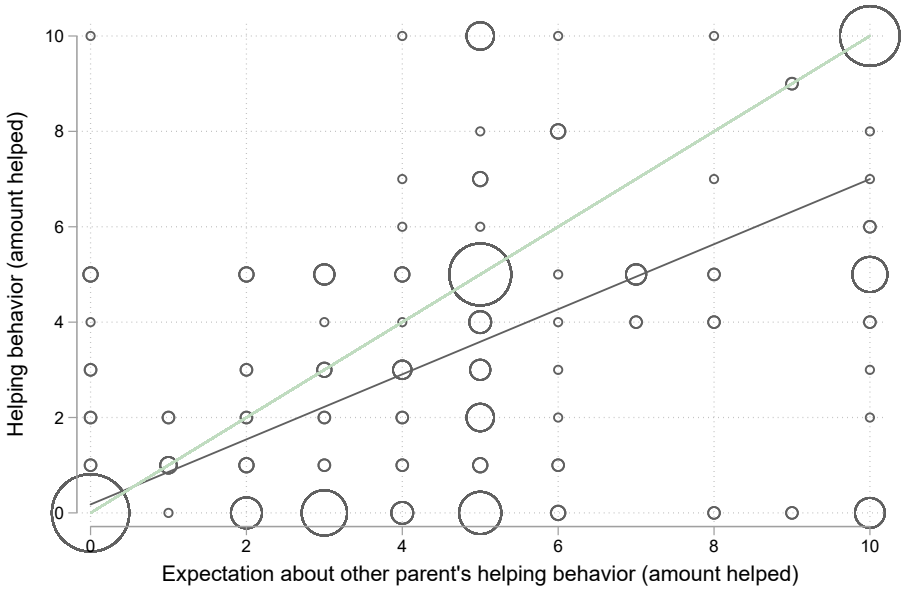
Notes: Panel A shows the treatment differences in the extensive margin, i.e., the share of parents who decided to help their child in the competition. Panel B shows the treatment differences regarding the amount helped (not helping included). Error bar marks 95% confidence intervals.

Figure 5: Heterogeneity analysis of the treatment effect by subgroups



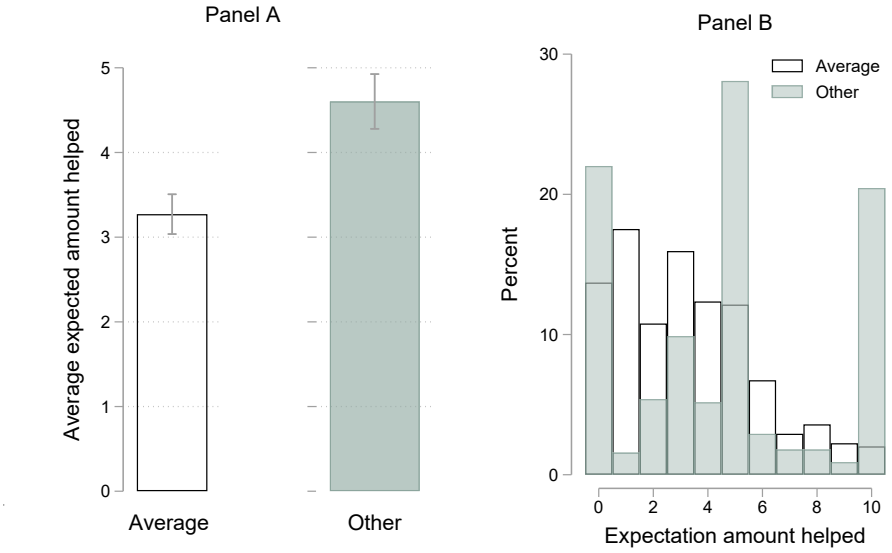
Notes: Panel A shows the treatment effect on the extensive margin across the relevant sub-groups. Panel B shows the treatment effect on the amount of helped (including helping nothing), across the same sub-groups. The sub groups are: *Mothers* (parents who are mothers), *Fathers* (parents who are fathers), *Daughter* (parents making the decision for one's daughter), *Son* (parents making the decision for one's son), *Left* (parents belonging to the left on the political spectrum), *Right* (parents belonging to the right on the political spectrum), *Below median math* (parents who's children perform below average in maths), *Above or median math* (parents who's children perform above or average in maths). Error bar marks 95% confidence intervals.

Figure 6: The relationship between a parent's behavior and the expectation about the parent of their child's opponent's behavior, in the strategic condition



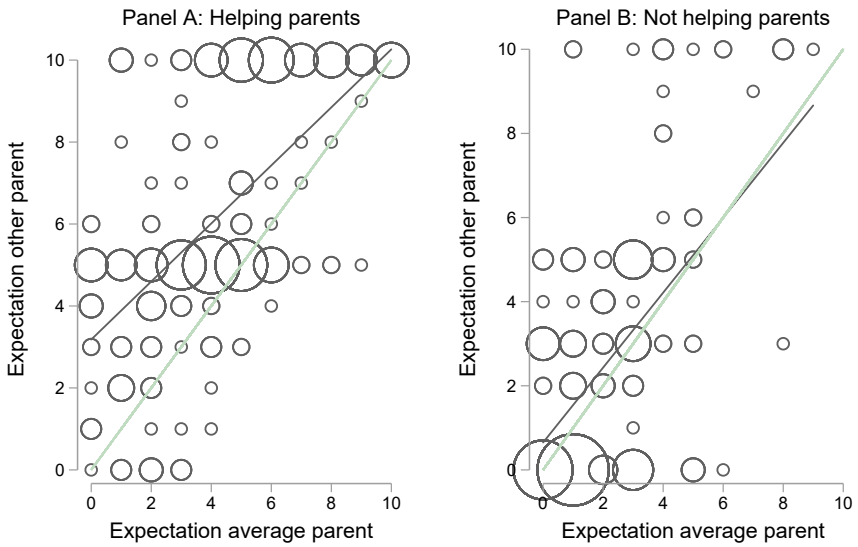
Notes: The figure shows the relationship between the amount helped and their expectations about the amount helped by the parent of the opponent of their child, in the strategic treatment condition. The black line shows the estimated linear relationship between these two variables. The green line represents the 45° line. Size of the circle reflects the frequency of the observed combination of the behavior and expectation.

Figure 7: Distributions of the beliefs about the other parent's and the average parent's helping behavior.



Note: Panel A shows the average belief about the average parent and the other parent's helping decision, separately. Error bars show the 95% confidence intervals. Panel B shows the distributions of the same two belief variables, i.e., the expectations of the helping behavior of the average parent, and the other parent.

Figure 8: Relationship between the beliefs about the other parent's and average parent's helping behavior estimated for parents who helped and did not help, separately



Note: Panel A and panel B the relationship between individuals' belief about the other parent and the average parent's helping behavior. The green line marks the 45° line and the black line the estimated linear relationship between the two. The size of a circle represents the prevalence of the particular combination. Panel A shows the relationship for parents who helped their child in the competition, whereas Panel B shows the same relationship but for parents who refrained from helping their child.

Table 1: Descriptive statistics

	Full sample	Non-strategic	Strategic	p-value
Parental background characteristics				
Mother	0.69	0.68	0.69	(0.60)
Left wing	0.40	0.41	0.39	(0.49)
Parental beliefs				
Effective	42.30	43.61	40.94	(0.18)
Belief like compete	0.67	0.65	0.69	(0.25)
Belief like pressure	0.40	0.41	0.39	(0.55)
Belief dislike lose	0.72	0.70	0.74	(0.29)
Handle defeat	0.93	0.93	0.93	(0.85)
Child background characteristics				
Daughter	0.50	0.51	0.50	(0.72)
Below median math grade	0.31	0.31	0.31	(1.00)
Observations	921	470	451	

Note: The table provides descriptive statistics on the parent sample. Columns 1-3 provides the means, and column 4 reports the p-values from a *t*-test. Mother is an indicator, taking the value one if the parent is female. Left wing is an indicator of the parent's political orientation, taking the value one if the parent is above median on a left-wing scale. Effective takes a value between 0-100 and measures how effective the parent believes helping with one additional question is. The other belief variables are indicators taking the value one if the parent thinks the child likes to compete, likes working under pressure, dislikes losing, or thinks it is important for children to learn how to handle defeat. Daughter is an indicator, taking the value one if the child is female. Below median is an indicator taking the value one if the child has a below median grade in mathematics.

Table 2: Regression results of treatment effect on helping behavior

	Extensive margin				Amount helped			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Strategic	0.243***	0.251***	0.243***	0.251***	1.411***	1.486***	1.412***	1.484***
	(0.032)	(0.031)	(0.031)	(0.031)	(0.222)	(0.219)	(0.218)	(0.216)
Parent, characteristics								
Mother		0.058*		0.059*		0.369		0.383*
		(0.034)		(0.034)		(0.233)		(0.232)
Left wing		0.068**		0.055*		0.383*		0.290
		(0.033)		(0.032)		(0.227)		(0.222)
Handle defeat		-0.251***		-0.267***		-1.333***		-1.436***
		(0.061)		(0.060)		(0.443)		(0.443)
Belief like compete		-0.027		-0.020		-0.481*		-0.438
		(0.037)		(0.037)		(0.278)		(0.277)
Belief dislike lose		-0.079**		-0.068*		-0.284		-0.208
		(0.038)		(0.037)		(0.272)		(0.269)
Belief like pressure		-0.055*		-0.023		-0.382		-0.155
		(0.033)		(0.033)		(0.235)		(0.229)
Effective		0.003***		0.003***		0.018***		0.019***
		(0.001)		(0.001)		(0.004)		(0.004)
Child, characteristics								
Daughter			0.019	0.020			0.056	0.013
			(0.031)	(0.031)			(0.218)	(0.216)
Below median math grade			0.187***	0.185***			1.302***	1.279***
			(0.034)	(0.034)			(0.243)	(0.243)
Constant	0.343***	0.487***	0.274***	0.410***	1.917***	2.606***	1.478***	2.130***
	(0.022)	(0.074)	(0.028)	(0.077)	(0.143)	(0.522)	(0.184)	(0.535)
Observations	921	904	921	904	921	904	921	904
R-squared	0.059	0.120	0.090	0.149	0.042	0.099	0.074	0.127

Note: The table reports regression estimates based on equation 5 with robust standard errors reported in parentheses. Column (1)–(4) report regression estimates using the extensive margin as the dependent variable, taking the value 1 if a parent helped their child, and 0 if it refrained from helping. Column (5)–(8) reports regression estimates using the amount helped as the dependent variable. The variable takes values from 0–10, where 10 reflects the parent helping with 10 math questions. The controls are as defined in table 1. Robust standard errors reported in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 3: Heterogeneiety analysis of treatment effect

	Extensive margin				Amount helped			
	Mother	Daughter	Left	<math	Mother	Daughter	Left	<math
Strategic	0.175***	0.279***	0.216***	0.247***	0.706*	1.666***	1.331***	1.520***
	(0.058)	(0.045)	(0.040)	(0.037)	(0.395)	(0.309)	(0.276)	(0.252)
Group	0.006	0.048	0.013	0.179***	-0.158	0.190	0.103	1.335***
	(0.047)	(0.043)	(0.044)	(0.049)	(0.312)	(0.281)	(0.286)	(0.337)
Group × Strategic	0.111	-0.056	0.088	0.012	1.134**	-0.361	0.385	-0.114
	(0.069)	(0.062)	(0.063)	(0.066)	(0.475)	(0.426)	(0.444)	(0.480)
Controls	✓	✓	✓	✓	✓	✓	✓	✓
Treatment effect	0.286 ***	0.223***	0.304***	0.259***	1.840***	1.305***	1.717***	1.406***
(on group)	(0.037)	(0.043)	(0.049)	(0.055)	(0.258)	(0.298)	(0.347)	(0.410)
Observations	904	904	904	904	904	904	904	904
R^2	0.151	0.149	0.150	0.149	0.133	0.128	0.128	0.127

