Redistribution and Beliefs about the Source of Income Inequality

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Previous literature demonstrates that people's beliefs about the determinants of income inequality play a major role in the decision whether to support income redistribution. However, little is known about how people form these beliefs and the degree to which self-serving biases influence their formation. This study investigates whether people form self-serving beliefs regarding the extent to which work versus luck determined income inequality to justify supporting personally advantageous redistributive policies. For example, do the rich exaggerate the extent to which hard work yields success to morally justify opposing redistribution? To address this question, I conduct a laboratory experiment that exogenously varies participants' incentive to distort their beliefs. I find that participants attribute income inequality to work when they are rich, and to luck when poor, but the financial incentive of benefitting from an advantageous redistributive policy does not make this distortion any stronger. I also measure preferences over redistributive policies, and confirm that these are influenced by the elicited beliefs.

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A pre-analysis plan, describing the design, the main hypotheses to be tested and the identification strategy, was posted on the AEA RCT registry.

1 Introduction

Income inequality is of central importance in economics. Where inequality is a concern, redistributive policies constitute a widely utilized tool for obtaining greater economic equality. An important determinant of the support for these policies is the perceptions of deservingness. People are more inclined to support redistribution when they believe that income is due to circumstances beyond individual control (such as luck) rather than within individual control (such as work). This relationship has been documented by using both survey data (Fong, 2001; Alesina and Angeletos, 2005 and Alesina and Ferrara, 2005), and experimental data (Fong, 2007 and Fong and Luttmer, 2011). While it is well known that beliefs about the causes of income inequality influence the demand for redistribution, much less is known about how people form these beliefs and the extent to which they are formed self-servingly.

This paper investigates whether identifying the causes underlying economic inequality is susceptible to the formation of self-serving beliefs as a means to justify supporting redistributive policies that are personally favorable. For example, do the rich exaggerate the extent to which hard work yields success to morally justify not supporting redistribution? Because such causes are often difficult to assess, people must form judgments regarding the role that, for instance, hard work and luck played in determining success or failure. This offers an opportunity to evaluate them in a self-serving manner. Previous literature demonstrates that people actually form self-serving beliefs about the causes underlying success or failure. For instance, Deffains et al. (2016) demonstrate that those who economically succeed, even due to circumstances beyond their control, attribute more their success to circumstances within their control. The tendency to feel responsible for success but not for failure is usually interpreted by psychological studies as a need to protect or enhance self-esteem (e.g., Miller and Ross, 1975; Weiner, 1985). However, there is no evidence on whether people bias their perceptions of deservingness in the direction of their own financial self-interest. This is though plausible as we know that people engage in self-deception for financial gain (see Gino, Norton and Weber, 2016 for a review).

Understanding how people form judgments about deservingness is critical for understanding the extent to which they will support redistribution or how they will react to its implementation. Identifying a potential bias is also very important as it can contribute to polarization in attitudes towards redistribution. On the one hand, self-serving biases can reinforce the perception of deservingness of the wealthy, who can subsequently exert their political power

to change the rules to make inequality more persistent and economic class less mobile. On the other hand, if the poor overestimate the role played by luck in determining income, they will reject inequality even more and support redistributive policies to a larger extent. A political consensus about redistribution among the members of the society would then be more difficult to reach, and would be likely to increase political tensions between the rich and poor.

Observational data show a positive correlation between the extent to which a person believes that hard work brings success and income using the World Value Survey. This is consistent with the idea that beliefs are formed self-servingly. However, these data does not establish a causal relationship. For example, people who believe than hard work bring success, might be more likely to work hard, and thus have higher income. In addition, this would not allow to distinguish whether people engage in self-deception for self-esteem reasons or financial self-interest. To address this question, I conduct a laboratory experiment to test for evidence of such belief distortion, both by directly measuring beliefs and manipulating how they are formed.

In this experiment, participants perform a work task after which they receive an income—either high or low. Income is determined either according to participants' relative work performance or luck. Subjects are aware of this possibility, but do not know how much control they have over their income. I then elicit incentivized beliefs regarding the role of work performance versus luck (in an incentive compatible manner). The treatment variation consists of manipulating whether beliefs are measured before or after informing participants that they will next decide how much to redistribute from the high-income participants to low-income ones. This setting allows me to test whether beliefs reflect a self-serving bias when they are formed with knowledge that redistribution will subsequently occur. I also measure preferences over redistribution, as a way of establishing that these are influenced by the elicited beliefs.

My experiment yields several insights. First, the results show that participants attribute income inequality more to their work performance when they receive a high income, and more to luck when they receive a low income. I also find that beliefs about what causes inequality influence how much participants redistribute. Both results are consistent with previous literature mentioned earlier and described in more detail in the next section. More importantly, the results reveal that participants who receive a high income do not overestimate the importance of work when they know that they will have to decide how much to redistribute to the low-income participants afterwards. Consistently, they then support redistribution to the same extent whether or not they

were aware of the redistribution possibility when reporting their beliefs. My results thus indicate that participants form self-serving beliefs about how much control they have over their outcomes for their self-esteem, but their financial self-interest does not make this effect any stronger. This provides evidence that individuals are able to separate out their self-interest when forming beliefs about the source of income inequality.[1] This result is consistent with field findings by Dahl and Ransom (1999) that find very little evidence that Mormons bias their definition of what constitutes income for the purpose of tithing in the direction of their own financial self-interest. In addition, they also find that self-serving biases are much stronger for nonfinancial motivations.

One potential interpretation of my results is that people prefer to skew their belief in a way that boosts their self-esteem, rather than to line up with their financial self-interests. This would suggest that people are more concerned about appearing smart than fair.

My paper proceeds as follows. The next section briefly reviews some related work. Section 3 presents some empirical evidence concerning the relationship between the beliefs about the source of income and income. Section 4 describes my experimental design. Section 5 presents the results while Section 6 concludes.

2 Related Literature

Previous experimental literature provides ample evidence that the source of income inequality influences the decision whether to support income redistribution. Specifically, people redistribute less when income is earned (e.g. through work) rather than determined by luck. This has been shown using dictator games in which an individual can unilaterally decide how much to give to another person (e.g., Hoffman et al., 1994; Cherry, Frykblom and Shogren, 2002; Cappelen et al., 2007; Cappelen et al., 2013; Rey-Biel et al., 2018). This is also the case when people collectively decide—e.g., through voting—on a redistributive policy (Krawczyk, 2010; Durante et al., 2014; Lefgren et al., 2016).

However, what determines income inequality is usually difficult to assess in real-world contexts. This means that individuals must form judgments regarding what cause economic

[1] If potentially surprising, this result is nevertheless in line with recent laboratory findings that show limits about where and when people engage in self-serving deception for financial gain. For instance, Van der Weele et al. (2014) show that people do not use excuses to behave unfairly in the context of reciprocity. Bartling and Özdemir (2017) find that people do not use the replacement excuse "if I don't do it, someone else will" if a social norm of moral behavior exists. In Schneider et al. (2018), people do not use available excuses to accept immoral jobs.

success or failure. We know that these beliefs also play an important role in the demand for redistribution. In survey data, those who believe that economic outcomes are due to factors beyond individual control such as luck are more likely to support redistribution (Fong, 2001; Corneo and Grüner, 2002; Alesina and Angeletos, 2005; Alesina and Ferrara, 2005). Experimental studies have also documented such relationship (Fong, 2007; Fong and Luttmer, 2011).[2] In their studies, they manipulate the perceived deservingness of welfare recipients and confirm that these perceptions are an important determinant of the decision to share wealth with them. Indeed, participants are more likely to give when recipients are believed to be poor because of bad luck rather than lack of effort.[3]

While it is a robust finding that beliefs about the source of income are important for redistribution, very few studies investigate how people form these beliefs and the degree to which self-serving biases influence their formation. Cassar and Klein (2018) find that experience of economic failure or success shapes people's preference for redistribution, notably due to self-serving bias in responsibility attribution. This bias has been documented by psychological studies (e.g., Miller and Ross, 1975; Weiner, 1985) that shows that people tend to attribute their failure to circumstances beyond individuals' control, and their success to circumstances within their control. In the context of redistribution, Deffains et al. (2016) found that participants in a laboratory experiment who succeeded at a task in which one's relative performance was determined entirely by luck—i.e., whether one was randomly assigned to perform either a hard or an easy task—are more likely to attribute their success to factors within individual control and exhibit opposition to redistribution afterwards.[4] This is consistent with the idea that people develop self-serving notions of deservingness, which can in turn influence redistribution. However, no evidence exists that document whether people distort their perception of deservingness in the direction of their own financial self-interest.

[2] One exception is Rey-Biel et al. (2018) that find that the beliefs about other's source of income do not influence participants' willingness to give. However, they suggest that it might be due to the fact that participants care more about the source of their own income in their decision whether to give.

[3] These beliefs also play an important role in theoretical models examining the demand for redistribution (e.g., Piketty, 1995; Alesina and Angeletos, 2005 and Bénabou and Tirole, 2006).

[4] Deffains et al. (2016) also find that unsuccessful participants tend to attribute their failure to external factors and support more redistribution. However, the extent to which this is a self-serving bias is difficult to determine since these participants are actually right believing that it was beyond their individual control (they were assigned to the difficult task which did not offer any chance to outperform participants assigned to the easy task and thus to be successful).

A large body of research demonstrates that people actually engage in self-serving belief manipulation to create justifications for behaving egoistically (see Gino, Norton and Weber, 2016, for a review). For instance, individuals engage in self-deception as a justification for egoism in contexts such as dictator games (Dana, Weber and Kuang, 2007; Haisley and Weber, 2011), strategic interactions (Di Tella et al, 2015) and charitable donations (Exley, 2016). More closely related to this study, Konow (2000) and Rodriguez-Lara and Moreno-Garrido (2012) demonstrate that people distort their beliefs of what constitutes a fair redistribution in the direction of their own financial self-interest. This paper contributes to this literature by examining whether perception of deservingness are also susceptible to be formed self-servingly for financial gain.

3 Observational Data

This section examines the relationship between beliefs about the source of income inequality and income using the World Value Survey. In Table 1, I regress individuals' belief that hard work brings success against their income. The table reveals a positive and significant relationship between both variables (first column). This is also true if I include individuals' political orientation used as a proxy for the demand of redistribution (second column).[5] The third column introduces individual characteristics and countries as explanatory variables. This result is consistent with the idea that beliefs are formed self-servingly to justify supporting personally advantageous redistributive policies. However, these data only provide correlational evidence.

