

Fehr, Dietmar; Reichlin, Yannick

Working Paper

Status, Control, and Risk: How Relative Wealth Perceptions Shape Risk-Taking

CESifo Working Paper, No. 9253

Provided in Cooperation with:

Ifo Institute – Leibniz Institute for Economic Research at the University of Munich

Suggested Citation: Fehr, Dietmar; Reichlin, Yannick (2025) : Status, Control, and Risk: How Relative Wealth Perceptions Shape Risk-Taking, CESifo Working Paper, No. 9253, CESifo GmbH, Munich

This Version is available at:

<https://hdl.handle.net/10419/245434.2>

Standard-Nutzungsbedingungen:

Die Dokumente auf EconStor dürfen zu eigenen wissenschaftlichen Zwecken und zum Privatgebrauch gespeichert und kopiert werden.

Sie dürfen die Dokumente nicht für öffentliche oder kommerzielle Zwecke vervielfältigen, öffentlich ausstellen, öffentlich zugänglich machen, vertreiben oder anderweitig nutzen.

Sofern die Verfasser die Dokumente unter Open-Content-Lizenzen (insbesondere CC-Lizenzen) zur Verfügung gestellt haben sollten, gelten abweichend von diesen Nutzungsbedingungen die in der dort genannten Lizenz gewährten Nutzungsrechte.

Terms of use:

Documents in EconStor may be saved and copied for your personal and scholarly purposes.

You are not to copy documents for public or commercial purposes, to exhibit the documents publicly, to make them publicly available on the internet, or to distribute or otherwise use the documents in public.

If the documents have been made available under an Open Content Licence (especially Creative Commons Licences), you may exercise further usage rights as specified in the indicated licence.

Status, Control, and Risk: How Relative Wealth Perceptions Shape Risk-Taking

Dietmar Fehr, Yannick Reichlin

Impressum:

CESifo Working Papers

ISSN 2364-1428 (electronic version)

Publisher and distributor: Munich Society for the Promotion of Economic Research - CESifo GmbH

The international platform of Ludwigs-Maximilians University's Center for Economic Studies and the ifo Institute

Poschingerstr. 5, 81679 Munich, Germany

Telephone +49 (0)89 2180-2740, Telefax +49 (0)89 2180-17845, email office@cesifo.de

Editor: Clemens Fuest

<https://www.ifo.de/en/cesifo/publications/cesifo-working-papers>

An electronic version of the paper may be downloaded

· from the SSRN website: www.SSRN.com

· from the RePEc website: www.RePEc.org

· from the CESifo website: <https://www.ifo.de/en/cesifo/publications/cesifo-working-papers>

Status, Control, and Risk: How Relative Wealth Perceptions Shape Risk-Taking*

Dietmar Fehr

University of Stuttgart and CESifo

Yannick Reichlin

Bocconi University

May 30, 2025

Abstract

We embed an experiment in a large-scale representative survey to investigate how relative wealth affects risk-taking and how this effect varies as a function of perceived control over life outcomes. Our results contest the common prediction of higher risk-taking in the middle of the distribution. Instead, we find that respondents who are induced to perceive their relative wealth as low display more tolerance towards risk in a subsequent incentivized risk-taking task. This effect is not uniform but is mainly driven by individuals who more firmly believe that life outcomes are beyond their control.