Note: The table report regression estimates based on equation 6. Columns (1)–(4) reports regression estimates for the extensive margin (taking the value 1 if the parent chooses to help her child, and 0 otherwise). Columns (5)–(8) reports the regression estimates using the amount help (0–10) as the dependent variable. Control variables are as defined in table 1, and the same as used in 2. Column headers show the indicator variable that is used to define the Group, where Group takes the value one if the indicator variable in the heading of the respective column takes the value one: *Mother* (the parent being the mother), *Daughter* (the child being female), *Left* (the parent being defined being politically left wing oriented), and $<$ *Math* (the child having a below median grade in mathematics). Robust standard errors reported in parentheses. * $p < .1$, ** $p < .05$, *** $p < .01$

Table 4: Regression results of expecting the other parent to help more than the average parent

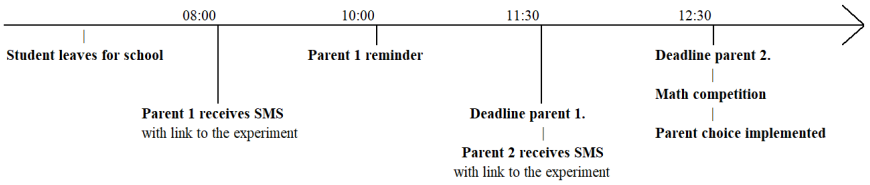
	(1)	(2)
Difficult	0.131***	0.143***
	(0.047)	(0.048)
Parent, characteristics		
Mother		0.067
		(0.053)
Left wing		0.066
		(0.049)
Effective		-0.000
		(0.001)
Belief like compete		-0.000
		(0.057)
Belief like pressure		0.086*
		(0.050)
Belief dislike lose		-0.029
		(0.058)
Handle defeat		0.062
		(0.094)
Child, characteristics		
Daughter		0.005
		(0.047)
Below median math grade		0.025
		(0.051)
Constant	0.500***	0.349***
	(0.037)	(0.116)
Observations	451	442
R-squared	0.017	0.040

Note: The table reports the regression estimates of expecting the other parent to help more than the average parent. The control variable Difficult is a binary variable taking the value one if the parent finds it above median difficult to make the choice of how much to help her child in the competition. The other control variables are the same as reported in Table 2. Robust standard errors reported in parentheses.

* $p < .1$, ** $p < .05$, *** $p < .01$

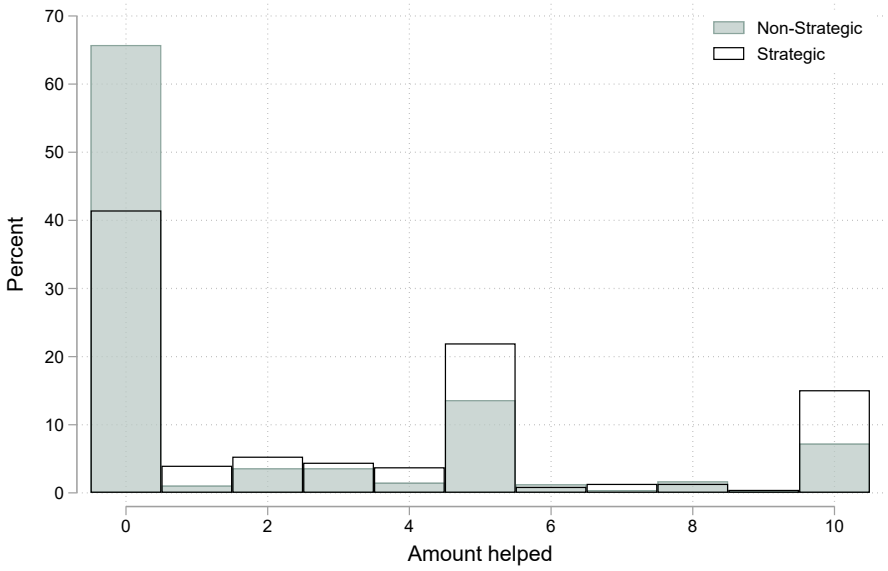
B Complementary analysis to the paper

Figure 9: Detailed time line of the implementation of the experiment



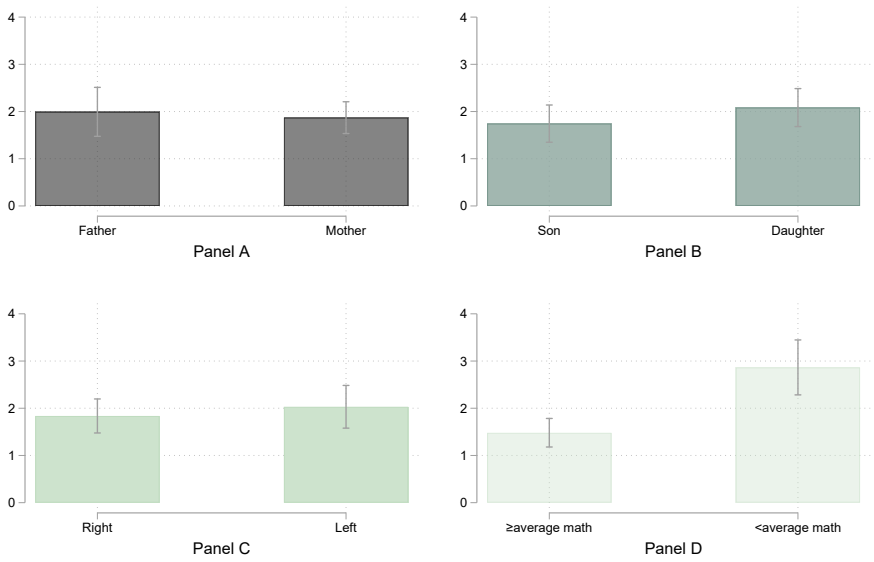
Note: The figure shows the detailed timeline for the implementation of the experiment. Schools participated on different dates, but the data collection was implemented following the outlined timeline.

Figure 10: Distributions of helping behavior shown for each treatment condition separately



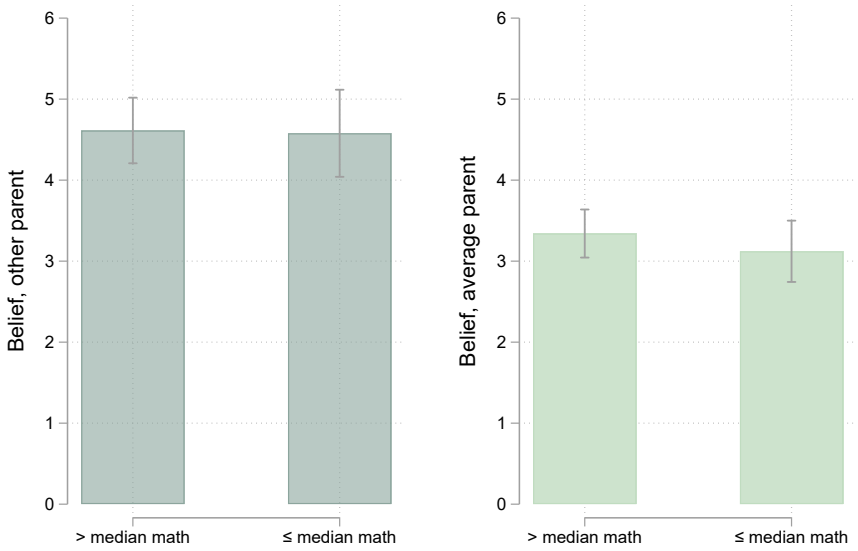
Note: The figure shows the distribution of the amount helped for the Strategic and the Non-strategic treatment condition, separately.

Figure 11: Behavior in the non-strategic condition by subgroups



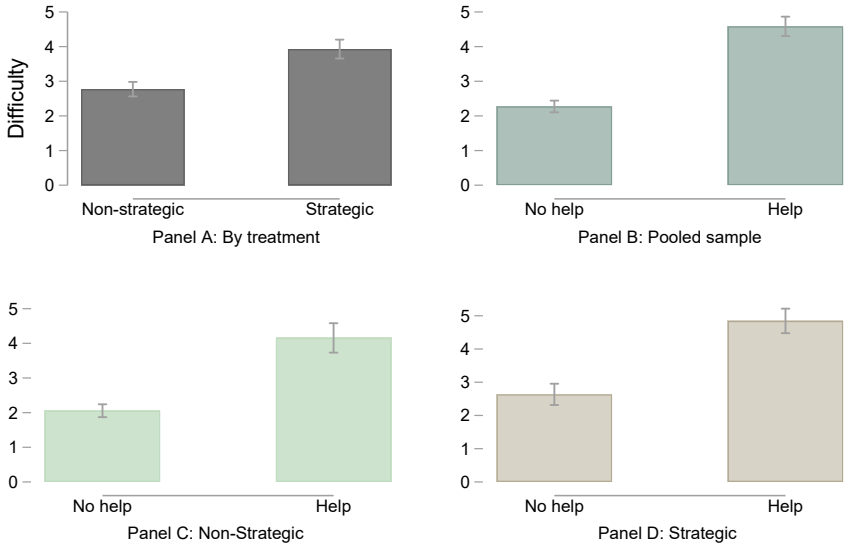
Note: The figure shows the average amount helped for different subgroups in the non-strategic treatment condition. The sub groups are: *Mothers* (parents who are mothers), *Fathers* (parents who are fathers), *Daughter* (parents making the decision for one's daughter), *Son* (parents making the decision for one's son), *Left* (parents belonging to the left on the political spectrum), *Right* (parents belonging to the right on the political spectrum), *Below median math* (parents who's children perform below average in maths), *Above or median math* (parents who's children perform above or average in maths). Error bars marks the 95% confidence intervals.

Figure 12: Beliefs about the other parents' behavior for parents in the strategic treatment, conditioned on child's grade in mathematics



Note: The figure shows the average belief about the amount helped by the other parent (panel A), and the average belief about the amount helped by the average parent (panel B). The figure shows the average beliefs stratified by having a child who performed below median in maths or not. Error bars marks the 95% confidence intervals.

Figure 13: Difficulty of making helping decision



Note: The figure shows the average self-evaluation of how difficult it was to make the decision of how much to help their child in the competition, measured on a scale from very easy(0) to very difficult (10). Panel A shows the average degree of difficulty by treatment condition. Panel B shows the average degree of difficulty by the extensive margin, for the pooled sample. Panel C shows the average degree of difficulty by the extensive margin for the the non-strategic treatment condition only.

C Instructions

C.1 Invitation letter to parents and students

Invitation to participate in "Læring for Livet prosjektet" arranged by the Norwegian School of Economics to students in grade 10 and their parents

The aim of the project is to better understand what affects students' learning at home, in kindergarden, and at school. Participants in the project are children and their parents. Your school wants to participate and all students in grade 10 and their parents are invited to participate.

What does participating entail?

The study will take place at school DATE and will take one school hour (45 minutes). The students will be asked to do some tasks and answer some short questions on their computers. Participation requires no prior knowledge and all participants will receive help if needed. The students will earn smaller monetary amounts that will be paid in the aftermath of the study.

A couple of weeks after the study, a subset of the students will receive a short questionnaire via SMS which will take about three minutes to complete.

Associated with the study, one parent will receive an internet link for a short questionnaire via SMS.

The results of the study will be connected to information from Statistics Norway with regards to the student's school achievements (national tests from $9^{\lfloor th}$ grade, final grades from the 10^{th} grade and upper secondary school), choice of educational program at upper secondary school and parents' income, occupation and education.

Participation is voluntary

Participation in the study is voluntary and not a part of the students' school work. There will be alternative arrangements for students who will not participate. If you want to participate the student and a parent have to use the link below to confirm the participation in the study as soon as possible (and at the latest: DATE)

[Internet link to participation form and a QR-code containing the same link.]

Privacy concerns

The project has been evaluated by the Norwegian Centre for Research Data AS (NSD) that has found the treatment of personal information complies to all privacy regulations. The participants' name, date of birth and contact information will be stored in encrypted form on a research server and only be available to one person in the administration. By the project's end date (the latest December of 2030), this personal information will be deleted.

Your rights

You have the right to gain insight into the personal information gathered about you, get a copy of them, the right to get the information deleted, and send a complaint to the personal information ombudsman or the Data Protection Inspectorate regarding how your personal information is handled.

Where can I get more information?

If you want more information about the research project, or wish to withdraw your consent, you may contact the project coordinator [Name and email address].