A key difficulty in studying self-serving biases empirically is the problem of endogeneity. First, people are more likely to work hard, and thus have higher income, if they believe than hard work bring success. Second, they can differ in dimensions that jointly determine individuals' belief about what causes income and their income. Furthermore, observational data would not allow us to distinguish whether people potentially engage in self-deception for their self-esteem or financial gain. My approach thus consists of designing a laboratory experiment where individuals face different incentives to engage in motivated reasoning, and then measuring how this affects their perception of deservingness as explained in the next section.

[5] Alesina and Angeletos (2005) make a similar use of the political orientation.

Table 1: OLS regressions of individuals' belief that hard work brings success

	(1)	(2)	(3)
Income	0.034***	0.032***	0.024***
	(0.005)	(0.005)	(0.006)
Support for Redistribution		-0.046***	-0.021***
		(0.006)	(0.006)
Constant	6.599***	6.858***	6.130***
	(0.029)	(0.044)	(0.111)
Control for Socio-eco variables	No	Yes	Yes
Control for Country	No	Yes	Yes
Observations	65744	65744	65744
R-squared	0.001	0.007	0.067

Notes: The dependent variable is individuals' belief that hard work brings success. The question asked to respondents is: "In the long run, hard work usually brings a better life" vs. "Hard work doesn't generally bring success—it's more a matter of luck and connections." This variable ranges from 1 to 10, 10 being that hard work brings success.
For *Income*, the question is: "On this card is an income scale on which 1 indicates the lowest income group and 10 the highest income group in your country. We would like to know in what group your household is".
For *Support for Redistribution,* the question is: "In political matters, people talk of left and right. How would you place your views on this scale, generally speaking?" This variable ranges from 1 to 10, 10 being the most leftist, interpreted as being the most in favor of redistribution.
The "Socio-eco" variables are gender, age, employment status, education, marital status and number of children.
All variables are from the *World Value Survey* from 2005 to 2014. The sample comprises individuals from all democratic countries available in the dataset where the use of the political orientation as a proxy for the support for redistribution makes more sense.
OLS estimates are reported, with *t* statistics in parentheses (* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent).

4 Experiment

This experiment has three parts. In Part I, participants perform a work task, after which they receive either a high or low income. However, they do not know whether their income resulted from their work performance or luck. In Part II, participants are asked to guess the causes of their income, with incentives for accuracy. In this part, the design varies whether or not subjects know that they will subsequently have to select a redistributive policy. In Part III, they have the possibility to transfer money from the participants with a high income, the "rich," to the participants with a low income, the "poor."

4.1 Experimental Design

At the beginning of the experiment, all participants are randomly paired, and the pair remains the same during the entire study (i.e., for Parts I, II and III).

Part I. This part consists of two stages: a Work Task and a Lottery. In the Work Task, participants have the opportunity to work on a simple task. Specifically, they are asked to count the number of times the number one ("1") appears in a series of grids.[6] Their goal is to solve as many grids as possible in 20 minutes.[7] The total number of grids solved represents a subject's "Work Performance." At the end of the Work Task, the computer compares the Work Performance of the paired participants. Whoever has the higher Work Performance in the pair is labeled the "winner" of the Work Task. Note that participants do not know their own absolute or relative performance levels and thus do not know whether they won the Work Task.

Part I also has a Lottery stage, in which a random draw determines, with equal probability, one of the two paired participants as the Lottery winner. As with the Work Task, participants do not know the winner of the Lottery.

At the end of Part I, the computer randomly selects which stage, the Work Task or the Lottery, determines the earnings in a pair. The winner of the selected stage receives income of CHF 30 and the paired participant receives CHF 0. This random draw is based on a probability—that Work Task determines a pair's earnings—that has been assigned to each pair. Specifically, at the beginning of Part I, the computer draws an integer from 0 to 100 with uniform probability for each pair. Participants are told that this is the "percent chance" that the Work Task, rather than the Lottery, determined the pair's earnings.

Note that, to illustrate this idea of "percent chance", I used the example of balls in an urn. Subjects are told the following: *Imagine an urn containing 100 balls. Each ball may be either blue, in which case it corresponds to Work Performance, or it may be red, in which case it corresponds to luck in the Lottery. The computer randomly selects one ball from the urn and this ball's color determines whether the earnings in a pair is based on Work Performance (blue) or luck in the Lottery (red). Thus, the number of blue balls in an urn corresponds to the percent chance that the Work Task determines the earnings in a pair, rather than the Lottery.*

At the end of Part I Participants are only informed about their income and the income of their paired participant. However, they do not know the probability that was assigned to their pair,

[6] This task, similar to the one used by Abeler et al. (2011), is usually seen as mainly depending on effort which is considered to be within individual control.

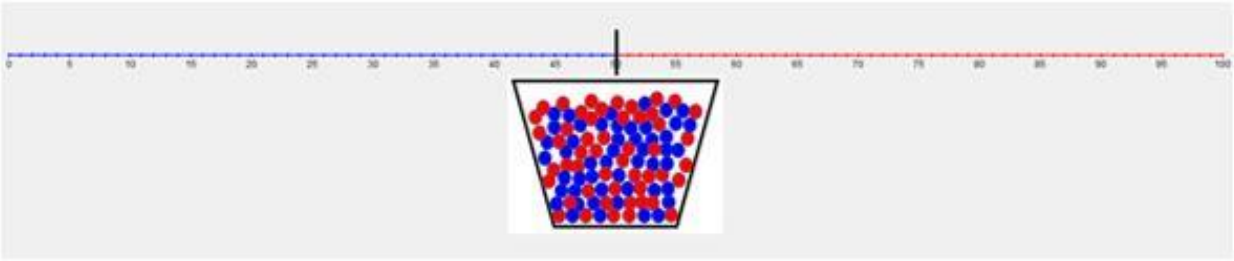
[7] Participants are told that, during the Work Task, they may take a break from solving grids, and stop working. However, they are asked to keep quiet while they take a break. This gives the opportunity to participants to believe that other might be lazy and thus responsible for their failure if it is convenient for them to think so.

nor do they know whether the subsequent draw selected performance in the Work Task or luck in the Lottery to determine those earnings.

Part II. In this part, participants are asked to guess how likely it is that the incomes in their pair were determined by the Work Task versus luck. That is, they have to guess the probability that the computer drew at the beginning of Part I. Participants provide an estimate between 0 and 100, corresponding to the percent chance that performance in the Work Task, rather than the Lottery, determined earnings in their pair. These estimates are incentivized according to the "matching probabilities" method.[8] According to this method, participants have the highest chance to earn CHF 4 if they report the percent chance they believe is true.[9]

To report their guess, participants move a slider along a bar representing the percent chance, which ranges from 0 (very left end of the slider) to 100 (very right end of the slider). This design has the specificity to allow for the full spectrum of beliefs from entirely determined by luck to entirely determined by work. As they adjust the slider to the percent chance they believe is true, the number of blue balls in an urn of 100 balls on the screen changes to illustrate their choice of the percent chance. Figure 1 provides screenshots of the slider and the urn.[10]

Figure 1. Screenshot of the slider



Notes: As an example, the position of the slider above indicates 50 percent chance, corresponding to 50 blue balls in the urn.

[8] Giving such financial incentives allows me to examine whether self-interest influences beliefs at the subconscious level. This does not imply that individuals will not protect their self-interest by (cheaply) professing to hold beliefs that benefit them.

[9] Specifically, this method is a variation of the Becker, DeGroot and Marschak (1964) method adapted to elicit probabilities, rather than willingness to pay, in an incentive compatible way (see Karni, 2009, for a more detailed description of this method). The description of this method to participants is provided in dashed frame in Instructions for Part II in Appendix E.

[10] This intuitive representation of the probability is inspired by Coutts (2018) who used an example with a gumball machine.

Part III. In this part, participants have the possibility to transfer income from the participant who received CHF 30 to the one who received CHF 0. Specifically, the participants who received CHF 30 in Part I, the "rich," decide on the transfer between 0 and 15 to implement within their pair. This transfer is then implemented. The participants who received CHF 0 in Part I, the "poor," cannot choose a transfer or influence the transfer chosen by the "rich". In the meantime, they are asked to predict how much they think the rich will redistribute.

Studying the "rich" is important since they have a greater political influence on tax policies (access to legislators through lobbying or the financing political campaigns or initiatives) and they can also often engage in voluntary redistribution through charitable donations. This makes their willingness to reduce inequality important to understand.

Treatment variation. At the beginning of the experiment, all the participants are only instructed about Part I, though they are informed that the study consists of three parts. My treatment variation consists of varying the information subjects have about Part III before participating in Part II.[11]

In an *Information* condition, participants are given a summary of Part III at the end of Part I.[12] Specifically, when informed about their income, they are also informed that in Part III, participants who received CHF 30 will have the opportunity to decide how much to redistribute to the participant who received CHF 0. They also receive a reminder of this opportunity at the end of the instructions of Part II.[13] This way, participants have the possibility to engage in self-deception about the source of their income at the time of forming beliefs in Part II, in order to make it easier to subsequently propose transfers that are more personally beneficial.

In a *No Information* condition, participants are only instructed about Part III at the beginning of Part III. Therefore, they are not aware of the redistribution phase when stating their beliefs about the source of income in Part II. Thus, these beliefs are formed without an incentive to engage in belief manipulation driven by preferences for redistribution.

4.2 Post-Experiment Questions

[11] The idea that forcing people to develop judgments before they know their self-interest in doing so prevent them to distort their judgment in their favor is illustrated in experiments on pre-trial bargaining (Babcock, Loewenstein, Issacharoff, and Camerer 1995; Babcock and Loewenstein 1997).
[12] The summary of instructions for Part III is provided in Appendix E.
[13] The instructions for Part II for both treatments are similar but for one sentence that reminds participants that Part III concerns redistribution in *Information*. The instructions for Part II can be found in Appendix E.