Keywords: relative wealth, risk preferences, survey experiment, locus of control

JEL classification numbers: C93, D31, D81, D91, E21

*We thank Sule Alan, Davide Cantoni, Alexander Cappelen, Russell Cooper, David Levine, Andrej Gill, Ingar Haaland, Ed Hopkins, Andrea Ichino, Tatiana Kornienko, Lance Lochner, Armando Meier, Alexander Monge-Naranjo, Ricardo Perez-Truglia, Mirjam Reutter, Guido Schwerdt, Frederick Schwerter, Hitoshi Shigeoka, Holger Stichnoth, and Jan Stuhler for excellent feedback. We also received valuable comments from seminar participants in Basel, Bergen, Berlin, Bonn, Florence, Frankfurt, Heilbronn, Helsinki, Konstanz, Kreuzlingen, Stuttgart, Rotterdam, Tuebingen, and Zurich, and at various conferences. Federico Acarregui Pascual provided outstanding research assistance. We thank Sebastian Schneider and Sebastian Riedmiller for sharing their code for the wealth estimation. We are grateful to the Deutsche Forschungsgemeinschaft (DFG) for financial support through individual grant FE 1452/3-1 (Fehr). The authors declare that they have no relevant or material financial interests that relate to the research described in this paper.
E-mail: dietmar.fehr@iwr.uni-stuttgart.de and yannick.reichlin@unibocconi.it

1 Introduction

Relative consumption and relative wealth are essential components of well-being, and economists have long recognized that such positional concerns create an appetite for risk-taking (Friedman and Savage, 1948).¹ Recent theoretical models have formalized this observation by directly building status and relative rank into the utility function. They are split into two broad camps: some largely support the Friedman–Savage view about risk-taking in the middle of the distribution (Robson, 1996; Becker et al., 2005; Ray and Robson, 2012), whereas others argue it instead concentrates at the lower end (Kuziemko et al., 2014; Hopkins, 2018). This divergence highlights that responses to relative wealth comparisons vary considerably across individuals. Moreover, individuals differ not only in how they respond to these comparisons but also in the extent to which they engage in or value such relative comparisons at all, implying that positional concerns may not be equally salient for everyone (e.g., Clark and Senik, 2010). Recognizing and accounting for this underlying heterogeneity in risk-taking is essential, as it significantly influences the prediction of behavioral responses to concerns about relative consumption and wealth and the effectiveness of policies aimed at addressing inequality.

We present empirical evidence for this heterogeneity by investigating the psychological underpinnings of the relationship between relative wealth and risk-taking. Specifically, we draw on a concept from personality psychology that is closely intertwined with both relative comparison processes and risk-related behavior: locus of control (Rotter, 1966). This personality construct captures individuals’ beliefs about the extent to which they can influence events and outcomes in their lives. Research suggests that people who perceive outcomes as largely beyond their control tend to be especially sensitive to social comparisons, using them to reduce uncertainty and make sense of their environment (Festinger, 1954; Testa and Major, 1990; Aspinwall and Taylor, 1993; Collins, 1996; Fiske, 2011).² We use a simple framework to illustrate the dual relationship of locus of control with relative comparison and risk-taking and show that these beliefs can amplify or mute the impact of relative comparisons on risk-taking behavior. Our results clarify that average effects

¹A voluminous literature, dating back at least to Veblen (1899) and Duesenberry (1949), has accumulated evidence that people care not only about absolute outcomes but also their relative position. See for example, Frank (1985); Abel (1990); Gali (1994); Carroll et al. (2000); Ljungqvist and Uhlig (2000); Hopkins and Kornienko (2004); Luttmer (2005); Fliessbach et al. (2007); Card et al. (2012); Cohn et al. (2014); Perez-Truglia (2020); Roth (2023).

²More generally, locus of control is strongly associated with how people perceive inequality and fairness (Alesina and Angeletos, 2005; Almås et al., 2020; Fehr and Vollmann, 2025), and, like other non-cognitive skills, with life outcomes, such as educational attainment, labor market success, and life satisfaction (Coleman and DeLeire, 2003; Heckman et al., 2006; Barón and Cobb-Clark, 2010; Heckman and Kautz, 2012; Becker et al., 2012; Cobb-Clark, 2015; Caliendo et al., 2015; Pinger et al., 2018; Caliendo et al., 2022).

provide an incomplete picture of status-induced risk-taking that overlooks potentially inefficient and harmful risk-taking (e.g., over-borrowing, gambling) among certain types of people.