If you have questions regarding privacy concerns, you may contact:

- The person in charge of personal information at Norges Handelshøyskole (NHH), email personvernombud@nhh.no
- NSD- Norwegian Centre for Research Data As, at email personverntjenester@nsd.no or by phone: 55 58 21 17.

Throughout the duration of the project you may follow the project on our website

https://www.nhh.no/en/research-centres/fair/research/laering-for-livet/ where we update you with information about the project.

With kind regards

Oda Sund

Project manager

[My contact information]

C.2 Participation Form, Parents and students

Welcome to the participation scheme!

This is the declaration of consent form for participation in the 'Learning for life' study (Læring for livet), for students and parents.

- We have received and understood information about the project Learning for Life, and received information on where to go if we have any questions.
  We agree that the student will participate in the study, which will take a school hour in March / April, and that the project may send a short survey on SMS to the student in April / May
  - Yes/ No

- We agree that the project links the results of the study to information about the student and the parents from Statistics Norway.
  - Yes/ No
- We agree that the project will send a short survey on SMS to one of the parents in connection with the completion of the study.
  - Yes/No
- **We take your privacy seriously:**
  All information you provide in this form will be treated with strict confidence and in accordance with the privacy policy. Data is collected via Qualtrics - a secure solution for data collection. All personal data we collect is stored in encrypted form, separate from other research data. Once the data collection has been completed, data will be transmitted in encrypted form to a secure server at NHH.
  - Next button/ exit survey

- We agree that information about us will be processed until the project is completed in December 2030.
  The full name of the student
  - Text box
- The student's phone number
  - Text box
- The students date of birth
  - Date, month, year
- The name of the school

  - Text box

- School class (If the 10^{th} grade is not organized into classes, please state the name of the student's group, base, etc.)
  - Text box

To the parent completing this form:

- Your role related to the student
  - mother/ father/ other (text box)
- Your full name
  - Text box
- Your date of birth
  - Date, month, year

Items only displayed if the parent answered yes to participating in the study

- Your phone number
  - Text box
- The phone number of the other parent
  - Text box

Thank you so much for responding to the questionnaire!

You can follow 'Learning for Life' on the project website: https://www.nhh.no/en/research-centres/fair/research/laering-for-livet/

C.3 Instructions, adult sample

Welcome!

Thank you for participating! This survey will take approximately five minutes, and is related to the survey your child will participate in at school later today.

We ask you to answer this survey alone, and that you do not talk to your child about this survey (before he/she has finished his/ hers part of the study). This is important for our research.

If you need help with the survey or have any other questions, you may contact the phone number listed on the bottom of every page.

Below is a declaration of consent regarding your participation in the study. Please press the arrow to accept the declaration and start the survey.

Declaration of consent

The participation in this study is voluntary and you can at every moment terminate your participation. If you accept to participate, we ask you to please finish the survey. The survey will be linked to de-identified data from the income- and education register of Statistics Norway. That the data is de-identified means that any personally identifying information has been replaced with a key code that points to a list of personally-identifying information. As with all research, there is a possibility of a breach of your confidentiality, but we take preconditions to minimize this risk. The list of personally-identifying information will be stored on a server with two-factor identification in an encrypted file. No researchers will have access to personally-identifying information, and if the results of the study are published or presented, no personally-identifying information will be provided.

If you have any questions regarding the research project, you can contact us on telephone xxxxxx or email xxxxxx.

As a part of the ”Læring for livet”-study the students participate in a competition. The competition involves solving as many calculations as possible within two minutes.

For example: 5 + 6 + 1 + 9 + 7 = ?

Your child will compete against a student who did equally well in a test round. The children compete for a prize of 50 NOK. The student that loses gets no prize. If

both get the same result, a winner will be randomly drawn.
You have the possibility of helping your child.
The help entails that we simplify some of the calculations your child gets in the competition. As an example we could reduce the previous calculation to 1 + 9 =? .
You can choose how many calculations you want us to simplify for your child (0–10).
Strategic: The parent of the opponent of your child, will also be given the opportunity to help their child in the competition.
Non-strategic: The parent of the opponent of your child, will not be given the opportunity to help their child in the competition.
It will not be possible for your child, other students, teachers or other parents to know which decision you make.
How many math questions do you want to help your child with (0-10)?

We now want to ask you some questions about the decision you just made.

How difficult did you find making the choice of whether or not to help your child to be?
10: very difficult, I might as well have done something different.
1: very easy, I would never have done anything different.

We now want to ask you some questions about what you believe about the choices made by the other parents who are participating in the survey.

You can win a travel gift card if you answer correctly. As a thank you for your participation in the research project, you will receive a lottery ticket. In the lottery, two parents will win a travel gift card to the value of 5000 NOK In addition you will receive two additional lottery tickets for each of the upcoming questions you get right.[19]

[19]**The order of the beliefs questions are different between the strategic and non-strategic. The strategic is first asked to provide beliefs about the strategic condition, and thereafter for the non-strategic. For the non-strategic, it is the other way around. Also, in between these belief questions, there is a page break.**

- How many math questions do you believe the parent of the other child helped their child with?
- Parents with children in the 10th grade are participating in this study. Out of a 100 parents, how many do you think helped their child in the competition given that they, as you, were the only parent allowed to help their child?
- Out of the parents who helped, how many math problems do you think they helped their child with on average?

Also these questions concern which choices you think the other parents who participate in the study have made. **By answering correctly, you can earn additional lottery tickets.**
The parents we now ask you about, have made choices in a different situation than the one you made your choice in.[20]

- Some of the parents participating in this study were asked if they would like to help their child in a situation where the parents of the other child competing against their child were also given the choice of whether or not to help their child.
  Out of a hundred of parents in in this situation, how many do you think have chosen to give their child an advantage?
- Out of the parents who helped, how many math problems do you think they helped their child with on average?
- Of students who received help with **one math question more** compared to the student they competed against, how large a percentage do you think won the competition?

[20]This shows instructions for parents in the non-strategic treatment condition. Parents in the strategic treatment condition are given a description of the non-strategic treatment condition.

We now want to ask you some questions about your child. You can earn additional lottery tickets by answering correctly.

- To what degree do you think your child would agree to the following statements as a description of him/herself?
  - Likes to compete
  - Dislikes losing
  - Likes to work under pressure
- Totally disagrees/ Partially disagrees/ Neither agrees nor disagrees/ Partially agrees/ Totally agrees.

We now wish to ask you some more general questions.

- We now want you to indicate to what degree you agree with the following two statements.
  0 means that you totally disagree with the statement.
  10 means that you totally agree with the statement.
  - The government should aim to reduce inequalities between rich and poor in society
  - It is important for children to learn to handle defeat.
    - Slider moving from 0 to 10.
- We now wish to ask you how you feel about two different concepts.
  0 means that you are totally against
  10 means that you are totally for
  - Privately run high schools
  - Inheritance taxation
    - slider moving from 0 to 10

Thank you for participating in our study!

C.4 Instructions, student sample

We here provide the full instructions (translated from Norwegian).

Introduction

Welcome and thank you for your participation! This is a research project organized by researchers from the Norwegian School of Economics. We are going to ask you some questions related to school and learning environment.

Privacy

All your answers will be handled with strict confidentiality. It will not be possible for teachers, parents or other students to know which answers you provide.

Payment

You earn 50 NOK for participating in this survey. In addition you will, as part of the study itself, get to participate in two different lotteries where it will be possible to earn a limited amount of money. The total payment will be paid in a sealed envelope within one day.

- What is your participation number? Write the participation number you just received. This is important to be able to give you the correct payment.

To what degree do you agree or disagree with the following statement about yourself?

- I like to compete
- I dislike losing
- I like to work under pressure

Totally disagree/Somewhat disagree/Neither agree nor disagree/Somewhat agree/Totally agree

---

How many calculations do you manage to solve in two minutes?

We now ask you to try and solve as many calculations you can in two minutes. The calculations takes the form of: 5 + 6 + 1 + 9 + 1 = ?
You may not use a calculator, but you may use pen and paper if you prefer.
We do not expect you to solve all the math questions. It's all about solving as many as possible, so do the best you can!
When you are ready, please press the button.

How well do you think you performed relative to the other students who also attend 10^{th} grade? [21]
0 = among the the 10% who performed the worst in the test round
50= average
10= among the 10% who performed the best in the test round.

- Slider moving from 0 to 10

It is time for the real competition.
You will be competing solving the same type of math problems. You now have 2 minutes to solve as many math problems as possible.

[21] Only half the students are randomized to being asked this after the test round. All students are asked this question after the competition.

You will be competing against a student with the same score as you in the test round. The winner of the competition is the one who solves the most math problems correctly.
The winner will receive a prize of 50 NOK.
When you are ready to start the competition, please press the arrow button.

You have completed the survey. Thank you for participating! We greatly appreciate your participation!

C.5 Text read aloud by the teacher prior to the students' study

Note to teacher (not read aloud): *We kindly ask you to read the following text aloud after the students have received their participation code, and you are ready to start.*

Now we will take part in a research project directed by the Norwegian School of Economics. I hope you will answer the study with tasks and questions related to your schooling, school environment and group of friends. In addition, the researchers wish to gather information about your performance at school, background information, and your choice of school.

All gathered information as well as all the answers you give will be treated strictly confidentially. It will not be possible for me, other teachers, your parents or students to know what you answer. This is a project to which one of your parents has given their consent for you to partake in.

It is possible to earn a limited amount of money by participating in the study. You will receive the total amount in the aftermath of study.

Your participation is voluntary, and not organized by the school. If you do not wish to partake –now or at a later stage– please let me know.

The results from this study will be used for research. Therefore it is important that you follow some rules. It is not allowed to speak to any of your classmates during the study. If you have any questions or need help, please raise your hand, and I will come to help you.

Are there any questions before we start?

Note to teacher (not read aloud): *When all questions are answered, you can copy the internet link to the study or write it on the blackboard. When all students are logged in, please send me an SMS (PHONE NUMBER) to let me know the total of students participating from your class, and we will start the study.*

C.6 Instructions follow up study, students

We here provide the full instructions to the follow-up survey (translated from Norwegian).

Introduction

A couple of weeks ago, you participated in a research project organized by the Norwegian School of Economics. The project was carried out at your school and we are very grateful for your participation. We are contacting you now because we hope you can answer a short and simple follow-up survey. This follow-up survey is important for the success of the research project. We therefore hope you are able to take the time to answer it. It only takes a couple of minutes. The survey is voluntary, but the answers are important to the research project and we therefore highly appreciate your participation.

Privacy

All your answers will be handled with strict confidentiality. It will not be possible for teachers, parents or other students to know which answers you provide.

Payment

Everyone who participates in the survey from your class gets to participate in a lottery. Everyone gets one ticket for the lottery, and we will draw three prizes of NOK 2000 each when everyone has answered. The winners will receive a message by SMS some time after the survey is carried out such that they can receive their payments.

Contact

If you have any questions to the survey, please contact daily responsible, Ranveig Falch: [e-mail address].

Which school do you attend?

Which class are you in?

Write e.g. 10A if you are in 10A.

What is your participation number (see sms)?

Please write the participation number you received from us by sms. Remember to write it correctly, such that you can receive your prize if you win the lottery.

In connection with the research project, you participated in a competition. Did you and your parents talk about it afterwards?

- Yes/ No/ I do not remember

If yes, what did you talk about?

- Text box

D Registry data

Subsection D.1 and D.2 lists the data gathered from the registry data on the parents and students, respectively. The names of the variables

D.1 Registry data, parent sample

- Pensionable earnings and agreed monthly salary. Annual information, from 2019.[22]

[22] wxx_xxxx_lnr_person, wlonn, pgivinnt

- Occupational and labor market status. Annual information, from 2019.[23]

- Highest completed education. Annual information, from 2019.[24]

D.2 Registry data, student sample

- Gender[25]
- Immigration category[26]
- Results on the national tests from the 9^{th} grade.[27]
- Final grades in secondary school.[28]
- Grades from upper secondary school, school municipality, organization number, form of ownership and course data on highest completed education.[29] [30]

[23](wxx_xxxx_lnr_person, EDAG_PERIODE, ARB_YRKE_ISCO, ARB_AVTALTARBEIDSTID_PUB, ARB_HELDELTID_PUB, ARB_STILLINGSPST_PUB, LONN_IALT, LONN_FMLONN, LONN_FAST_TILLEGG, LONN_UREGTIL, LONN_BONUS, OVERTID_PUB, LONN_OVERTID_TIMER, FRTK_SEKTOR_2014, VIRK_NACE1_SN07)

[24]bu_åååå

[25]kjoenn

[26]Innvkat

[27]AARGANG, ORGNR, ORGNRBED,DELTATTSTATUS, PROVE, OPPGAVESETT, MESTRINGSNIVAA, POENG, SKALAPOENG

[28]ORGNR, SKOLEKOM, FAGKODE, TERMIN1, TERMIN2, STP, SKR, MUN, AVGDATO

[29]The student sample attend the 10^{th} at the time of the study. We will thus only receive information regarding upper secondary school for the students who start in the fall of 2020 and 2021 (as we have committed to NSD (The Norwegian Centre for Research Data) to delete the key containing personal information enabling us to link our experimental data to the registry.