After Part III, participants are invited to reply to some questions about the experiment. First, I ask them to guess the belief about the probability—that the Work Task determined the earnings—reported by the high-income participants on average. This can inform us about whether people think that these beliefs are formed self-servingly. Second, participants are asked to guess the probability that their Work Performance is in the top half at the session level. This allows me to examine whether they have biased beliefs about their ability to win the Work Task. Both questions are incentivized using "matching probabilities" method described previously. Specifically, they have the highest chance to earn CHF 2 if they report their true beliefs. Furthermore, participants are offered the opportunity to know the probability the Work Task determined earnings that the computer assigned to their pair. This question helps to determine whether they engage in self-deception consciously. If they want it, and if they received a high income, I ask them whether they would have chosen another transfer. Moreover, participants are asked to rate the importance of beliefs in transfer decisions.

Finally, participants complete a questionnaire on socio-economic background and on their views regarding real-life determinants of economic success and their attitudes toward redistributive policies. This notably allows me to explore how participants' preferences for or against redistribution measured using instruments from prior research (e.g. Fong, 2001; Alesina and La Ferrara, 2005; Alesina and Angeletos, 2005) connect to their redistributive preferences in the laboratory. The list of all elicited variables, their description and summary statistics are in Appendix C.

4.3 Procedure

In total, 380 participants took part in this study. Subjects were students from the University of Zurich and the Swiss Federal Institute of Technology. I recruited them using the software h-Root (Bock et al. 2014) and conducted the experiments using the software z-Tree (Fischbacher 2007).

Before each part, participants received the experimental instructions provided in the Appendix E. In addition, an audio file with a summary of these instructions was played to establish common information regarding the experiment.

In total, I conducted 12 sessions (with about 32 participants per sessions), with each session lasted approximately 1.5 hours. On average, participants earned CHF 38 (about 38 USD), which included a show up fee of CHF 10.

4.4 Hypothesis

The standard economic assumption is that beliefs arise independently of the individuals' self-interest. However, previous psychological and economic studies report that individuals manipulate beliefs in a self-serving way. Consistent with previous literature, I expect that participants attribute income inequality to a larger extent to work when they are rich, and to luck when poor (*H1*). I also expect that the beliefs about the source of income inequality influence the demand for redistribution (*H2*). However, my main interest in this paper is to test whether people engage in self-deception concerning the source of income inequality—work versus luck—to justify supporting a personally favorable redistributive policy (*H3a*), and whether they distort their support for redistribution accordingly (*H3b*).

H1: The rich will state a higher probability that the Work Task, rather than the Lottery, determined income in their pair than the poor.

H2: The higher the probability that the Work Task, rather than the Lottery, determined income, the lower the transfer.

H3a: The rich will state a higher probability that the Work Task, rather than the Lottery, determined income in their pair under *Information* than under *No Information*.

H3b: The rich will propose a lower transfer under *Information* than under *No Information*.

5 Results

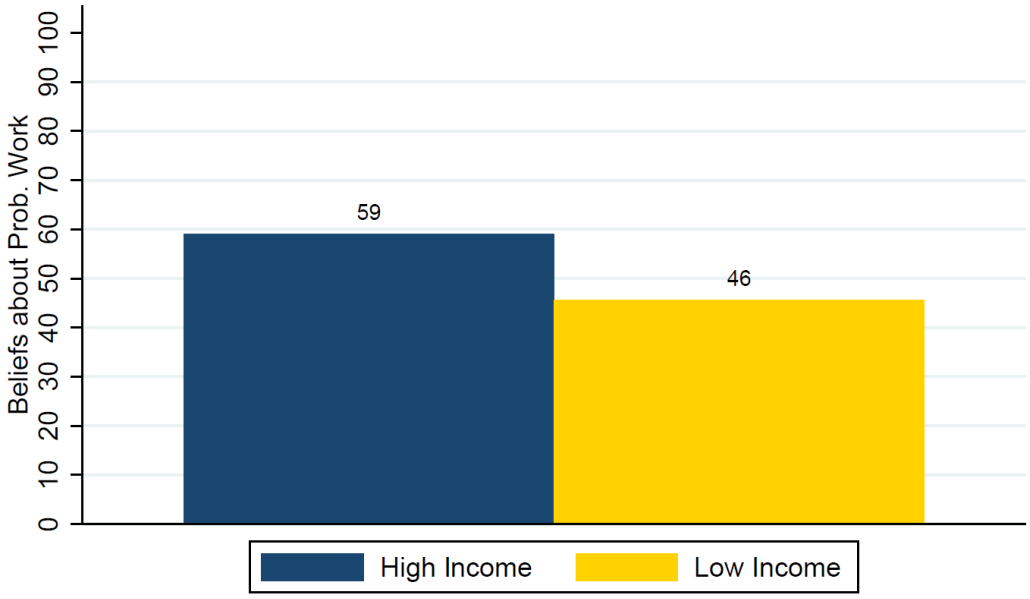
The main focus of this paper is whether people form their beliefs about the source of income inequality in a self-serving manner, and how these beliefs influence redistribution. I first compare beliefs about the probability that the Work Task determined income in a pair among high-income and low-income participants in the control treatment, *No Information*. I also examine whether these beliefs influence how much participants redistribute. Most importantly, I then compare beliefs regarding the roles of work versus luck held by the rich between conditions *No Information* and *Information*, and the subsequent transfers they implement. Finally, I look at participants' responses to post-experiment questions.

5.1 Rich versus Poor

In this sub-section, I focus on results in the *No Information* condition—i.e., when participants do not have any financial motive to engage in self-deception. I first compare beliefs regarding the

roles of work performance versus luck among the participants who received CHF 30 and those who received CHF 0. Figure 2 presents the probability that Work determined income reported by high-income and low-income participants. This reveals that beliefs differ systematically between those who obtained a high income and those who did not. On average, the rich believe that there is a higher chance that their Work Performance determine earnings in their pair (about 59 percent), while the poor think that it is more likely to be due to luck (about 54 percent). These results show slight overconfidence since the average probability is equal to 50% by design. Hypothesis 1 is supported by the data.

Figure 2. Average beliefs by income



Notes: "Beliefs about Prob. Work" on the y-axis represents the elicited beliefs about the probability that the Work Task determined income rather than the Lottery. Data concerns the treatment *No Information*.

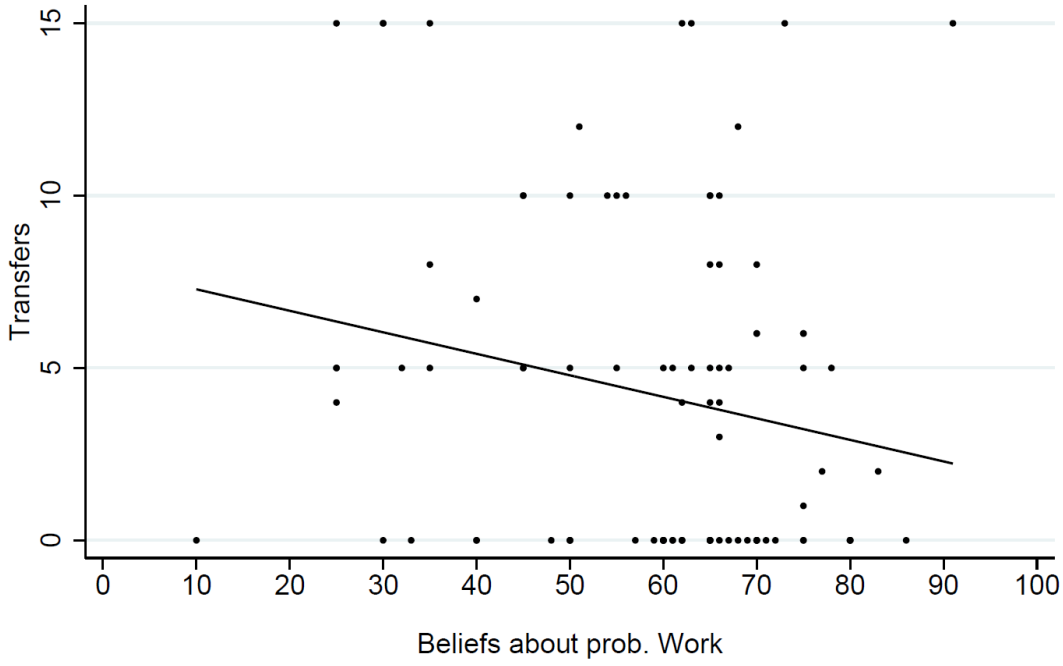
This result confirms previous findings that people tend to attribute their success to factors within their individual control, and their failure to factors beyond individual control (e.g., Miller and Ross, 1975; Weiner, 1985). Interestingly, even the rich who lost the Work Task—implying that their "success" was only due to luck—also think that it is more likely that it was due to their work, similarly to Deffains et al. (2016).[14] Reversely, even the poor who actually lost the Work

[14] As can be observed in figure D1 in Appendix D, participants who are rich because of luck report a probability that their Work Performance determine their earnings of about 54 percent on average.

Task believe that their "failure" is more due to luck than their work. In order words, poor do not consider that their failure is more likely to be due to Work Performance, even for those who actually under-perform in the Work Task. In Section 4.3, I will examine how these findings relate with their beliefs about their probability to win the Work Task.

I now examine whether these beliefs influence how much the rich transfer to the poor. Figure 3 illustrates the relationship between the transfers implemented and beliefs regarding the roles of work performance versus luck held by the rich. The solid line represents the fitted line from regressing transfers on beliefs; the coefficient being -0.062 (p-value=0.031). This reveals a negative relationship: those who believe that their Work Performance is the source of income inequality are more likely to redistribute less, while those who believe that it is due to luck are more likely to implement a higher transfer. Beliefs matter in the decision to redistribute, indicating that participants might want to manipulate them to redistribute less while feeling fair, because it is deserved. Hypothesis 2 is supported.

Figure 3. Relationship between transfers and beliefs



Notes: "Beliefs about Prob. Work" on the x-axis represent the elicited beliefs about the probability that the Work Task determined income rather than the Lottery. Each point in the scatter plot corresponds to a participant who received a high income in *No Information*. The solid line displays the fitted relationship I obtain when regressing the transfers on the beliefs.