Several empirical challenges have hindered credible testing of the heterogeneous relationship between relative wealth and risk-taking. First, meaningfully examining the interplay between relative wealth concerns, risk-taking, and locus of control requires observations on a representative level. Second, one cannot rely on observational data, as varying levels of risk aversion are likely to result in fundamentally different wealth accumulation outcomes to begin with. Third, it is difficult, if not impossible, to create exogenous variation of ranks in the wealth distribution. We address these challenges by designing and implementing a survey module in a high-quality longitudinal study of the German population (Socio-Economic Panel – SOEP). With this module, we first measure respondents’ perceived ability to control life outcomes and then integrate respondents’ objective wealth into an experimental manipulation of relative wealth so that relative comparisons emerge naturally. We use the resulting exogenous variation in perceived relative wealth to estimate its effect on risk-taking and then examine the heterogeneous influence of perceptions of control on this relationship.

Our strategy to create the necessary exogenous variation in relative wealth is to induce a shift in respondents’ *perceived* relative standing in the wealth distribution. We take advantage of the fact that most people have to infer their relative wealth rank from their limited information on the distribution of income and wealth and systematically misestimate their rank.³ In our survey module, respondents had to state their net wealth by placing themselves into one of five wealth categories, and we randomly varied the scale of these categories. Half of the respondents received response categories with wide intervals, i.e., the lowest category ranges up to the 80th percentile of the German net wealth distribution (treatment condition), whereas the other half of respondents received response categories with small intervals, with the lowest category ranging up to the 20th percentile and the highest category starting at the 60th percentile of the German net wealth distribution (control condition). To illustrate the underlying idea, consider, for example, a group of respondents with the same objective wealth level that would place them into the 60th percentile of the wealth distribution. Respondents in the control condition would categorize themselves into the highest category, whereas respondents in the treatment condition would place themselves

³Evidence, for example for the US, suggests that individuals have limited knowledge about the wealth distribution and systematically underestimate wealth inequality (Norton and Ariely, 2011). Related, people tend to underestimate their relative income rank nationally and globally, but adjust these beliefs in response to information about their actual ranks (e.g., Cruces et al., 2013; Karadja et al., 2017; Fehr et al., 2022, 2024).

in the lowest category. Consequently, the randomization of response categories ensures that the objective income and wealth distribution is the same across treatment and control, while inducing respondents to feel that their wealth is at the lower end of the distribution and further away from the top. We view this exogenous variation in perceived relative standing as a tool to isolate changes in risk-taking that help us illustrate the theoretical linkage between relative wealth and risk-taking.

Our analysis proceeds in three steps. First, we show that the treatment affects relative wealth perceptions but not other perceptions (“first stage”). In particular, we demonstrate that treated respondents rate their wealth situation as worse relative to other households and think they rank lower in the wealth distribution than non-treated respondents (and are thus less affluent than others). Moreover, we are able to rule out alternative mechanisms through which our treatment may affect risk-taking, such as short-term fluctuations in emotions and absolute wealth perceptions. Together, this presents strong evidence that the treatment solely shifts perceptions of relative standing in the wealth distribution.

Second, we find that our treatment translates into a sizeable reduction of risk aversion, indicating that a perceived lower relative standing in the wealth distribution results in more risk-taking behavior. The likelihood of choosing a risky option instead of the safe option is 22 percent higher when respondents are induced to perceive their relative wealth as low (in line with theoretical predictions that low relative wealth triggers variation in risk-taking). This lower aversion to risk can result in a higher propensity to consume in the short run and improve one’s relative standing. To provide a more straightforward interpretation in terms of risk aversion, we then estimate individual-level utility function parameters assuming constant relative risk aversion (CRRA) as is standard in the literature. The estimated CRRA parameter ρ is about 0.5 lower among treated respondents, corresponding to a shift of 19 percent relative to the control group mean and implying less risk aversion.