[30]bu_åååå, bu_åååå, kun første siffer nivå, bu_åååå, nivå gruppert, igang_åååå, REGDATO, KODE, TILGDATO, AVGDATO, TOMDATO, REGTOM, KOMMNR, KOMMNRDATO, BU, BUDATO, BU_KLTRINN, BU_KLTRINNDATO, BU_REGDATO, BU_LOEPENR_kURS, REGDATO, KODE, TILGDATO, AVGDATO, TOMDATO, GYLDIG_TV_FOM, REGTOM, NUS2000, KLTRINN2000, KLTRINN2000DATO, UTFALL, GRUNNSKOLEPOENG, KOMP, KOMPDATO, SKOLEKOM, ORGN, EIERF, SKOLEAR, ORGNR, VIDEREGAENDEPOENG, FAGKODE, MUN, SKR, STP, TERMIN1, TERMIN2, KAR_ANNEN, FAGSTATUS

III Confident winners of a meritocratic world

Confident winners in a meritocratic world

Kajsa Hansson Oda K. S. Sund *

Abstract

How does the experience of success in combination with confidence affect meritocratic beliefs and preferences for redistribution? In a large-scale experiential study, we manipulate both the level of confidence in own performance and the outcome of a competition to provide causal evidence. First, we document that increased confidence has a polarizing effect on meritocratic beliefs: Whereas we find no difference in beliefs between winners and losers in a low-confidence treatment, increasing the level of confidence causes winners to believe that the competition is more likely to be determined by merit compared to losers. We further find that winning the competition significantly decreases the willingness to redistribute, regardless of confidence treatment. Our findings suggest that disagreements about the causes of inequality are most likely to occur among people who expect to succeed, but also that the disparities in beliefs have limited impacts for their preferences for allocation of earnings.

JEL: C91, D63, D83, D91

Key words: inequality; fairness; redistribution; merit; luck; success; experiment

*Hansson: Linköping University, Sund: NHH Norwegian School of Economics. The experiments reported in this paper were conducted by the JEDI Lab at Linköping University and The Choice Lab at the Centre for Experimental Research on Fairness, Inequality and Rationality (FAIR) at NHH Norwegian School of Economics. We are grateful for financial support for this project from The Swedish Research Council and The Lars Hierta Memorial Foundation.

How we form our beliefs about how meritocratic the world is, i.e., to what degree success can be attributed to factors within our control, is important because these beliefs have been shown to affect preferences for redistribution (Almås et al., 2020; Cappelen et al., 2007; Fong, 2001), and can help explain variations in redistributive policies and income inequality across countries (Alesina and Angeletos, 2005; Alesina et al., 2005). Because we generally have limited information concerning the process leading to success and failure, personal experiences in combination with our confidence in our relative performance can have a large influence on our perceptions of how fair the world is.

Using a 2×2 between subject design, we investigate the causal effect of success and confidence on i) meritocratic beliefs, and ii) preferences for redistribution. Participants compete in dyads in a trivia quiz and are informed that the winners of the competition are either determined by performance on the quiz (merit), or by a computerized coin-toss (luck). Participants know that the probability of the outcomes being determined by merit is between 0-100 percent, but the true probability remains unknown throughout the experiment. After learning whether they won or lost the competition, we elicit meritocratic beliefs, defined as participants' estimated percentage of winners determined by merit. Following, participants decide how to distribute earnings between another pair of competitors (consisting of a winner and a loser), for whom they know the inequality is generated though the same process as for themselves.

In the experiment, we manipulate both the outcome of the competition and participants' confidence in relative performance. The two forms of manipulation leave us with four treatment conditions: i) High confidence winners, ii) High confidence losers, iii) Low confidence winners, and iv) Low confidence losers. To manipulate participants' confidence, we we apply the the hard-easy effect (Dargnies et al., 2019; Healy and Moore, 2007; Kruger, 1999; Moore and Kim, 2003; Moore and Small, 2007). Each pair of competitors is randomized into a competition with either easy or difficult trivia questions. The underlying idea is that people fail to fully comprehend that when they find a quiz easy (hard), the quiz may be easy (hard) for all. An easy (hard) trivia quiz can thus generate more optimistic (pessimistic) beliefs about one's relative performance and possibilities to succeed given a meritocratic competition. Second, participants are either informed that they won or lost the competition. By design, 98% of the outcomes are determined by the coin-flip, and thus the treatment assignment to success and failure is (close to) random.

We show that if people act like a Bayesian, their confidence in their own relative

performance, i.e., their perceived likelihood of success in a meritocratic competition, should influence how they update their meritocratic beliefs once they learn the outcome of their own competition. Thus, we predict that an increase in confidence increases meritocratic beliefs for successful people, and decreases meritocratic beliefs for unsuccessful people. Further, we predict that people's meritocratic beliefs will affect preferences for redistribution such that successful people with higher confidence will demand less redistribution, while higher confidence for unsuccessful people will increase the demand for redistribution.

The paper offers two main findings. First, we show that increased confidence causes an increased polarization in meritocratic beliefs between successful and unsuccessful participants. While we find no significant difference in meritocratic beliefs between winners and losers with low confidence, winners with high confidence are significantly more likely to believe that outcomes are determined by merit than losers with high confidence. The finding thus suggest that people act like a Bayesian when they have high confidence, but not when they have low confidence (i.e., when they expect to fail if the competition is determined by merit). According to attribution theory, people update their beliefs about the role of merit and luck in a self-serving way, such that negative outcomes are attributed more to luck, while positive outcomes are attributed to merit (Frank, 2016; Kelley and Michela, 1980; Zuckerman, 1979). The finding in the low-confidence treatment can thus be explained by self-serving attributions. However, when participants have high confidence, i.e., believe that their chances of success are greater in a meritocratic competition than if the outcome is pure luck, Bayesian updating and attribution bias pull in the same direction. Second, we show that the outcome of the competition influences participants' preferences for redistribution above and beyond the effect of increased confidence. Increased confidence does not affect preferences for redistribution, either for winners or for losers. However, winning the competition significantly decreases the demand for redistribution, regardless of confidence treatment.

Our study contributes to multiple streams of literature. First, a number of recent studies provides correlational evidence suggesting that confidence affects preferences for redistribution (e.g., Buser et al. 2020; Heidhues et al. 2019; Kishishita et al. 2021; Ng and Semenov 2019. For example, Buser et al. (2020) find suggestive evidence of differences in (over)confidence between men and women explain why women demand more redistribution than men. Further, Ng and Semenov (2019) show that overconfident people are more likely to believe their failures are due to bad luck (rather than performance) and demand more redistribution, compared to

people who are not overconfident. To account for the fact that (over)confident people may differ on more dimensions, both observed and unobserved, we contribute to the literature by providing causal evidence that assesses how an exogenous shift in confidence affects preferences for redistribution.

Second, our study contributes to the literature on how meritocratic beliefs affect preferences for redistribution. Survey data consistently show that beliefs about the source of inequality correlates with preferences for redistribution (Alesina and Angeletos, 2005; Fong, 2001). Experimental studies suggest that this effect is causal: when outcomes are determined by luck, people redistribute significantly more than when inequalities are due to merit (Almås et al., 2020; Cappelen et al., 2007). Recent studies have suggested that experience of failure increases preferences for redistribution, even when acting as a spectator, i.e., when redistributing money between others (Cassar and Klein, 2019; Deffains et al., 2016; Espinosa et al., 2020). These studies have either provided information about the sources of success and failure (Cassar and Klein, 2019), or manipulated success with easy tasks (which arguably can affect confidence; Deffains et al. 2016; Espinosa et al. 2020). We add to the existing literature by studying the effect of success and confidence when there is *uncertainty* about the role of luck and merit, and by causally identifying the effect of *confidence* for preferences for redistribution.

Finally, our paper also contributes to the related literature on uncertainty about sources of inequality and selfish behavior, providing mixed evidence. For example, Hansson et al. (2021) show that uncertainty about procedural fairness increases losers' but not winners' selfish behavior. Both Fehr and Vollmann (2020) and Valero (2021) show that success causes a change in beliefs about success depending on merit rather than luck. While Fehr and Vollmann (2020) find that success makes people become increasingly more selfish (and thus accepting towards inequalities), Valero (2021) find no evidence that people strategically distort their beliefs about the role of merit to justify an economic advantage. We contribute to this literature on uncertainty about the sources of success by studying how success and failure effects redistribution behavior, even in the absence of selfish motives.

The structure of the paper is as follows: Section 1 outlines a conceptual framework to guide our analysis and hypotheses, Section 2 presents a description of the sample and details of the experimental design. In Section 3, we present the empirical findings, and in Section 4, we discuss broader implications of our findings.

1 Conceptual framework

Consider a situation where there is uncertainty about the underlying process leading to success and failure. Specifically, assume that the outcome is determined either by a person's performance (merit) or luck. Assume that it is common knowledge that the probability the the outcome is determined by merit is between 0 and 100%, and let people's belief about the likelihood of merit determining the outcome being given by: $p(m)$, $0 \leq p(m) \leq 1$. The perceived likelihood that the outcome is determined by luck is thus $p(l) = 1-p(m)$. Let $p(S)$ denote the perceived probability that the outcome is successful. If the outcome is determined by luck, people know that there is an equal probability of success and failure, such that $p(S|l) = 0.5$. The likelihood that they would win if it is decided by merit is given by their confidence in their own relative performance, $p(r)$, $p(S|m) \equiv p(r)$. Prior to the competition, an individual's perceived likelihood of success is given by:

$$p(S) = \underbrace{0.5}_{p(S|l)}(1 - p(m)) + \underbrace{p(r)}_{p(S|m)}p(m) \tag{1}$$

Further, assume people update their beliefs about the probability that outcomes are determined by merit after observing the outcome of the competition, success (S) or failure (F), using Bayes rule:

$$p(m|S) = \frac{p(m) \times p(S|m)}{p(m) \times P(S|m) + (1 - p(m)) \times p(S|l)} \tag{2}$$

$$p(m|F) = \frac{p(m) \times p(F|m)}{p(m) \times p(F|m) + (1 - p(m)) \times p(F|l)} \tag{3}$$

Insight I: Assuming $0 < p(m) < 1$, it follows that changes in confidence have opposite effects on the posterior belief that the outcome was determined by merit for successful and unsuccessful people:

$$\frac{\partial p(m|S)}{\partial p(S|m)} > 0$$

$$\frac{\partial p(m|F)}{\partial p(S|m)} < 0.$$

Consider a high confidence person i, who believes she performed *above* average ($p_i(S|m) = p_i(r) > 0.5$) and a low confidence person j, who believes he performed *below* average ($p_j(S|m) = p_j(r) < 0.5$). Assume further that i and j are equal in

all other aspects. If both i and j succeed, $p_i(m|S) > p_j(m|S)$. On the contrary, if both i and j lose, $p_i(m|F) < p_j(m|F)$. In other words, if i succeeds, she will be more likely to attribute the outcome to merit than j will if he succeeds, and given an observed failure, i will believe that outcomes are more likely to be determined by luck than j.

Insight II: The posterior belief about the outcome being determined by merit is higher for winners than for losers if the person believes she performed above average, but lower for winners than for losers if the person believes he performed below average.