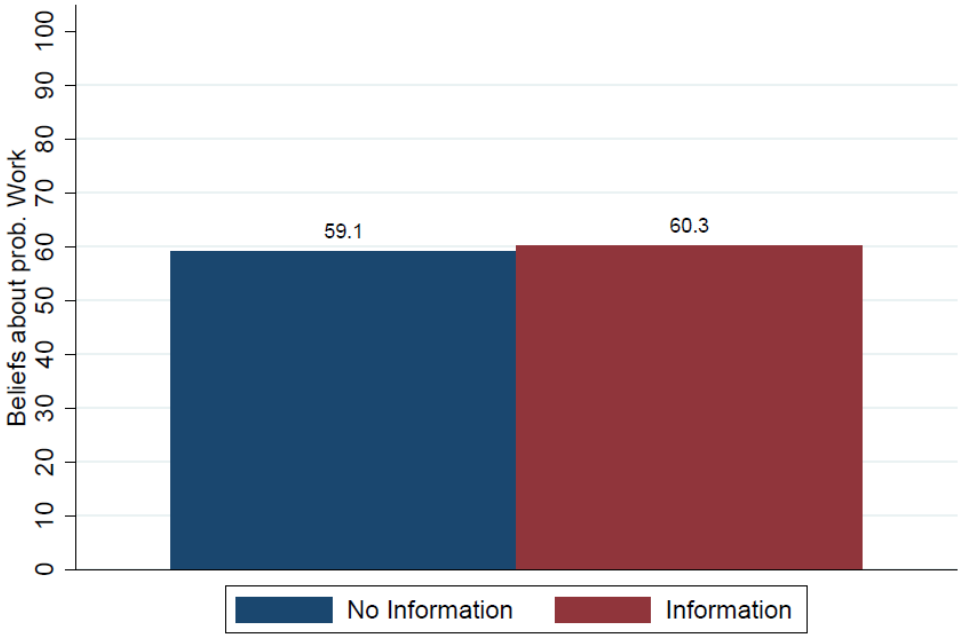
The results of this sub-section confirm the previous well-established findings that people take more responsibility for economic success than failure, and that their perception of how much

a success or failure is deserved influence their decision whether to support redistribution. I can thus be confident that the experimental design of this study is susceptible to capture any self-deception motived by a financial self-interest if any.

5.2 No Information versus Information

I now compare beliefs about the probability that the Work Task, rather than the Lottery, determined income in a pair in *No Information* and *Information*. Figure 4 shows the average beliefs of high-income participants in both treatments. This reveals that beliefs increase only very slightly in *Information*. However, this difference is statistically insignificant using a two-sided Wilcoxon rank-sum test (p=0.73). The data thus reject hypothesis *H3a*.

Figure 4. Average rich's beliefs across treatments



Note: "Beliefs about Prob. Work" on the y-axis represent the elicited beliefs about the probability that the Work Task determined income rather than the Lottery.

Table 2 presents OLS regressions that complement these observations. The dependent variable is the beliefs about the probability that the Work Task, rather than the Lottery, determined income in a pair stated by high-income participants. In Model (1) I include the binary treatment variable, *Information*, taking on value 1 if this treatment is implemented and 0 if *No Information* is implemented. Model (2) repeats this analysis but controls for gender, age and field of study, and for sessions. Model (3) introduces *Real-life beliefs (Work)*—referring to the extent to which

participants believe that hark word determines economic success in real-life context—as explanatory variable.[15] In all models, the positive coefficient for *Information* indicates slightly increased beliefs, but the impact is small and not statistically significant. This confirms that the rich do not engage in self-deception concerning the determinant of their income when they are aware of the redistributive possibility. Interestingly, in Model (3), the coefficient on *Real-life beliefs (Work)* is positive and statistically significant. This suggests that those subjects who report that economic success is more due to hard work rather than luck outside the laboratory also think that their income in the experiment is due to their Work Performance rather than luck.

Table 2. OLS regressions of rich's beliefs

	(1)	(2)	(3)
Information	1.200	1.761	1.182
	(2.313)	(2.602)	(2.578)
Real-life beliefs (Work)			3.602***
			(1.514)
Constant	59.053***	54.034***	51.526***
	(1.635)	(10.887)	(10.792)
Control for gender, age & field	No	Yes	Yes
Control for sessions	No	Yes	Yes
Observations	190	190	190
R-squared	0.001	0.110	0.138

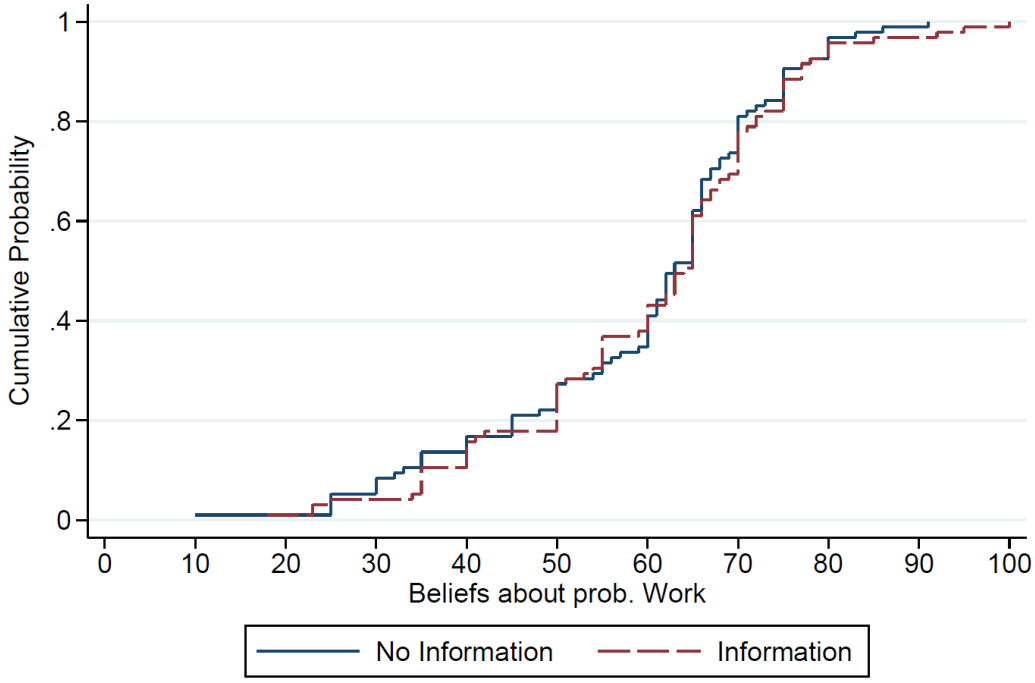
Note: OLS estimates are reported, with standard errors in parentheses (* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent).

Furthermore, Figure 5 shows the empirical cumulative distributions (CDFs) of rich's beliefs in treatments *No Information* and *Information*. This reveals that both distributions are fairly similar, as confirmed by the two-sample Kolmogorov-Smirnov test which cannot reject the equality of distributions between both treatments (p=0.987). Moreover, the CDFs reveal that less than 28 percent of high-income participants think that there is at least 50 percent chance that their income was due to luck. This suggests that about 62 percent think they have a higher chance to be

[15] For the variable *Real-life beliefs (Work)*, I use a factor analysis on answers to questions about which factors determine economic success in real-life context, and create a univariate measure of the extent to which participants believe that it is due to hard work rather than luck. The questions asked are provided in Appendix C2.

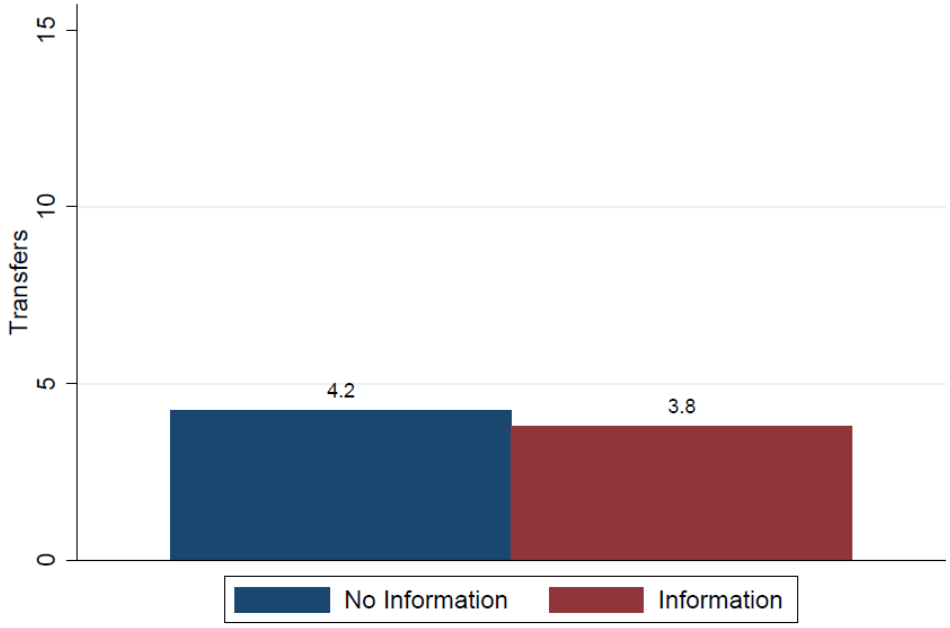
better than their paired participants in the Work Task. I will come back to the fact that high-income participants attribute more their success to work rather than luck in Section 4.2.

Figure 5 – Cumulative distribution of rich's beliefs



Second, I compare the transfers implemented by high-income participants in *No Information* and *Information*. Figure 6 presents the average transfers chosen by the rich in both treatments. As can be observed, transfers decrease only very slightly in *Information*. However, this difference is statistically insignificant using a two-sided Wilcoxon rank-sum test (p=0.48). Hypothesis *H3b* is thus rejected by the data.

Figure 6. Average transfers across treatments



Regressions of the transfers implemented in Table 3 confirm this result. In Model (1) I include the binary treatment variable *Information*. Model (2) introduces the variable *Real-life beliefs (Work)*. Model (3) repeats this analysis but controls for gender, age and field of study, and for sessions. In Model (4), I introduce *Redistributive attitudes (Support)*—referring to the extent participants support redistribution in real-life context—as explanatory variable.[16] In all models, the negative coefficient for *Information* indicates that transfers slightly decrease, but the magnitude is small and not statistically significant. This confirms that high-income participants do not transfer significantly less money in *Information*. Importantly, in Models (1), (2) and (3), the coefficient on *Real-life beliefs (Work)* is negative and statistically significant. This reveals that those high-income participants who believe that the income is their pair is more due to work rather than luck subsequently transfer less money to the low-income participants. This is consistent with previous findings that beliefs about the source of income influence the willingness to redistribute.