Third, we delve deeper into the relationship of relative wealth and risk-taking and show that the response to the treatment is heterogeneous: it depends on respondents’ perceptions about their control over life outcomes (i.e., their locus of control). We argue that an individual’s locus of control moderates this relationship for two reasons. First, as noted above, it amplifies the response to one’s relative standing. Individuals perceiving outcomes as beyond their control – characterized by a more *external* belief system – experience greater uncertainty about how their choices will translate into future outcomes. To resolve this uncertainty, they place greater value on relative comparisons because evaluating against others provides valuable information and cues about their situation and

position in society (Festinger, 1954; Clark and Senik, 2010; Budría and Ferrer-I-Carbonell, 2019). People who believe their actions determine outcomes (i.e., who have an internal belief system), on the other hand, are less reliant on relative comparisons because they focus more on goals and behavior they can control and thus face less uncertainty about their outcomes (Clark and Senik, 2010; Budría and Ferrer-I-Carbonell, 2019). Second, relative comparisons create an incentive to improve one's relative standing, but whether this incentive translates into risk-taking depends on individuals' beliefs about the primary means of advancement. Those with an external belief system, who view outcomes as largely determined by luck or external forces, are more inclined to gamble or pursue other high-variance, low-expectation activities, as these align with their belief that success depends on chance (e.g., von der Heiden and Egloff, 2021). In contrast, individuals with an internal belief system are more likely to respond by taking more productive risks, such as investments in human capital or increased effort on the job, since they believe their actions can directly influence the outcome (e.g., Becker et al., 2005).

We use a simple theoretical framework to capture these observations by weighting absolute and relative utility depending on individuals' locus of control. By assuming that people with external beliefs assign more importance to relative consumption-utility – which implies a stronger impact of relative than absolute consumption-utility on risk aversion – the framework predicts more risk-aversion among people with external beliefs. This is because they want to preserve their relative standing. At the same time, the framework predicts that when these people perceive their relative standing as low, taking risks is more appealing because the marginal gains in relative standing from winning are now larger. That is, people who perceive outcomes as beyond their control reduce their risk aversion more than anyone else. The framework also clarifies that the observed patterns of risk-taking are a response to “perceived” changes in relative wealth instead of reflecting preference instability.

We first present direct evidence on the relationship between locus of control and interest in relative comparisons using data from the SOEP. We show that respondents displaying a more external belief system indeed show greater interest in relative comparisons. We then show that this translates into varying levels of risk-taking. In particular, we find a muted response to the treatment from respondents who perceive greater control over outcomes. They are also, in general, less risk-averse than respondents with external beliefs. In contrast, having external beliefs amplifies the response to perceived low relative wealth: respondents who are more inclined to believe that life outcomes are a matter of luck substantially increase their risk-taking behavior. The effect is

sizable, with a one standard deviation increase in external control beliefs shifting the estimated risk parameter ρ by an additional 0.9 towards less risk aversion. This suggests that people who feel left behind may view risk-taking as one of the few available strategies to improve their relative position, particularly when they believe to have little control over outcomes.

We are able to address a host of alternative explanations for this result. In particular, we find no evidence that locus of control merely picks up other facets of personal characteristics. Personality traits (Big 5, self-control, and optimism), emotions, and socio-demographic characteristics do not moderate the observed relationship. In addition, we show that the status-risk-locus-of-control nexus is a more general phenomenon. We also present evidence from the World Value Survey, showing that perceptions of lower control reinforce the negative relationship between income inequality and risk aversion.

Contribution and Related Literature. The study contributes to several strands of the literature. First, we provide field evidence on the competing predictions of the theories of status and risk-taking (see, e.g., Robson, 1996; Becker et al., 2005; Ray and Robson, 2012; Kuziemko et al., 2014; Hopkins, 2018).⁴ Common to these and other models of status concerns and risk-taking is that they only consider objective status and implicitly assume that people know their position in the wealth distribution. In contrast, the causal mechanism in our setting works through perceived relative standing in the wealth distribution. Therefore, the effects we observe are more general than those proposed by the models: more risk-taking can take place along a large part of the distribution as long as people perceive their relative standing as low. The attractiveness of risk-taking in this case is, however, not uniform; it depends on respondents' disposition about their control over life outcomes, which may explain why we might see mixed evidence on who takes risks under inequality. Consequently, "one-size-fits-all" models provide an incomplete characterization of the relationship between relative wealth and risk-taking, and incorporating personality constructs into economic analysis can provide valuable insights in explaining heterogeneity in risk preferences (Borghans et al., 2008). From a practical perspective, our findings are important because stakeholders – such as lobbyists, political parties, and policymakers – often try to shape people's views about their position in society (for example, how rich or poor they feel compared to others) to gain support for certain policies. Our results show that changing the way these policies are discussed publicly may