To illustrate, consider again the high confident i and low confident j. For i, her perceived likelihood of success is higher if the competition is determined by merit than if it is determined by luck, i.e., $p_i(S|m) > p_i(S|l)$. While for j, $p_j(S|m) < p_j(S|l)$. Thus for i, $p_i(m|S) > p_i(m|F)$, while for j, $p_j(m|S) < p_j(m|F)$.

In the experiment, we manipulate the level of confidence $p(r)$ of the participants. By random assignment, we should be assured that participants only differ in their perceived likelihood of succeeding, and thus enables us to capture the *causal* effect of confidence in own performance. Hence, assuming a *successful* manipulation,i.e., significantly increasing their confidence in own relative ability, and thus their perceived likelihood of success in a meritocratic competition $p(r) \equiv p(S|m)$, the average person in the *High confidence treatment* has greater confidence than the average person in the *Low confidence treatment*. Thus, based on Insight I, we hypothesize:

H1a. *Winners in the High confidence treatment will have a higher posterior belief $p(m|S)$ than winners in the Low confidence treatment*

H1b. *Losers in the High confidence treatment will have a lower posterior belief $p(m|F)$ than losers in the Low confidence treatment*

Given a *sufficient* manipulation—meaning that the average person in the *High confidence condition* believes she performed above average and the average person in the *Low confidence condition* believes he performed below average, based on Insight II, we further hypothesize:[1]

H1c. *For participants in the High confidence condition, winners of the competition*

[1] H1c and H1d can also be seen as hypotheses for what we expect to find when comparing people who believed they performed above average to those who did not, irrespective of treatment condition, assuming that confidence is uncorrelated with other factors affecting these beliefs.

will have higher posterior beliefs that the outcome is determined by merit compared to losers.

H1d. *For participants in the Low confidence condition, winners of the competition will have lower posterior beliefs that outcomes are determined by merit compared to losers.*

Having been informed about the outcome of the competition, people are given the opportunity to redistribute income between another pair, i.e., redistribute an amount from the winner's prize to the loser. People know that the outcome is determined in the same way as for themselves, and we can therefore assume that they rely on their posterior beliefs, $p(m|S)$ / $p(m|F)$, when evaluating the inequality in another pair. Assume further that people's willingness to redistribute is decreasing in their posterior belief that the inequality is determined by merit. This assumption builds on the literature showing that people are more likely to accept inequalities resulting from merit (e.g., earned by performance) than they are to accept inequalities due to factors outside individual control (e.g., luck) (Alesina and Angeletos, 2005; Cappelen et al., 2007).[2] Following this line of reasoning, and the hypothesized relationship between increased confidence and posterior beliefs, we have the following hypotheses regarding redistributive behavior:

H2a. *Winners in the High confidence condition have a lower willingness to redistribute compared to winners in the Low confidence condition.*

H2b. *Losers in the High confidence condition have a higher willingness to redistribute compared to losers in the Low confidence condition.*

Given that H1c and H1d holds, we predict that winning will have the following effects on preferences for redistribution:

H2c. *For participants in the High confidence treatment, winners of the competition will redistribute less than losers.*

H2d. *For participants in the Low confidence condition, winners of the competition will redistribute more than losers.*

[2]This rationale can also be more formally shown, e.g., in the theoretical framework of Valero (2021) building on Cappelen et al. (2007).

2 Sample and experimental design

2.1 Sample description

Our sample consists of 1365 English-speaking participants recruited from Prolific (Palan and Schitter, 2018).[3] The sample size allows detection for small-sized effects ($d = 0.2$) with 80 % power. The experiment was programmed in LIONESS Lab (Giamattei et al., 2020), and lasted for approximately 10 minutes. Participants received £1.3 (British pounds) for participating. Depending on the outcome of the competition, and the decision made by another participant in the experiment, participants had the possibility to receive additional earnings (up to £5).

Table 1 provides an overview of the background characteristics of subjects participating in our study. Our sample is restricted to subjects with English as their first language, and most of our participants, 63 %, are UK residents. Participants are on average 34 years old and 54 % of our sample are females. With regards to occupation, 69 % are employed, while 24 % are students. Importantly, we observe that treatment conditions are balanced with respect to all of these observable characteristics.

2.2 Experimental design

The experiment is a 2×2 between-subject design, where we vary i) the difficulty level of the trivia questions, and ii) outcome of the competition. Participants who are assigned to difficult trivia questions are in a *Low confidence treatment*, while participants who are assigned to the easy tasks are in the *High confidence treatment*. Because 98% of the winners of the competition are determined by the computerized coin-toss, the outcome of the competition is almost random. Thus participants are assigned to one of four conditions: i) High confidence winners, ii) High confidence losers, iii) Low confidence winners, and iv) Low confidence losers. Everything is identical between treatments except in stage 1 (competition), and stage 2 (outcome), as described below. Figure 1 illustrates the schematic flow of the experiment.

STAGE 1. COMPETITION AND ELICITATION OF CONFIDENCE

Participants are informed that they are randomly matched with, and compete against, another participant in the study in a trivia quiz. Participants gain +1 points for every question they answer correctly, and the participant with the highest score wins the trivia quiz (in case of a tie, the participant who completed the trivia quiz

[3]For a description of attrition, see Appendix A

Table 1: Descriptive statistics

	Winner (HC)		Winner (LC)		Loser (HC)		Loser (LC)		Full sample	
	mean	sd	mean	sd	mean	sd	mean	sd	mean	sd
Female	0.57	(0.50)	0.55	(0.50)	0.54	(0.50)	0.51	(0.50)	0.54	(0.50)
Age	32.86	(12.30)	33.26	(12.13)	34.78	(13.33)	33.58	(11.95)	33.61	(12.41)
Student	0.26	(0.44)	0.26	(0.44)	0.24	(0.43)	0.23	(0.42)	0.24	(0.43)
Employed	0.68	(0.47)	0.69	(0.46)	0.69	(0.46)	0.72	(0.45)	0.69	(0.46)
UK resident	0.61	(0.49)	0.66	(0.47)	0.64	(0.48)	0.64	(0.48)	0.63	(0.48)
Observations	348		315		341		319		1365	
$P(> F)$	0.40		0.85		0.48		0.58			

Note: The table reports background characteristics of the participants for each of the treatment conditions, as well as the overall sample. "Female" captures the proportion of females; "Age" is a continuous variable measuring the participants' age in years; "Student" captures the proportion of student; "Employed" measures the proportion of employed individuals; "UK resident" gives the proportion of participants who are residents of the United Kingdom. Reported are also p-values of the overall F-statistic from regression models in which all the respective background characteristics are regressed on the respective treatment indicator variable.

faster wins). Participants learn that the outcomes for all pairs of participants in the competition will be determined by either by performance in the trivia quiz (merit) or by a computerized coin-toss (luck). Importantly, participants are informed that the probability that the outcomes in the competition is determined by their performance in the trivia competition (instead of the coin-toss) is between zero and 100 % and that the same probability applies for each pair of competitors in the study.

To manipulate confidence, we randomly assign the pair of competitors to either twelve difficult trivia questions, or twelve easy trivia questions. The pairs of participants who are assigned to relatively easy trivia questions (e.g.,What was the name of the world's first cloned mammal?) are in the *High confidence treatment*, while the pairs of participants assigned to the relatively hard questions (e.g., In which sport was Yani Tseng of Taiwan ranked world No. 1 for 109 consecutive weeks from 2011 to 2013?) are in the *Low confidence treatment*. After completing the trivia quiz, we elicit participants' confidence in their own relative ability. Participants are asked to state how they think they performed relative to the other participants in the study on a scale from 0 to 10, where 0 = among the worst 10%, and 10 = among the 10% best performances. To incentivize beliefs about relative performance, participants have the chance to win an additional 10 Tokens if their answers are correct.

STAGE 2. OUTCOME AND ELICITATION OF MERITOCRATIC BELIEFS

We manipulate success by letting 98 % of the outcomes be determined by the coin-flip and 2 % of the outcomes be determined by the trivia quiz. After learning their outcome in the competition, we elicit participants' meritocratic beliefs on a scale from 0 to 100 (where 0 = no winner is determined by merit, and 100 = all winners are determined by merit). More specifically, participants are asked to state their estimated proportion of winners they believed were determined by luck (a coin-toss), and how many of the winners were determined by merit (performance in the trivia quiz), and their answers have to sum up to 100. As noted in Stage 1, participants in this stage are also (again) informed that the probability that the outcome was determined by the trivia quiz is the same for all pairs of competitors in the competition.

STAGE 3. SPECTATOR REDISTRIBUTION DECISION

To measure participants' preferences for redistribution, participants are given the opportunity to redistribute potential additional earnings between another pair of participants. As a prize, the winners originally receive 100 additional tokens (5 pounds), and the losers gain 0 tokens. Participants can freely split 50 of the

winner's tokens between the winner and the loser. Participants are informed that 25 participants will be randomly selected to get their decision implemented, and they cannot influence their own payoff through their decision.

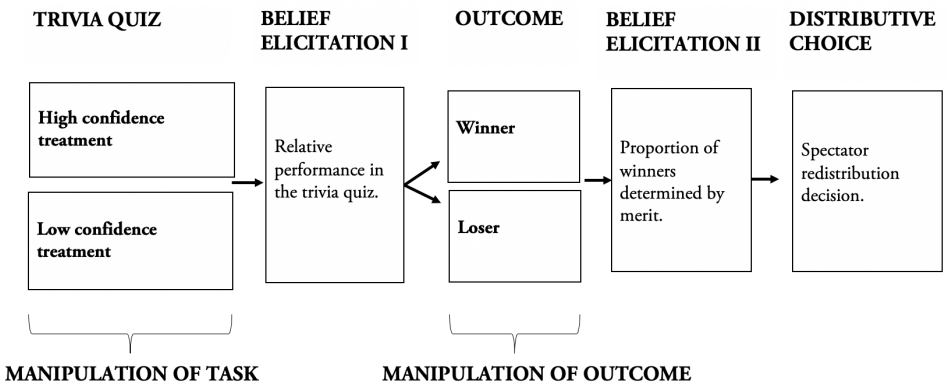


Figure 1: Schematic flow of experiment

3 Empirical results

3.1 Manipulating confidence

To test whether our experimental manipulation of confidence is successful, we study if participants in the *High confidence treatment* have higher beliefs about their relative performance compared to those assigned to the *Low confidence treatment*. Panel A of Figure 2 shows the average relative performance ratings for the participants assigned to the easy and hard trivia questions, separately. On average, participants assigned to the *Low confidence treatment* rate themselves as a 4.19 (on a scale from 0-10, where 10 is among the highest performers), whereas participants assigned to *High confidence treatment* on average rate themselves as a 7.46. Thus, the easy competition increases confidence in relative performance by 78% compared to the hard competition. The difference across conditions is large (Cohen's d = 1.37) and statistically significant ($t(1341) = 25.11$, $p < 0.001$). Figure 6 in Appendix B shows the distribution of beliefs about relative performance for each condition separately. The figure further reassures that the easy trivia questions significantly shifts the distribution of beliefs to about own relative performance to the right.

Panel B of Figure 2 shows the share of participants who believed they per-

formed above average in the *Low* and *High confidence treatment* conditions separately. Figure 2 shows that our experimental manipulation of confidence also causes a significant difference in proportion of people who believe they performed above average: In the *Low confidence treatment* only 30.1 % believe the performed above average, while the share equals 79.4 % in the *High confidence condition* ($\chi^2(1, 1343) = 335.89, p < 0.001$). This confirms that we *sufficiently* manipulated confidence: the average participant in the *High confidence treatment* believes she/he performed above average, while the average participant in the *Low confidence treatment* believes she/he performed below average.

Panel C of Figure 2 shows the share of overconfident participants across treatments. A person is defined as being overconfident if they perform below the median performance on the task while (incorrectly) believing they performed above median. As illustrated by Figure 2, our experimental manipulation of confidence also causes a significant difference in overconfidence: In the *Low confidence treatment* condition only 13.5% classify as overconfident, while the share equals 45.7% in the *High confidence treatment* ($\chi^2(1, 1331) = 166.59, p < 0.001$).