Returning to Table 3, Model (4) also yields some interesting insights regarding the relationship between how much they redistribute in the lab and how much they support

[16] For the variable *Redistributive attitudes (Support)*, I use a factor analysis on answers to questions about participants' redistributive attitudes, and create a univariate measure of the extent to which participants support redistribution in real-world. The questions asked are provided in Appendix C3.

redistribution outside the lab. The coefficient on *Redistributive attitudes (Support)* is positive and statistically significant, revealing that those subjects who report supporting redistribution outside the laboratory also redistribute more in the experiment.

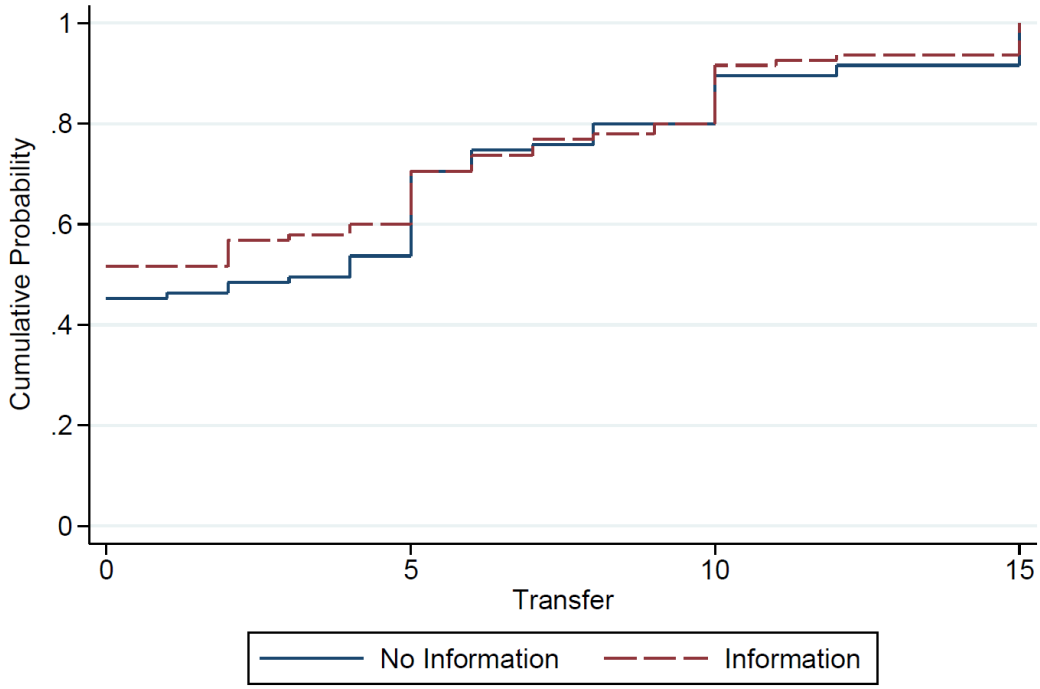
Table 3. OLS regressions of transfers

	(1)	(2)	(3)	(4)
Information	-0.442	-0.358	-0.304	-0.127
	(0.700)	(0.684)	(0.774)	(0.720)
Beliefs about probability of Work		-0.070***	-0.058***	-0.056***
		(0.022)	(0.023)	(0.021)
Redistributive attitudes (Support)				2.139***
				(0.408)
Constant	4.221***	8.341***	10.637***	11.392***
	(0.495)	(1.361)	(3.460)	(3.221)
Control for gender, age & field	No	No	Yes	Yes
Control for sessions	No	No	Yes	Yes
Observations	190	190	190	190
R-squared	0.002	0.055	0.148	0.268

Note: OLS estimates are reported, with standard errors in parentheses (* significant at 10 percent; ** significant at 5 percent; *** significant at 1 percent).

Figure 7 illustrates the CDFs of transfers implemented in treatments *No Information* and *Information*. While the distributions differ slightly, a two-sample Kolmogorov-Smirnov test cannot reject the equality of distributions when comparing both treatments (p=0.855). Figure 6 reveals that 70% of high-income participants redistributive not more than CHF 5 to their paired participants who received CHF 0. Moreover, only a minority of rich—only about 8 and 6 percent of them give CHF 15 which equalizes earnings in their pair in *No Information* and *Information*, respectively.

Figure 7. Cumulative distribution of transfers

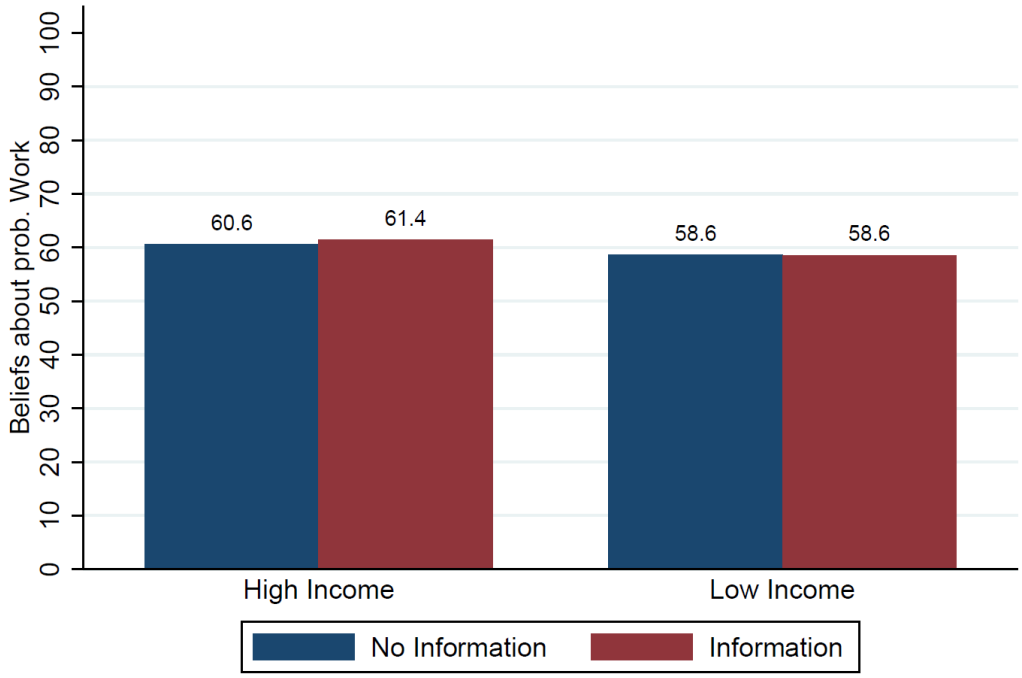


5.3 Post-Experiment Questions

I first look at whether participants think that the rich engage in self-deception regarding the role of work versus luck to justify giving less. Figure 8 displays the average guess about rich's beliefs by treatment and income. Both high-income and low-income participants do not think that the rich stated a higher probability that income was due to their Work Performance in *Information* than in *No Information*.[17] Participants have also correct beliefs about the probability that Work Task determine earnings reported by the rich—about 60 percent. This means that all participants—independently of whether they are rich or poor—guessed that the rich are more likely attribute their income to work than to luck.

[17] Using a two-sided t-test, the difference in means between treatments is not statistically significant (t(188)=-0.44, p =0.66 for the rich, and t(188)=-0.03, p =0.98 for the poor).

Figure 8. Average guess about rich's beliefs

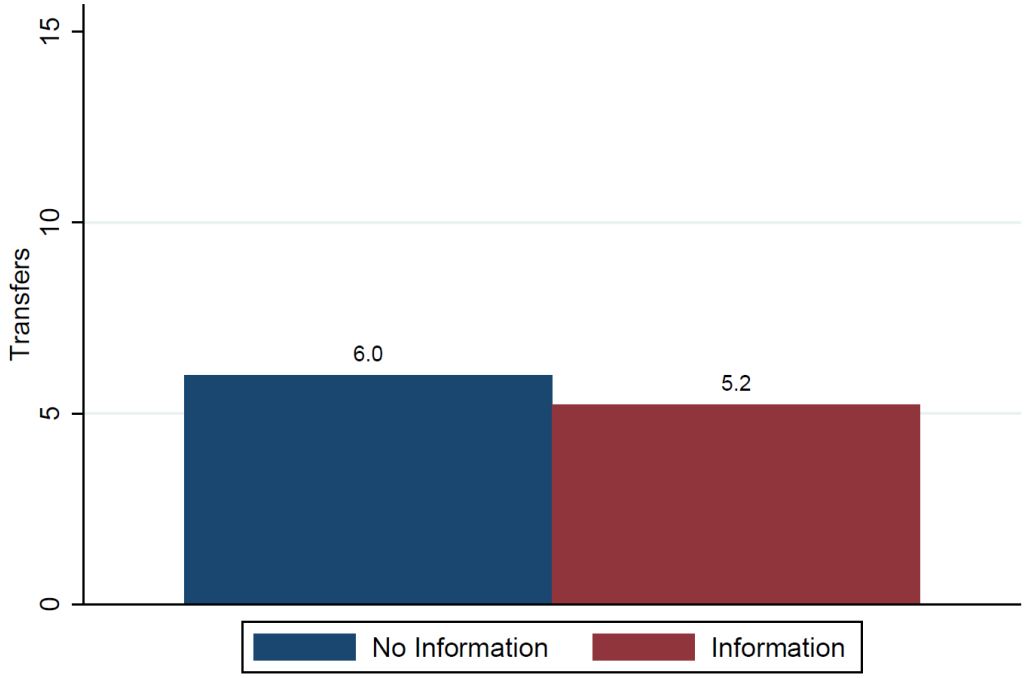


Note: "Beliefs about Prob. Work" on the y-axis represents the elicited beliefs about the probability that the Work Task determined income rather than the Lottery.

When asked how much they think the rich give at Part II, the poor predict that the rich give only slightly less in *Information* than in *No Information*, but this difference is not statistically significant as it is shown in Figure 9.[18] This is consistent with the idea that the rich do not form self-serving beliefs to redistribute less. However, poor overestimate the extent to which rich give by about CHF 2 in *Information* and CHF 1.5 in *No Information*. In the overall, participants are pretty accurate by guessing that people do not engage in self-deception to act egoistically in the context of this experiment, and that rich attribute more their success to their work than luck.