⁴The study also relates to a growing literature on aspirations (see La Ferrara 2019, and Genicot and Ray 2020, for reviews). Aspirations are relative in nature, as comparisons to others significantly inform individual desires and goals. In this sense, aspirations and reference points may encourage risk-taking (Ray and Robson, 2012; Genicot and Ray, 2020; Dohmen et al., 2021; Alaoui and Penta, 2025; Pickard et al., 2023).

significantly influence how people make economic decisions. At the same time, identifying who is most prone to respond to status concerns with higher risk-taking can help design better policies.

On the empirical side, there are a handful of studies on social comparison and risk-taking in small-scale laboratory and lab-in-the-field settings (Kuziemko et al., 2014; Fafchamps et al., 2015; Dijk, 2017; Gamba et al., 2017; Kirchler et al., 2018; Schwerter, 2023). These experiments typically let subjects make risky decisions involving their lab endowment and randomly vary whether the earnings of other subjects or one's relative ranking are observed or not. While this stimulates social comparisons, it tightly links the nature of the social comparison to the outcomes of the risk elicitation task.

Our research advances beyond this existing literature on social comparisons by providing evidence from naturally emerging social comparisons in a large representative sample. We can strictly separate the risk task from manipulating perceived relative standing by embedding our treatment into a simple question about background household wealth and thus avoid the reliance on randomly assigned income rank or forced comparisons.⁵ This enhances our understanding of the importance of status concerns in a real-world setting where such concerns emerge organically and likely vary in strength depending on individual-specific beliefs.

The latter issue ties into recent efforts to incorporate personality traits into economic analysis with greater rigor (Borghans et al., 2008; Almlund et al., 2011; Becker et al., 2012; Heckman et al., 2021; Jagelka, forthcoming). Most of this emerging literature focuses on personality traits such as the Big 5, while LoC has received comparatively less attention despite its strong association with important life outcomes (see e.g., Coleman and DeLeire, 2003; Heckman et al., 2006; Barón and Cobb-Clark, 2010; Heckman and Kautz, 2012; Becker et al., 2012; Cobb-Clark, 2015; Caliendo et al., 2015; Pinger et al., 2018; Caliendo et al., 2022). We focus on the relevance of LoC in influencing the strength of relative comparisons, and the observed heterogeneity in this strength highlights how psychological primitives can have a bearing on risk preferences.

More broadly, our study contributes to a growing literature on the origins of risk preferences. This literature has, for example, focused on the lasting effects of aperiodic personal experiences such as natural disasters (e.g., Eckel et al., 2009; Cameron and Shah, 2015; Hanaoka et al., 2018), macroeconomic crises (e.g., Malmendier and Nagel, 2011; Cohn et al., 2015) or violence (e.g., Voors et al., 2012; Callen et al., 2014; Jakiela and Ozier, 2019; Brown et al., 2019) on risk preferences. A

⁵In this way, our experimental design is related to Haisley et al. (2008). They studied a small sample of low-income people at a Greyhound Bus Station and found that they are more inclined to buy lottery tickets if they are primed to think that their relative income is low.

few other studies investigate short-term fluctuations in attitudes towards risk that are triggered by reoccurring economic and psychological phenomena such as day-to-day income fluctuations (Akesaka et al., 2023) and emotions (Meier, 2022).⁶ Our study places in between these two lines of research. We complement the literature on violence, crisis, and disaster by explicitly focusing on the impact of a more familiar and natural experience, namely the relative position of individuals in the economic hierarchy of society. To the extent that relative comparisons are frequent, their impact on choices is less transient than, for example, the impact of emotional states.