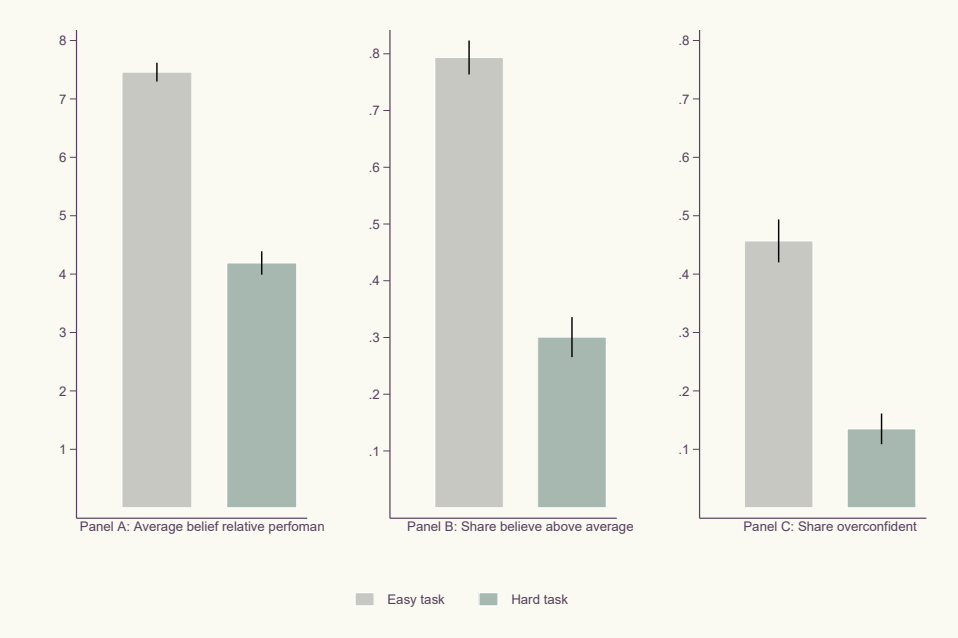


Figure 2: Average belief in relative performance and share being overconfident by confidence treatment

Note: Panel A shows the average belief in own relative performance, estimated for the different confident treatments, respectively. Relative performance is measured on a scale from 0 (believing one's performance was among the 10% worst performances), to 10 (believing one's performance was among the 10% best performances. Panel B shows the share who believe they performed above average in the competition. Panel C shows the share of people who are overconfident. Overconfidence is measured as inaccurately believing that one performed above median. Error bars show the 95% confidence intervals.

3.2 The effect of an increased level of confidence and winning on meritocratic beliefs

Figure 3 shows the distribution of meritocratic beliefs for all treatments separately. Across all treatments, there is large heterogeneity with regards to meritocratic beliefs. The modal response is 50, implying that the median participant believes that 50 percent of the winners are determined by merit, and 50 percent of the winners are determined by luck. As illustrated by Panel C, the distribution of meritocratic beliefs are largely overlapping between winners and losers in the *Low confidence treatment*, while Panel B show that the distributions of winners and losers in the *High confidence treatments* are shifted.

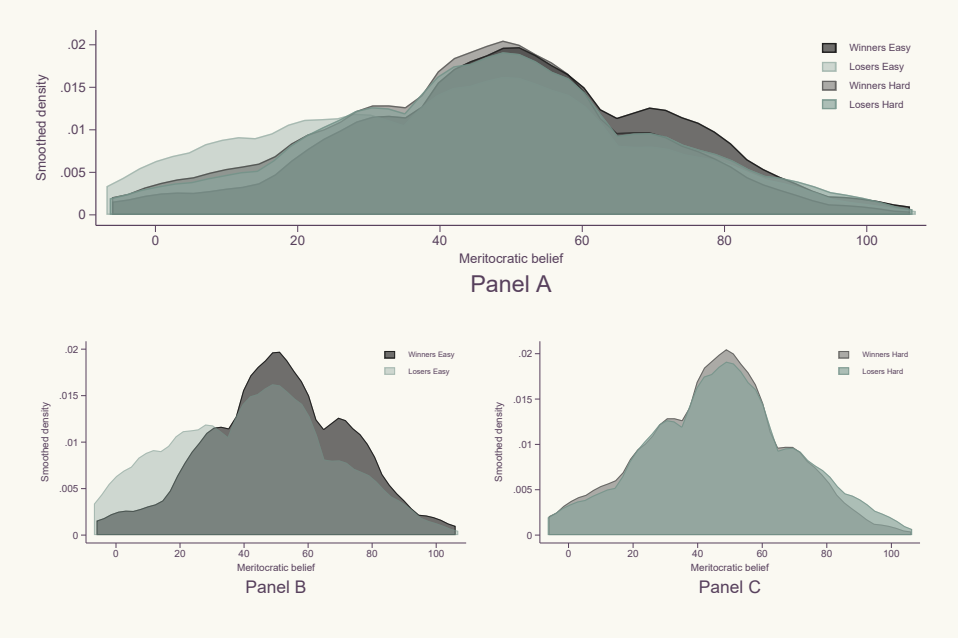


Figure 3: Kernel distribution of meritocratic beliefs by treatment condition

Note: The variable measures the probability (0-100%) that the competition was determined by merit (performance in trivia questions) as opposed to luck (coin-toss). The figures shows the distribution of the belief variable using the estimated kernel density estimates by treatment conditions.

Figure 4 shows the average meritocratic beliefs for each treatment condition separately. Based on Insight I in the conceptual framework, we predicted that winners in the *High confidence treatment* would have higher meritocratic beliefs, compared to winners in the *Low confidence treatment*. We also predicted that losers in the *High confidence treatment* would have lower meritocratic beliefs, compared to losers in the *Low confidence treatment*. This is indeed the case. Winners with high confidence have higher meritocratic beliefs ($M = 50.5\%, SD = 21.8$) compared to winners with low confidence ($M = 45.4, SD = 21.5$), $t(667) = 3.06, p = 0.002$. The opposite is true for losers; losers with low confidence believe that merit played a greater role ($M = 47.2, SD = 22.6$) compared to losers with high confidence ($M = 41.9\%, SD = 24.6$), $t(660) = 2.84, p < 0.005$. The results are robust in a regression framework where we also control for gender, age, nationality, employment, and being a student, see Table 2.

To investigate the effect of the outcome of the competition on meritocratic beliefs, we compare the difference between the winner and loser treatment. In line with our predictions, winners in the *High confidence treatment* have higher mer-

itocratic beliefs than losers ($t(692) = 4.84, p < 0.001$). In the *Low confidence treatment*, winners have lower higher meritocratic beliefs than losers, but this difference is small and not statistically significant ($t(635) = -1.04, p = 0.297$). Taken together, the results suggest that people act like a Bayesian when they have high confidence, but not when they have low confidence. Note that the theoretical predictions of attribution bias and Bayesian updating pulls in the same direction when people have high confidence, but different directions for people with low confidence. The results in the *Low confidence treatment* thus indicate that attribution bias affects how people update their meritocratic beliefs.

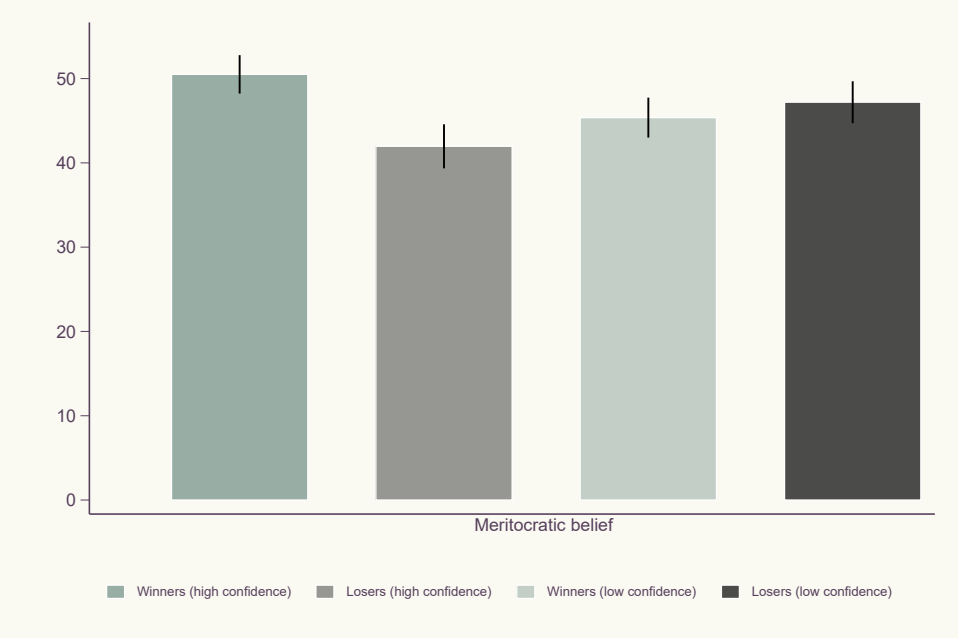


Figure 4: Average meritocratic belief by treatment condition

Note: Meritocratic belief is the estimated probability (0-100%) that the competition was determined by the trivia quiz. Error bars show 95% confidence intervals.

Table 2: Treatment effects: the effect of confidence and winning on meritocratic beliefs

	High condifence condition		Low confidence condition	
	(1)	(2)	(3)	(4)
Winner	8.538***	8.403***	-1.828	-1.655
	(1.767)	(1.775)	(1.750)	(1.766)
Female		-1.521		-1.747
		(1.818)		(1.756)
Age		-0.049		0.026
		(0.082)		(0.082)
Student		3.208		-2.077
		(2.400)		(2.376)
Employed		-0.504		-1.815
		(1.968)		(2.084)
UK resident		-0.731		0.264
		(1.856)		(1.842)
Constant	41.965***	44.555***	47.197***	48.828***
	(1.331)	(3.923)	(1.266)	(3.997)
Observations	694	688	637	634
R^2	(0.033)	(0.040)	(0.002)	(0.006)

Note: The table reports regression estimates of the treatment differences regarding meritocratic beliefs estimated separately for the *High confidence* and *Low confidence* condition. "Winner" is an indicator variable, taking the value 1 if the participant is randomly assigned to win the competition, and 0 if randomly assigned to lose. "Female" is an indicator variable, taking the value 1 if the participant is female, and 0 otherwise. "Age" is the respondent's age in years. "Student" an indicator, taking the value 1 if the respondent is a student. "Employed" is an indicator, taking the value 1 if the respondent is employed, and "UK resident" an indicator variable, taking the value 1 if the respondent is currently living in the UK. Robust standard errors reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

3.3 The effect of winning on meritocratic beliefs for different subgroups

Table 3 reports the estimated treatment effect of winning by subgroups related to different levels of confidence. The table reports estimates for the *High confidence treatment* (columns 1-3) and *Low confidence treatment* (columns 4-6) conditions separately.

In column (3) and column (6), we report the estimates for differences with respect to believing one performed above average or not. As stated in Hypothesis 1a and Hypothesis 1b we predicted that people who believe they performed above average should be more likely to believe that the outcomes are determined by merit than participants who believed they performed below average. In line with our predictions, the interaction effect presented in column (3) shows a large and significant difference is between those who believed they performed above average and those who did not, for participants in the *High confidence treatment*. Winning causes those who believe they are above average to believe it is 15.64 percentage points more likely for the competition to be determined by merit, compared to those who do not believe they are above average. We observe a similar result for participants in the *Low confidence treatment*: The treatment effect of winning is significantly higher for participants with higher confidence, compared to participants with low confidence (see column 6).

The estimates for being overconfident, i.e., for participants who *inaccurately* believe they performed above average are presented in column (2) and column (5). The results show that, in the *High confidence treatment*, overconfident participants do not have a significantly stronger treatment effect of winning than those who are not overconfident. For participants in the *Low confidence treatment*, the treatment effect of winning is significantly higher for overconfident participants, compared to participants who are not overconfident.

Finally, we study heterogeneity with regards to gender, presented in column (1) and column (3). The interaction between gender and success for participants in the *High confidence treatment*, shows that men are slightly more likely to believe that the outcomes are determined by merit when they succeed, compared to women (but the difference is only significant at the 10% level). In the *Low confidence treatment*, the results show no statistically significant differences of the effect of winning with regards to gender.