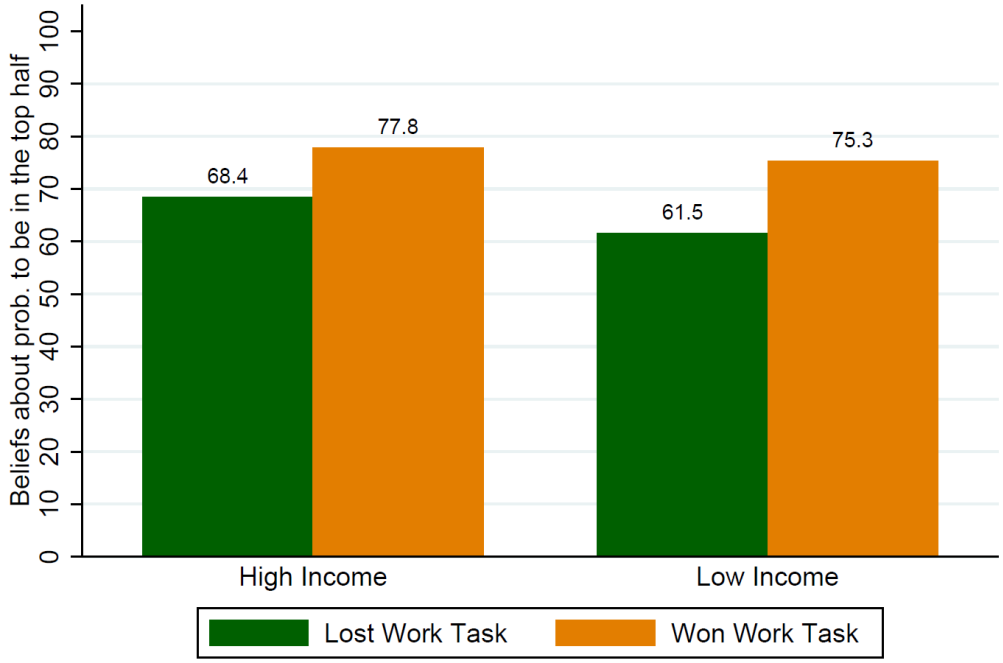
[18] Using a two-sided t-test, the difference in means between treatments is not statistically significant ($t(188)=1.06$, $p=0.29$).

Figure 9. Average transfer predicted by the poor



Returning to the finding that participants attribute their success to their work and failure to luck, this suggests that they all think that they are more likely to win the Work Task. This is supported by the answers to the questions about their probability that their Work Performance is in the top half of performances in their session. As shown in Figure 10, all participants believe that they have a higher chance to win the Work Task independently of whether they actually won and the income they received. Those who received a low income only state a slightly lower probability than the high-income participants. The under-performers, i.e. those who did not win the Work Task also report a lower probability than the winner of the Work Task, but think they have a higher chance to win it. What is striking is that even those who received a low income and actually lost the Work Task think there is a 60 percent chance that they won the Work Task.

Figure 10. Average belief about Work Performance



Notes: "Beliefs about prob. to be in the top half" on the y-axis represents the elicited beliefs about the probability that their Work Performance is in the top half at the session level. "Won Work Task" indicates that a participant is the winner of the Work Task, and "Lost Work Task" that a participant is not the winner of the Work Task. Data are pooled across treatments *No Information* and *Information*.

Interestingly, when asked whether they would like to know the probability that Work Task determine the earnings in their pair, almost all participants reply yes.[19] This suggests that people do not want to hold wrong beliefs about the source of income. Even though they do not distort their beliefs about it to justify supporting a favorable redistributive policy, they still have wrong beliefs about their probability to perform better the average.[20] Importantly, when given this information, they declare to be willing to act accordingly. Indeed, for those who want this information and who received a high income, I asked them whether they would have liked to implement another transfer. Among the 188 rich who want to know the probability that Work Task determine the earnings in their pair, 103 overestimate this probability and 83 underestimate it (thus 2 have correct beliefs). For those who overestimate it, 38 percent declare they would have given more, and for those who underestimate it, 20 percent declare they would have given less. This

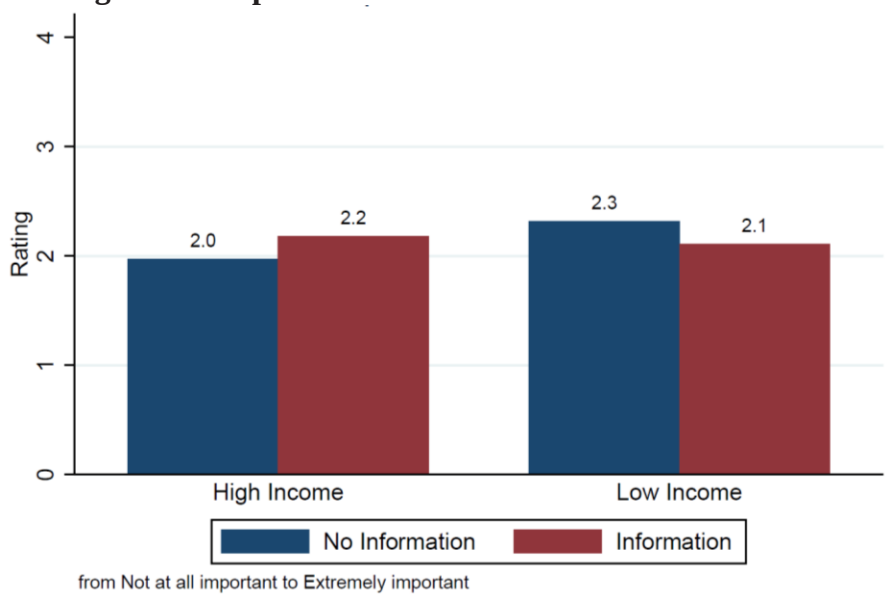
[19] In *No Information*, about 98 percent of the rich and 97 of the poor wanted to know this probability, and 100 percent of the rich and 98 of the poor replied yes in *Information*.

[20] This suggests that people do not consciously alter their perception of deservingness for self-esteem reasons, otherwise they would have probably avoided being informed about their actual control over their income.

suggests that some people are willing to change their redistributive decision when provided with accurate information. Even though any interpretation of these hypothetical answers must be done very cautiously, we could think that it is encouraging as it suggests that we could reduce the gap of the demand for redistribution between the rich and the poor by providing them more accurate information about the role of work versus luck in income determination.

Finally, I ask participants to rate the importance of beliefs in the decision to redistribute. Participants, whether they received a high or low income, give the same rating in *Information* than in *No Information*.[21] Consistent with the finding that beliefs influence redistribution, participants declare that, on average, is important.

Figure 11. Importance of beliefs in the transfer decision



Note: Rating of the importance of beliefs in transfer decisions, from 0 (not at all important) to 4 (extremely important).

6 Conclusion

Redistribution is a topic of central importance in economics. Prior research recognizes that individuals' perceptions of the deservingness of those who are impacted by redistribution can play a critical role in determining these individuals' support for different redistributive policies. However, little is known about how perceptions of the deservingness are formed. In this paper I investigate whether people evaluate the causes of income inequality in a manner that justifies

[21] Using a two-sided t-test, the difference in means between treatments is not statistically significant (t(188)=-1.10, p =0.27 for the rich, and t(188)=1.09, p =0.27 for the poor).

supporting the most favorable redistributive policies. Despite the intuitive appeal that it might be the case, which would also be consistent with the literature on motivated reasoning, I do not find that people identify the causes underlying economic inequality self-servingly for financial gain. People distort their perception of deservingness for self-esteem reasons, but the financial incentive of benefitting of an advantageous redistributive system does not make this distortion any stronger.

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Appendix

A. Summary of Instructions for Part III

Note that in Part III, the participant in the pair who received CHF 30 will have the opportunity to transfer some of these earnings to the paired participant who received CHF 0. More specifically, the participant who received CHF 30 will choose an amount to transfer between CHF 0 and CHF 15. This amount will then be transferred to the participant in the pair who received CHF 0. The participant who received CHF 0 will not be able to choose a transfer or to influence the transfer chosen by the participant who received CHF 30. This means that participants' final earnings will depend on their earnings in Part I and on the amount transferred in Part III by the participant who received CHF 30.

For the participant who received CHF 30 in Part I: Final earnings = CHF 30 - amount transferred;
For the participant who received CHF 0 in Part I: Final earnings = CHF 0 + amount transferred.

B. Post-Experiment Questions

Table B1. Description of the post-experiment variables

Variables	Description
Guessed Work Performance	Guess of the belief about the probability that the Work Task determined the earnings reported by the high-income participants on average (*incentivized*).
Guess Rich's belief	Guess of the probability that their Work Performance is in the top half at the session level (*incentivized*).
Willingness to know	Willingness to know the probability the Work Task determined earnings that the computer assigned to their pair.
Revised transfer	State of the transfer they would have liked to implement if subjects reply yes to the previous question and if they received a high income.
Importance of beliefs	Rating of the importance of beliefs in transfer decisions, from 0 (not at all important) to 4 (extremely important).

C. Questionnaire Data

Table C1. Detailed description of the socio-economic variables

Variable	Description
Female	0- No (Male); 1- Yes
Age	In years
Study	Field of study
Nationality	Country of Nationality
Disposable income	*How much money (CHF) do you have at your disposal each month (approximately, after housing costs)?*
Relative income	*How do you think your income and financial situation currently compare to those of others in Switzerland who are of similar age?* 0 - *don't know / no answer,* 1 - *much below average,* 2 - *somewhat below average,* 3 - *about the average,* 4 - *somewhat above average,* 5 - *much above average*
Working hours	*How many hours do you work per week, alongside your studies (during the semester)?*
Parents' education	*What is the highest degree or level of education completed by either of your parents?* 0 - *don't know / no answer,* 1 - *did not complete Medium school,* 2 - *Medium school,* 3 - *some college (i.e. university),* 4 - *bachelor's degree,* 5 - *master's degree,* 6 - *advanced graduate work or Ph.D.*
Family income	*Approximately, what was the highest total gross income obtained by your parents in any past year?* 0 - *don't know / no answer,* 1 - *under CHF 50'000,* 2 - *CHF 50'000 to 100'000,* 3 - *CHF 100'000 to CHF 150'000,* 4 - *CHF 150'000 to CHF 200'000,* 5 - *above CHF 200'000*
Social class	*To which social class do you think your parents belong?* 0 - *don't know / no answer,* 1 - *upper class,* 2 - *upper middle class,* 3 - *lower middle class,* 4 - *working class, 5 - lower class*
Future class	*Just your best guess, to which social class do you think you will belong in the future, say about ten years from now?* 0 - *don't know / no answer,* 1 - *upper class,* 2 - *upper middle class,* 3 - *lower middle class,* 4 - *working class, 5 - lower class*
Political orientation	*Where would you classify yourself on the left/right political spectrum?* from 1 (left-wing) to 9 (right-wing).