2 Research Design

We run our study in the German Socio-Economic Panel (SOEP), a nationally representative longitudinal study of German households (see Goebel et al., 2018, for more details). The SOEP includes an Innovation Sample (SOEP-IS) comprising several independent and representative samples. Researchers can propose their own modules in one or more of these samples. Participating households in the SOEP-IS are surveyed yearly, and all household members above age 16 are interviewed in computer-assisted face-to-face interviews by professional interviewers. This has unique advantages over other frequently used survey modes (e.g., phone and online surveys). First, we have very tight control over who is answering the questions. Second, we can minimize non-responses and clarify misunderstandings on the spot. Third, we can prevent information look-up and communication within households (for more detailed information, see Richter and Schupp, 2015).

2.1 Design of the Survey Module and Measures

We implemented a tailor-made survey module in the 2017 wave of the SOEP-IS. When we started designing the experiment in 2016, pre-registration was not widely adopted outside of development economics (for example, in the AEA RCT Registry, less than 10 percent of all registered RCTs were registered before 07/2016).⁷ It is, however, important to note that we explicitly designed the survey module to investigate average and heterogeneous treatment effects, as discussed below, and that the sample size was pre-determined by the existing panel structure of the SOEP. Our tailor-made survey module consists of three parts: questions on locus of control, treatment manipulation, and

⁶See Chuang and Schechter (2015) and Schildberg-Hörisch (2018) for a recent review of the literature on variation in (risk) preferences over time.

⁷See registrations in the AEA RCT Registry: <https://doi.org/10.7910/DVN/6TKEJR>. We registered the study ex-post for research transparency as encouraged by the American Economic Association (AEARCTR-0007444).

an incentivized lottery task to measure risk-taking (see the Appendix for the full details of the survey module).

Locus of Control. In the first part of our survey module, we elicit our personality construct of interest, locus of control (LoC), which expresses the extent to which someone believes that life events are under their control (Rotter, 1966). LoC forms early in life and has a significant degree of short- and medium-term stability (Cobb-Clark and Schurer, 2013; Fitzenberger et al., 2021). We implemented the same ten routinely used items in the SOEP (Nolte et al., 1997). For each item, respondents had to agree or disagree with statements such as “*the course of my life is depending on me*” and “*which opportunities I have in life is determined by social conditions*”, using a Likert-scale ranging from 1 (disagree completely) to 7 (agree completely).⁸ Because greater perceived control is typically associated with a more optimistic outlook, we will control for optimism (Lerner and Keltner, 2001). We measure optimism with two questions: a general question about optimism regarding the future (on a 4-point scale) taken from the SOEP and a question about the likelihood of experiencing specific events, such as financial gains, career success, or illness, relative to an average person (on a 7-point scale). Following prior studies (Specht et al., 2013; Cobb-Clark and Schurer, 2013), we use the unweighted average of seven of the ten items of our LoC measure as a single index for LoC beliefs. Each item is coded such that higher values correspond to a more external LoC. It is important to note that LoC is a continuum and that the overwhelming majority of respondents fall between the two extremes (see Figure A1 for the distribution of LoC).

Treatment Manipulation. The second part contains our treatment manipulation. We aim to induce variation in the perceived relative standing in the wealth distribution by asking respondents about their net wealth and varying the response scale of the question. This manipulation builds on research showing that response scales inevitably carry information about the population distribution. In particular, psychological and survey research suggests that respondents use their location on the scale to determine their place in the distribution (e.g., Schwarz et al., 1985; Rockwood et al., 1997; Menon et al., 1997; Bertrand and Mullainathan, 2001).

We explain the concept of net wealth and ask respondents to indicate their net wealth using five predefined wealth categories. We randomly vary the range of available response categories (see Table 1). Half of the respondents receive categories with wide intervals (treatment condition),

⁸For an overview over the wording of each item and the construction of the LoC scale, see Table A1.

i.e., *less than €275,000; €275,001 to €468,000; €468,001 to €722,000; €722,001 to €989,000; more than €989,000*. The other half of respondents are assigned to the control condition with much smaller intervals, i.e., *less than €2,500; €2,501 to €11,000; €11,001 to €27,000; €27,001 to €112,000; more than €112,000*. We constructed the intervals based on the most recent data on the German wealth distribution at the time of the survey.⁹ The lowest interval in the treatment condition covers 80 percent of the German net wealth distribution, implying that most respondents should locate themselves at the lower end of the wealth distribution. In contrast, the responses in the control condition should be more concentrated in the middle and top categories.