Table 3: Heterogeneity analysis of the effect winning on meritocratic beliefs estimated for high and low treatment condition separately

	High confidence treatment			Low confidence treatment		
	Female	Over-confident	Belief > average	Female	Over-confident	Belief > average
Winning	11.93***	6.890***	-3.962	-2.034	-3.445*	-5.499***
	(2.825)	(2.283)	(3.253)	(2.373)	(1.886)	(2.109)
Group	1.686	-0.691	-9.620***	-2.101	-8.241*	-4.225
	(2.714)	(2.748)	(2.827)	(2.527)	(4.228)	(2.796)
Group × Winning	-6.391*	3.215	15.64***	0.718	13.62**	12.64***
	(3.633)	(3.606)	(3.841)	(3.507)	(5.439)	(3.829)
Controls	✓	✓	✓	✓	✓	✓
Effect of winning	5.544**	10.105***	11.682**	-1.316	10.180**	7.143**
(on group)	(2.263)	(2.786)	(2.048)	(2.586)	(5.087)	(3.183)
Observations	688	688	688	634	634	634
R^2	0.044	0.041	0.059	0.006	0.016	0.025

Standard errors in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Note: The table reports regression estimates of the believed likelihood of the competition being determined by merit with robust standard errors reported in parentheses. Column headers show the indicator variable that is used to define the Group, where Group takes the value one if the indicator variable in the heading of the respective column takes the value one: Female (gender being female), Overconfident (wrongfully believing one's relative performance is above average), Belief > average (Believing one's relative performance is above average). "Controls" include the vector of individual level control variables as reported in Table 2. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

3.4 The effect of an increased level of confidence and winning on redistributive behavior

We now turn to an analysis of the effect of confidence on preferences for redistribution. Because participants are informed that the probability that the outcome is determined by merit applies for all participants, we predicted that participants' meritocratic beliefs would carry over to preferences for redistribution. More specifically, we predicted that winners in the *High confidence treatment* would redistribute less than winners in the *Low confidence treatment*. Further, we predicted that losers in the *High confidence treatment* would redistribute more than losers in the *Low confidence treatment*. We find no evidence supporting these hypotheses. As illustrated in Figure 5, we find no significant effect of increased confidence, neither for winners nor for losers. In the *High confidence treatment*, winners redistribute 24.4 Tokens, while winners with *Low confidence treatment* redistribute 24.7 Tokens ($t(661) = -0.22, = 0.825$). Further, losers in the *High confidence treatment* redistribute 33.2 Tokens, and losers in the *Low confidence treatment* redistribute 31.8 Tokens on average, which is a small and insignificant difference across conditions ($t(658) = -1.12, p = 0.259$). These results are confirmed in a regression framework where we control for gender, age and employment, see Table 2.

We further test the effect of the outcome of the competition on preferences for redistribution by comparing winners and losers. Figure 5 shows that the effect of winning significantly decreases preferences for redistribution. Winners redistribute significantly less than losers, in both the *High confidence treatment* ($t(687) = -7.25, p < 0.001$) and in the *Low confidence treatment* ($t(632) = 5.56, p < 0.001$). Altogether, we find no evidence suggesting that confidence affects preferences for redistribution. The outcome of the competition, however, has strong and significant effects on preferences for redistribution.

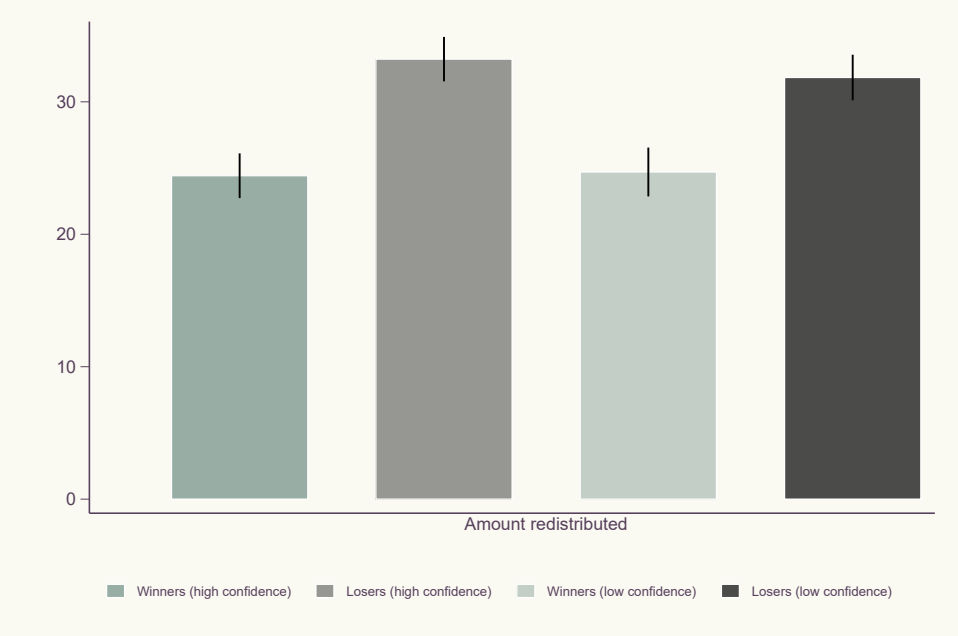


Figure 5: Preferences for redistribution measured by distributive behavior by treatment condition

Note:: Redistribution behavior is the number of Tokens (0-50) that participants redistribute from the winner to the loser. Error bars show 95% confidence intervals.

To further test if meritocratic beliefs and confidence are associated with preferences for redistribution we run a series of regression analyses, where in addition, we control for participants' meritocratic beliefs, estimation of relative performance, and overconfidence, for each treatment separately. Table 5 and Table 6 in Appendix B present the regression results. In particular, since we hypothesized that differences in meritocratic beliefs would affect preferences for redistribution, we are interested in the correlation between meritocratic beliefs and preferences for redistribution. Table 6 shows that winners' meritocratic beliefs are negatively correlated with preferences for redistribution. That is, the more winners thought the competition was determined by merit, the less they redistribute (albeit not significant at the 5% level). The estimate in Table 5 shows that this relationship is especially robust for winners in the *High confidence treatment* (see Column 1). For losers, the relationship between meritocratic beliefs and preferences for redistribution is weak and insignificant.

The regression results also shows the correlation between confidence and preferences for redistribution. While Table 5 presents the estimate of *beliefs about own relative performance* (a continuous measure between 0 – 10), Table 6 shows the

estimate for between being *overconfident* (a dummy, where 1 = overconfident and 0 = not overconfident). The regression results in Table 5 shows that losers' beliefs about own relative performance is positively correlated with preferences for redistribution, but this relationship is only significant for losers with low confidence. Further, losers who are overconfident are also more likely to redistribute more than losers who are not overconfident (see Table 6). For winners, there is no significant correlation between confidence and preferences for redistribution. The regression results show that both the estimate for beliefs about relative performance, and overconfidence is insignificant for winners. Taken together, the regression results suggest that winners' preferences for redistribution are associated with meritocratic belief, while losers' preferences for redistribution are associated with beliefs about own relative performance.

Table 4: Treatment effects: the effect of confidence and winning on preferences for redistribution

	(1) Redistribution	(2) Redistribution
Winners (high confidence)	-8.800***	-8.770***
	(1.213)	(1.223)
Winners (low confidence)	-8.518***	-8.463***
	(1.270)	(1.272)
Losers (low confidence)	-1.383	-1.195
	(1.224)	(1.234)
Female		1.454
		(0.896)
Age		0.122***
		(0.040)
Student		1.583
		(1.162)
Employed		0.103
		(1.009)
UK resident		0.712
		(0.935)
Constant	33.220***	27.308***
	(0.855)	(2.073)
Observations	1323	1314
R^2	(0.060)	(0.070)

Note: The table reports regression estimates of the treatment differences in redistributive behavior (0–50 tokens) with robust standard errors reported in parentheses. Treatment condition "Losers (low confidence)" is used as base. "Female" is an indicator variable, taking the value 1 if the participant is female, and 0 otherwise. "Age" is the respondent's age in years. "Student" an indicator, taking the value 1 if the respondent is a student. "Employed" is an indicator, taking the value 1 if the respondent is employed, and "UK resident" an indicator variable, taking the value 1 if the respondent is currently living in the UK. Robust standard errors are reported parenthesis. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

4 Concluding remarks

In this study, we manipulate the level of confidence and the outcome in a competition to study the causal effect on meritocratic beliefs and preferences for redistribution. We find that an increased level of confidence causes disparities in meritocratic beliefs between winners and losers. Winners with high confidence are significantly more likely to believe that outcomes are determined by merit than losers with high confidence, but we find no significant difference in meritocratic beliefs between winners and losers with low confidence. Furthermore, we find that that the effect of winning significantly decreases preferences for redistribution, while confidence has no significant effect on preferences for redistribution.

Our study provides two novel and important takeaways. First, our results suggest that people are 'motivated Bayesians' in the sense that they self-servingly bias the process which they update their meritocratic beliefs. When attribution bias and Bayesian reasoning pull in the same direction, people act like a Bayesian (i.e., in our high confidence treatment). But when attribution bias and Bayesian reasoning pull in opposite directions, as in our low confidence treatment, winners are slightly more likely to attribute success to luck than losers, but the difference is weak and insignificant. Second, our results suggest that experiences of success and failure are more important than meritocratic beliefs for redistributive preferences. Despite the fact that our manipulation of confidence is strong (increased belief in relative performance 78%), we find no evidence that confidence causally affects preferences for redistribution: Winners with high confidence redistribute similar amounts compared to winners with low confidence, and loser with high confidence redistribute similar amounts compared to losers with high confidence. Winners—independent of confidence treatment—do however redistribute significantly less than losers. As the outcome of the competition is randomly decided, and self-interest is eliminated from the distributive decision, our findings suggests that the manipulation of meritocratic beliefs–through increased confidence—does not translate to a change in redistributive preferences.

Our results are consistent with results from previous studies showing that winning decreases the demand for redistribution (Cassar and Klein, 2019; Deffains et al., 2016; Espinosa et al., 2020). Just as people tend to disregard underlying inequalities in opportunities and rather base rewards on observed outcomes (Andre, 2021), we find that the own outcomes of the competition have significantly higher impact on preferences for redistribution than meritocratic beliefs. While we find

no evidence that confidence causally affects redistributive preferences, our results shows a positive correlation between losers' overconfidence and their demand for redistribution, which is in line with previous studies (e.g., Ng and Semenov 2019).

We believe that our results may have important implications for policy and for future research. The lack of meritocratic values has been suggested to be one the most challenging problems a corporate professional faces when working in large and competitive corporations (Alan et al., 2021). When processes determining outcomes (e.g., as promotions and pay raises) are vague and unclear, people's subjective beliefs potentially affect employees' workplace satisfaction, likelihood of quitting, or create toxic relationships. In that sense, our results suggest that objective and transparent performance criteria are especially important in workplaces with a high degree of competition where people expect to succeed. The main take away from this study is that whereas confidence is important for understanding the formation of meritocratic beliefs, the experience of failure and success translate to preferences for redistribution.

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A Attrition

In total, 1365 participants were recruited from Prolific to participate in the experiment, and 1331 participants completed the trivia quiz. Participants who did not complete the trivia quiz were excluded from the analysis. In total, 41 participants dropped out at some part of the experiment, which resulted in a few missing observations for covariates collected in the end of the experiment. Importantly, drop-outs are random across the treatment assignment (2.8 percent in the Hard task and 2.5 percent in the Easy task, chi-2 test, $p = 0.67$).