Table C2. Description of the views about real-life determinants of economic success

Variable	Description
View 1	*Hard work does not generally bring success, it is more a matter of luck and connections.* (-)
View 2	*The main cause of poverty is poor's lack of effort rather than bad luck.*
View 3	*The main cause of wealth is rich's hard work rather than luck.*
View 4	*There is plenty of opportunity in Switzerland today and anyone who works hard can go as far as they want.*

Note: For these questions, they have to select one of the seven answers which best describes their present agreement or disagreement with the statement, from "Completely disagree" to "Completely agree" (from -3 to 3). Note that *View 1* is reverse coded.

Table C3. Description of the redistributive attitudes

Variable	Description
Attitude 1	*Governments should redistribute wealth by taxing the rich.*
Attitude 2	*Poor people should take more responsibility to provide for themselves.* (-)
Attitude 3	*The fact that some people are rich and others are poor represents a problem that needs to be fixed through redistribution.*
Attitude 4	*The distribution of money and wealth in Switzerland today is fair, and should not be more evenly distributed among a larger percentage of the people.* (-)

Note: For these questions, they have to select one of the seven answers which best describes their present agreement or disagreement with the statement, from "Completely disagree" to "Completely agree" (from -3 to 3). *Attitude 2* and *4* are reverse coded.

Table C4. Descriptive statistics

Variable	N	Mean	SD	Min	Max
Female	380	0.52	0.50	0	1
Age	380	23.68	3.26	18	42
Disposable income	371	1020.08	5225.34	20	99999
Relative income	371	2.14	1.00	1	5
Working hours	371	7.46	9.75	0	45
Parents' education	370	3.82	1.55	1	6
Family income	303	2.57	1.54	1	5
Social class	363	3.24	0.93	1	5
Future class	365	3.78	0.68	1	5
Political orientation	380	3.98	1.75	1	9
View 1	380	0.03	1.65	-3	3
View 2	380	-0.89	1.56	-3	3
View 3	380	-0.42	1.53	-3	3
View 4	380	0.37	1.64	-3	3
Real-life beliefs *	380	-0.00	0.80	-	-
Attitude 1	380	0.94	1.61	-3	3
Attitude 2	380	0.24	1.53	-3	3
Attitude 3	380	0.29	1.61	-3	3
Attitude 4	380	0.37	1.55	-3	3
Redistributive attitude **	380	-0.00	0.83	-	-

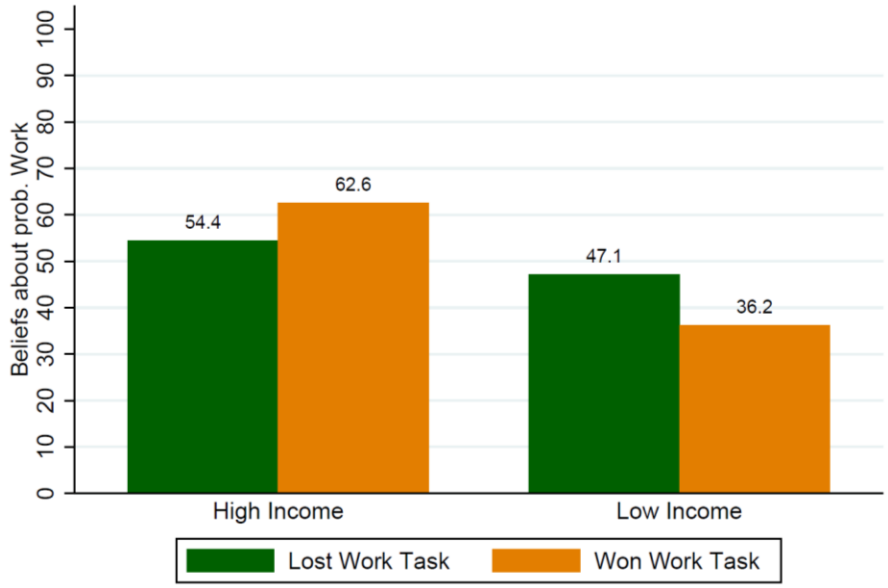
* I use a factor analysis on answers to questions about real-life determinants of economic success, and create a univariate measure of the extent to which participants believe that economic success is due to hard work rather than luck, called *Real-life beliefs.*

** I use a factor analysis on answers to questions about redistribution, and create a univariate measure of the extent to which participants support redistribution called *Redistributive attitude*.

Notes. For each variable, I excluded participants that did not reply to the question or provided implausible answers.

D. Additional Analysis

Figure D1. Average beliefs by income and success at the Work Task



Notes: "Beliefs about Prob. Work" on the y-axis represents the elicited beliefs about the probability that the Work Task determined income rather than the Lottery. Data are pooled across treatments *No Information* and *Information.* Won Work Task" indicates that a participant is the winner of the Work Task, and "Lost Work Task" that a participant is not the winner of the Work Task. I excluded ties in Work Performance that happened for 9.5 percent of participants to focus on participants who either have a higher or lower Work Performance than their paired participant.

E. Experimental Instructions

In the following, I provide the instructions for Part I, the instructions for Part II (those for the condition *Information* with the reminder of Part III at the end), and the instructions for Part III.

General instructions

Welcome to this study.

Please read the following instructions carefully. For participating in today's study you will receive **CHF 10**. During the study you may earn **additional money**. The exact amount you receive will depend on your decisions and those of the other participants. Your final payment will be given to you in cash at the end of today's study.

All of your interactions with other participants are **completely anonymous**. You will never learn the identity of the participants with whom you interact. They will also never learn your identity. You will not know which choices were made by a specific participant and no other participant will know which choices were made by you.

Communication with the other participants is strictly forbidden during the study. Violation of this rule will lead to exclusion from the study and loss of all payments.

This study will have **three parts**. We will explain **the exact procedures for Part I on the next pages**. Instructions for Parts II and III will be provided after you have completed Part I.

Instructions for Part I

At the beginning of Part I, you will be **randomly paired** with another participant. In the following, we will refer to the participant with whom you are paired as "*your paired participant.*" Note that your paired participant will **remain the same during the entire study** (i.e., for Parts I, II and III).

Part I will consist of two stages: a **Work Task** and a **Lottery**.

A. WORK TASK

In this stage, you will have the opportunity to work on a simple task. Specifically, you will be asked to count the number of times the number one ("1") appears in a series of grids. The picture below shows an example of a grid you may solve by counting the number of ones:

0	1	0	0	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0
0	0	1	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	1
0	0	0	1	0	0	0	0	1	0	0	0	0	0	1	0	1	0	0	0
0	1	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0
0	0	0	0	0	1	1	0	0	0	0	1	1	0	0	0	0	0	0	0
0	0	1	0	0	0	0	1	1	0	0	0	0	0	1	0	1	0	0	0
0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
0	1	0	0	1	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	0	1
0	0	0	1	0	0	0	0	1	0	1	0	0	0	0	0	1	0	0	0
0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0
1	0	0	0	1	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1
0	0	1	0	0	0	1	0	0	0	0	0	0	1	1	0	1	0	0	1
0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0
0	0	0	1	1	0	0	0	1	0	0	0	0	0	0	1	0	1	0	0
0	1	0	1	0	0	0	0	0	0	0	0	0	1	0	1	0	1	0	1
0	0	0	0	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0
0	0	0	0	1	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0
0	0	1	0	0	1	0	0	0	0	1	0	0	0	0	1	0	0	0	1

In the above example, the grid contains 78 ones. The correct answer is thus 78.

After you have entered your answer (i.e., the number of ones in the grid) and clicked the "OK" button, the computer will check your answer. If you enter the correct number the computer will count that grid as solved. If you enter an incorrect number the computer will not count that grid as solved. The computer will not tell you whether or not you solved the grid. In either case you will then see a new grid. All participants will be presented with the same grids.

Your goal is to solve **as many grids as possible.** The total number of grids solved represents your performance in this Work Task, namely your **Work Performance**.

You will have **20 minutes** to solve as many grids as you can. During the Work Task, you may decide to take a break from counting the number of ones, and thereby solving grids, and to stop working. However, the time will continue counting down while you take a break. If you decide to take a break please remain seated in front of your computer and keep quiet.

At the end of the Work Task, the computer will compare your Work Performance with the Work Performance of your paired participant**. Whoever has the higher Work Performance in the pair will be the winner of the Work Task.** That is, the person in your pair who **performs best** on the Work Task will be the winner. Note that **neither you nor your paired participant will know** who is the winner of the Work Task**.**

(*If both you and your paired participant have the same Work Performance the computer will randomly select one of you as the winner.*)

B. LOTTERY

In this stage, **luck will determine which participant in your pair** (i.e., you or your paired participant) **is the winner of a Lottery**. Essentially, the computer will flip a coin to select one of you as the winner. Each participant in a pair has the same chance to be selected as the winner of the Lottery. Note that **neither you nor your paired participant will know** who is the winner of the Lottery.

C. EARNINGS

After all participants have participated in the Work Task and the Lottery, the computer will **randomly select one of the two stages to determine each pair's earnings**. This means that the earnings in your pair will be either the result of your and your paired participant's Work Performance or luck in the Lottery. The winner of the selected stage will receive CHF 30 and the paired participant will receive CHF 0.

Specifically,

- If the computer selects the Work Task, then the winner of the Work Task will receive CHF 30 and the paired participant will receive CHF 0. *This means that earnings are entirely the result of which participant has a higher Work Performance.*

- If the computer selects the Lottery, then the winner of the Lottery will receive CHF 30 and the paired participant will receive CHF 0. *This means that earnings are entirely the result of which participant has more luck in the Lottery.*

At the beginning of Part I, the computer will **determine for each pair a percent chance that the Work Task,** rather than the Lottery, **will determine that pair's earnings**. The percent chance that Work Performance, rather than luck in the Lottery, will determine the earnings in your pair is called *p*. A different percent chance is allocated to each pair, and *p* can take any value (integer) between 0 and 100, with each value being equally likely to be drawn.

At the end of Part I, the computer will use a random draw **based on *p*** to determine whether the Work Task, rather than the Lottery, will determine the earnings in your pair.

To better understand this idea of "percent chance", let's illustrate it with the example of balls in an urn. Imagine an urn containing 100 balls. Each ball may be either blue, in which case it corresponds to Work Performance, or it may be red, in which case it corresponds to luck in the Lottery. The computer will randomly select one ball from the urn and this ball's color will determine whether the earnings in a pair will be based on Work Performance (blue) or luck in the Lottery (red).

Thus, the **number of blue balls** in an urn corresponds to the **percent chance** that the Work Task will determine the earnings in a pair, rather than the Lottery.

For example, if an urn contains:

- 0 blue balls (and thus 100 red balls), this means that there is a 0 percent chance (i.e., there is no chance) that Work Performance will determine the earnings in a pair. Thus, it is certain that the earnings in a pair will be determined by luck in the Lottery.
- 50 blue balls (and thus 50 red balls), this means that there is a 50 percent chance (i.e., it is equally likely) that Work Performance will determine the earnings in a pair. Thus, it is also equally likely that the earnings in a pair will be determined by luck in the Lottery.
- 100 blue balls (and thus 0 red balls), this means that there is a 100 percent chance (i.e., it is certain) that Work Performance will determine the earnings in a pair. Thus, there is no chance that the earnings in a pair will be determined by luck in the Lottery.

The actual number of blue and red balls can be anywhere between 0 and 100. Also, remember that each pair has its own designated urn containing a random number of blue (and thus red) balls. The computer will generate your pair's urn at the beginning of Part I, and a ball will be randomly drawn from this urn at the end of Part I to determine your pair's earnings.

You will only be informed about your earnings and the earnings of your paired participant. However, you will NOT know the percent chance that was assigned to your pair, nor will you know whether those earnings were based on Work Performance or luck in the Lottery. That is, you will not know the exact composition of your designated urn in terms of blue and red balls, nor the color of the ball randomly drawn.

Summary of Part I:

- The computer will randomly form pairs of participants.

- The computer will determine, for each pair, a percent chance, *p*, that Work Performance will determine that pair's earnings. That is, the computer will generate an urn for each pair.

- All participants will participate in the Work Task. The person in the pair with the higher Work Performance will be the winner of the Work Task. Participants will not know who is the winner of the Work Task.

- All participants will participate in the Lottery. The computer will determine, by chance, one person in the pair to be the winner of the Lottery. Participants will not know who is the winner of the Lottery.

- The computer will use a random draw based on *p* to determine whether Work Performance, rather than luck in the Lottery, will determine the earnings in a pair. That is, a ball will be randomly drawn from each pair's designated urn to determine that pair's earnings.

- The winner of the selected stage (i.e., Work Task or Lottery) will receive CHF 30, and the other participant in the pair will receive CHF 0.

- Participants will only learn about their earnings and the earnings of their paired participant, not about the percent chance *p* that the computer assigned to their pair, nor the stage selected to determine their pair's earnings. That is, participants will not know the exact composition of their designated urn in terms of blue and red balls, nor the color of the ball drawn.

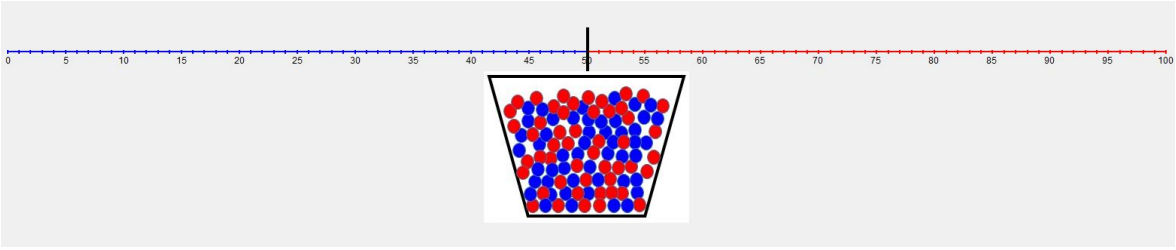
If you have any questions, please raise your hand and wait for an experimenter.

Instructions for Part II

In Part II, you will be asked to **guess how likely it is that the earnings in your pair were determined by Work Performance** rather than by luck in the Lottery. That is, we ask you to guess the percent chance, namely *p*, that the earnings in your pair are entirely the result of your and your paired participant's Work Performance.

Using the example of balls in an urn, we ask you to guess the number of blue balls in the urn that the computer generated for your pair. Recall that the number of blue balls corresponds to the chance that Work Performance, rather than luck in the Lottery, determined the earnings in your pair.

To report your guess, you will **move a slider** along a bar representing the percent chance, *p*, which ranges from 0 (very left end of the slider) to 100 (very right end of the slider). As you adjust the slider to the percent chance *p* you believe is true, the number of blue balls in an urn of 100 balls on the screen will change to illustrate your choice of *p*. The picture below shows the slider you will be asked to move. Note that the position of the slider below (i.e., *50 percent chance, corresponding to 50 blue balls in the urn*) is just an example to illustrate the connection between the percent chance *p* and the number of blue balls in your designated urn.



Your task in Part II is to position the slider to indicate how likely you believe that Work Performance, rather than luck in the Lottery, determined the earnings in your pair. This is the same as using the slider to create an image of the urn that you believe determined the earnings for your pair.

Incentives to accurately report your best guess about the percent chance *p*

To give you an incentive to think carefully about the percent chance you believe that the earnings in your pair were determined by Task Performance, rather than luck in the Lottery, we introduce an "accuracy" payment rule that we explain in detail below.

Before explaining this rule, we point out a simple property it has: **you have the highest chance to earn money when you indicate exactly what you think is the percent chance *p* that the earnings in your pair were determined by Work Performance** (e.g., if you think there is 75 percent chance the earnings in your pair were determined by Work Performance, you should report a value of 75, and not something higher or lower, in order to earn the most money).

We now explain how the accuracy payment rule works. Your best guess about *p* essentially determines on which of two urns you prefer to bet in order to win an additional CHF 4 payment. By making a guess of *p*, you indicate whether you prefer to bet either on your pair's designated urn (which has an actual percent chance *p* of winning you CHF 4) or on a different urn with a percent chance *x* of winning you CHF 4.

At the end of Part II the computer will randomly draw a random number, *x*, between 0 and 100 (all the numbers are equally likely to be drawn). The computer will then compare *x* to the value you provided as your best guess of *p*.

- **If your best guess of *p* is higher than x**, then the computer will draw a ball **from your pair's designated urn** and will pay you CHF 4 if the ball is blue and CHF 0 if the ball is red.

- **If your best guess of *p* is equal to or lower than x**, then the computer will draw a ball **from an urn containing *x* blue balls** and (100 – *x*) red balls and will pay you CHF 4 if the ball is blue and CHF 0 if the ball is red.

This means that you should indicate, as your best guess of *p*, the exact number of blue balls that you believe your pair's designated urn contains. If you indicate a higher number, then you may end up with your designated urn when you would have preferred having the urn with *x* blue balls. If you indicate a lower number, then you may end up with the urn with *x* blue balls when you would have preferred having your designated urn.

If this description seems complicated, remember that **you have the highest chance to earn money if you report the percent chance you truly believe was assigned to your pair**, i.e., how many blue balls you believe were in your designated urn.

You will be informed about whether or not you received the additional CHF 4 at the end of the experiment.

Summary of Part II:

- All participants will be asked to report their best guess about the percent chance that Work Performance, rather than luck in the Lottery, determined the earnings in their pair.

- All participants can expect to earn the most money by reporting the actual value of *p* they believe is true.

- All participants will learn whether they receive CHF 4 at the end of the experiment.

Instructions for Part III will be provided after Part II is completed. Remember that in Part III, the participant who received CHF 30 will have the opportunity to transfer some of these earnings to the paired participant who received CHF 0.

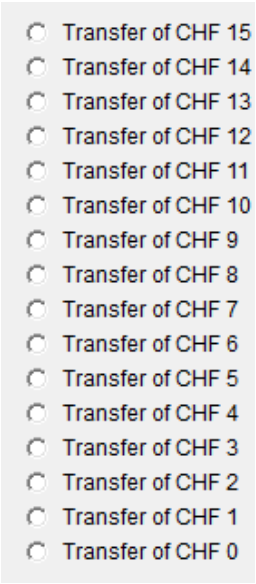
If you have any questions, please raise your hand and wait for an experimenter.

Instructions for Part III

Recall that, within your pair, one participant received CHF 30 and the other received CHF 0 in Part I.

In Part III, **the participant in the pair who received CHF 30 will have the opportunity to transfer some of these earnings to the paired participant who received CHF 0**. More specifically, the participant who received CHF 30 will choose an amount to transfer between CHF 0 and CHF 15. This amount will then be transferred to the participant in the pair who received CHF 0. The participant who received CHF 0 will not be able to choose a transfer or to influence the transfer chosen by the participant who received CHF 30.

To make his/her choice, the participant who received CHF 30 will see **16 possible transfers**, as shown in the picture below. He/she will select the one he/she would like to implement within the pair.



Note that for each possible transfer, we will also indicate the subsequent earnings for both paired participants.

Your final earnings

Your final earnings depend on your earnings in Part I and on the amount transferred in Part III by the participant who received CHF 30.

► If you received CHF 30 in Part I: Your final earnings = CHF 30 – amount transferred

► If you received CHF 0 in Part I: Your final earnings = CHF 0 + amount transferred

You will be informed about your final earnings, and whether or not you received the additional CHF 4 from Part II at the end of today's study.

Summary of Part III:

The participant in the pair who received CHF 30 will have the opportunity to transfer some of these earnings to the paired participant who received CHF 0.

If you have any questions, please raise your hand and wait for an experimenter.