B Supplementary Materials

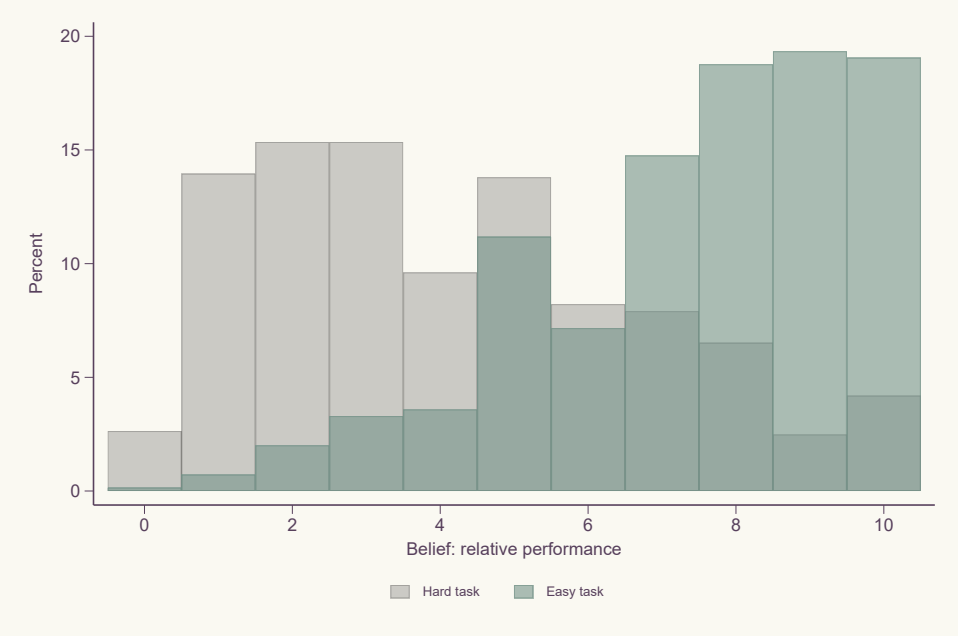

Figure 6: Distribution of belief about one's relative performance by hard and easy task condition separately

Note: The figure shows the distribution of the beliefs in relative performance, where 10 equals believing one's performance was among the 10% best performances. Grey bars shows the distribution of beliefs for participants randomized to compete solving hard trivia questions, and the green bars show the distribution of beliefs for participants solving easy trivia questions.

Table 5: The correlation between meritocratic beliefs and redistribution decisions

	Winners (High confidence)	Winners (Low confidence)	Losers (High confidence)	Losers (Low confidence)
	(1)	(2)	(3)	(4)
Belief: relative performance	0.176	-0.405	0.369	0.793**
	(0.423)	(0.386)	(0.411)	(0.354)
Meritocratic beliefs	-0.085**	-0.071	0.010	-0.063
	(0.040)	(0.044)	(0.036)	(0.039)
Female	1.714	3.554*	0.605	-0.352
	(1.800)	(1.984)	(1.748)	(1.778)
Age	0.175**	0.186**	0.147*	-0.048
	(0.079)	(0.090)	(0.075)	(0.083)
Student	2.678	3.020	1.311	-0.473
	(2.310)	(2.648)	(2.348)	(2.413)
Employed	1.044	-0.188	-0.368	-0.148
	(1.977)	(2.138)	(1.898)	(2.024)
UK resident	0.800	1.093	0.215	1.398
	(1.787)	(2.034)	(1.818)	(1.850)
Constant	18.611***	20.070***	24.426***	32.609***
	(5.088)	(5.060)	(5.152)	(4.530)
Observations	343	312	340	319
R^2	(0.035)	(0.045)	(0.015)	(0.029)

Note: The tables shows regression estimates for redistributive behavior (0–50 tokens) with robust standard errors reported in parentheses. Treatment condition "Losers (low confidence)" is used as base. "Belief: relative performance" measures the respondent's perceived relative performance measured on a scale from 1–10, where 10 represents believing one's performance is among the 10% best performances. "Meritocratic belief" is the probability with which the respondent believes the competition is determined by merit (0–100). "Female" is an indicator variable, taking the value 1 if the participant is female, and 0 otherwise. "Age" is the respondent's age in years. "Student" an indicator, taking the value 1 if the respondent is a student. "Employed" is an indicator, taking the value 1 if the respondent is employed, and "UK resident" an indicator variable, taking the value 1 if the respondent is currently living in the UK. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 6: The correlation between meritocratic beliefs and redistribution decisions

	Winners (High confidence)	Winners (Low Confidene)	Losers (High confidence)	Losers (Low Confidene)
	(1)	(2)	(3)	(4)
Overconfident	-1.060	-4.055*	3.290*	7.924***
	(1.732)	(2.400)	(1.760)	(2.638)
Meritocratic beliefs	-0.082*	-0.073*	0.004	-0.056
	(0.042)	(0.044)	(0.037)	(0.039)
Female	1.534	3.942**	0.581	-0.965
	(1.766)	(1.908)	(1.722)	(1.770)
Age	0.172**	0.189**	0.155**	-0.064
	(0.084)	(0.085)	(0.071)	(0.080)
Student	2.722	2.532	1.681	-0.566
	(2.206)	(2.572)	(2.339)	(2.300)
Employed	1.157	0.015	-0.671	0.327
	(2.093)	(2.188)	(1.796)	(2.022)
UK resident	0.756	1.180	0.576	1.114
	(1.784)	(1.997)	(1.820)	(1.872)
Constant	20.412***	18.758***	25.601***	35.464***
	(4.460)	(4.611)	(4.094)	(4.206)
Observations	343	312	340	319
R^2	(0.036)	(0.049)	(0.023)	(0.036)

Standard errors in parentheses

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Note: The tables shows regression estimates for redistributive behavior (0–50 tokens) with robust standard errors reported in parentheses. Treatment condition "Losers (low confidence)" is used as base. "Overconfident" is an indicator variable, taking the value 1 if the respondent wrongefully believes she performed above average. "Meritocratic belief" is the probability with which the respondent believes the competition is determined by merit (0–100). "Female" is an indicator variable, taking the value 1 if the participant is female, and 0 otherwise. "Age" is the respondent's age in years. "Student" an indicator, taking the value 1 if the respondent is a student. "Employed" is an indicator, taking the value 1 if the respondent is employed, and "UK resident" an indicator variable, taking the value 1 if the respondent is currently living in the UK. Robust standard errors are reported in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 7: Treatment effects: the effect of confidence and winning on meritocratic beliefs

	(1)	(2)
	Merit belief	Merit belief
Winners (high confidence)	8.538***	8.519***
	(1.767)	(1.775)
Winners (low confidence)	3.404*	3.486*
	(1.797)	(1.806)
Losers (low confidence)	5.232***	5.197***
	(1.837)	(1.850)
Female		-1.554
		(1.264)
Age		-0.016
		(0.058)
Student		0.715
		(1.690)
Employed		-1.060
		(1.435)
UK resident		-0.178
		(1.311)
Constant	41.965***	44.065***
	(1.331)	(2.981)
Observations	1331	1322
R^2	(0.019)	(0.021)

Note: The table reports regression estimates of the treatment differences regarding merit beliefs with robust standard errors reported in parentheses. Treatment condition "Losers (low confidence) is used as base. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

C Instructions

In this study, you have the possibility to gain additional earnings between 0 and 100 tokens.

10 tokens = Âč 0.5

PAIRS In the next stage, you will be paired with another participant. You will compete against this participant in a following task.

TASK You will individually complete a task. The task consists of a screen with 12 trivia questions. You gain +1 points for every question you answer correct. You have 2.5 minutes to answer the questions. The total number of correct answers represents your score in the task. Your performance in this part - how many questions you answered correctly - may influence how much you earn in this experiment. Doing more tasks will in that case always be better.

OUTCOME The winners will be determined by performance or luck with a given, unknown, probability (between 0-100 %). 1. Performance. The participants who has the highest score will win, and the other participant will lose. If both participants have the same score, the participant who completed the competition in the shortest time will win. 2. Luck. The participants who is lucky in a computerized coin-toss will win, and the other participant will lose.

THE SAME PROBABILITY APPLIES FOR EACH PAIR OF PARTICIPANTS, BUT YOU WILL NOT KNOW THE PROBABILITY.

[NEW SCREEN: HIGH CONFIDENCE TREATMENT]

QUESTION 1. What was the name of the worldâĂŹs first cloned mammal?

1. Millie
2. Tetra
3. Carrel
4. **Dolly**

QUESTION 2.

What is the ratio of the circumference of a circle to its diameter?

1. π
2. $\frac{1}{2}\pi$
3. 2π

4. π^2

QUESTION 3. From what trees do acorns grow?

1. **Oak**
2. Maple
3. Walnut
4. Beech

QUESTION 4.
Who is the patron saint of Ireland?

1. St. David
2. St. Andrew
3. St. George
4. **St. Patrick**

QUESTION 5. What color are emeralds?

1. Blue
2. **Green**
3. Red
4. Purple

QUESTION 6. Which of the following animals sleep standing up?

1. Gorillas
2. **Flamingos**
3. Cows
4. Ravens

QUESTION 7. Which of the following metals has the symbol Fe?

1. Copper

2. **Iron**

3. Nickel

4. Lead

QUESTION 8. On a farm, a kid is a baby form of what animal?

1. **Goat**

2. Cow

3. Sheep

4. Chicken

QUESTION 9. What type of animal is a crocodile?

1. Shell

2. Arthropod

3. **Reptile**

4. Arachnid

QUESTION 10. Which famous ocean liner sank on her first voyage in 1912?

1. Europa

2. Saxonia

3. *Titanic*

4. Laconia

QUESTION 11. Which planet in our Solar System is known for having a ring?

1. Uranus

2. Neptune

3. Mars

4. **Saturn**

QUESTION 12.
Which is the largest ocean in the world?

1. Atlantic
2. Indian
3. **Pacific**
4. Arctic

[NEW SCREEN: LOW CONFIDENCE TREATMENT]
QUESTION 1. A stagiary is a student of what subject?

1. Medicine
2. **Law**
3. Geology
4. Philosophy

QUESTION 2. In what year did Freddie Mercury, the lead singer of the band Queen, die?

1. 1985
2. 1989
3. **1991**
4. 1993

QUESTION 3. In which US state is John F. Kennedy buried?

1. Massachusetts
2. District of Columbia
3. Texas
4. **Virginia**

QUESTION 4. What is one full of when one is gambrinous?

1. Joy

2. **Beer**

3. Hatred

4. Regret

QUESTION 5. What is England's largest landlocked county?

1. Derbyshire

2. Oxfordshire

3. Staffordshire

4. **Shropshire**

QUESTION 6. How many Apollo missions landed humans on the moon?

1. Two

2. Five

3. **Six**

4. Nine

QUESTION 7. Where was Che Guevara killed?

1. **Bolivia**

2. Argentina

3. Cuba

4. Mexico

QUESTION 8. Suharto held the office of president in which Asian nation?

1. Malaysia

2. Japan

3. **Indonesia**

4. Thailand

QUESTION 9. What does a person with hormephobia fear?

1. Saliva
2. **Shock**
3. Worms
4. Silence

QUESTION 10.
Ouagadougou is the capital city of which African country?

1. Chad
2. **Burkina Faso**
3. Eritrea
4. Djibouti

QUESTION 11.
Which gas is formed when a hydrogen bomb is detonated?

1. Hydrogen
2. Nitrogen
3. **Helium**
4. Carbon Dioxide

QUESTION 12.
What two letters are both symbols for the number 1,000?

1. K and T
2. T and M
3. **K and M**
4. M and O

[NEW SCREEN]

How do you think you performed on the task relative to all the other participants in this study?

0 = Among the 10 % worst performances

10 = Among the 10 % best performances

Note! In this question, 10 participants will be randomly selected. If you are selected and your response match the true answer, you will earn an additional 20 tokens

[Slider] 0 âĂŞ 10

[NEW SCREEN: WINNER TREATMENT]

You won against the other participant!

[NEW SCREEN: LOSER TREATMENT]

You lost against the other participant!

[NEW SCREEN]

The outcome of this competition was by some chance determined by a lottery, and by some chance by performance. The probability is the same for all participants who participate in this competition.

Out of 100 winners, how many do you think were determined by the coin-toss vs. performance in the trivia quiz?

0 = All winners were determined by performance

100 = All winners were determined by the coin-toss

Proportion of winners determined by coin-toss: [Slider] 0 âĂŞ 100 %

[NEW SCREEN] A computer program will randomly select 25 pairs of participants (50 participants in total) who can receive an additional payment. As a prize of winning, the winners gain 100 additional tokens. The losers gain 0 additional tokens.

You will now decide how to split the bonus between one pair of participants, i.e. between a winner and a loser. Please note that your decision does NOT concern your own payoff. A computer program will at random choose 25 participants who will get their decision implemented for another pair.

Remember: 10 tokens = Âč 0.5

How many tokens do you want to take from the winner and give to the loser?

[Slider] 0 âĂŞ 50 tokens