Risk-Elicitation Task. After the wealth categorization, we measure respondents' risk preferences through a single choice from a set of six lotteries (Binswanger, 1980; Eckel and Grossman, 2002). Each lottery from this set has an equal chance of yielding a low or a high payoff. While the first lottery guarantees respondents a payoff of €50, the remaining lotteries gradually decrease the low payoff and increase the high payoff (see Table A2). The lotteries gradually increase in expected value but also in the implicit level of risk (standard deviation). This choice task is easy to understand and, therefore, well suited for eliciting risk preferences in a general population sample (Dave et al., 2010; Charness et al., 2013), yet still rich enough to obtain detailed utility information.¹⁰ We incentivized the task by randomly selecting one in ten respondents and paying them the outcome of their chosen lottery.

Discussion of the Design. Our design induces an exogenous shift in perceived relative standing in the wealth distribution to identify the causal link from relative wealth to risk-taking. This setup ensures that, by design, the actual distribution of income and wealth is identical across treatment and control groups, effectively holding absolute wealth constant. The resulting changes in perceptions and behavior are typically short-lived, which is common in this type of intervention (e.g., Cavallo et al., 2017; Bottan and Perez-Truglia, 2022).¹¹ Since the theoretical models predict that changes in relative wealth lead to changes in risk-taking – rather than persistent changes in risk

⁹The upper bounds of the intervals correspond to the 20th, 30th, 40th, and 60th percentile of the distribution in the control condition and the 80th, 90th, 95th, and 97th percentile in the treatment condition. The median net wealth in 2014 was 60,400 euros, while the average was 214,500 (see HFCS, Deutsche Bundesbank, 2016, for more information).

¹⁰A comprehension check after the risk elicitation task revealed that about 89 percent of respondents rated the comprehensibility of the risk-elicitation task as good or very good, and only 2 percent of respondents as insufficient or unintelligible.

¹¹The pass-through rate of information on beliefs is typically substantially lower than the Bayesian benchmark and fades out within a short time frame. Given that effect sizes of behavior are usually smaller than effect sizes on belief updating, we do not expect that changes in risk-taking are permanent (see Haaland et al., 2023, for a review).

preferences – this type of intervention is sufficient for our primary objective to isolate the causal impact of relative wealth on risk-taking behavior.

Importantly, in our design, respondents receive information about the wealth distribution in the control *and* treatment groups. This has several advantages over an alternative standard design that would elicit prior beliefs about wealth ranks and then inform a random subset of respondents about their true rank to “correct” their prior beliefs. In these designs, the direction of the treatment effect is endogenous to respondents’ priors. First, in contrast to such designs, our manipulation induces a monotonic shift in perceptions within the treatment group, affecting a large portion of the sample uniformly. Second, the treatment variation in perceptions comes from differences in the information about the wealth distribution instead of exogenous changes in prior beliefs. Third, and relatedly, the treatment variation is orthogonal to prior perceptions about relative wealth and other unobserved and observed individual characteristics. This is important for analyzing heterogeneity in LoC as perceived relative wealth may depend on individual characteristics (such as LoC). To analyze this heterogeneity, we elicited LoC before the treatment intervention. This avoids running the risk that imbalances in LoC drive the results and rules out the possibility that the treatment influences responses to the LoC questions.

2.2 Data

Main Sample. Our sample in the SOEP-IS consisted of 1,115 individuals (Sample I3). Because our study requires that respondents participate in the risk-preference elicitation task, and they could refuse to do so, we include only respondents with non-missing observations, resulting in 914 observations. Importantly, missing observations are not more likely to appear in either of the two treatment conditions (17 percent in the control and 20 percent in the treatment condition, t-test, $p=0.20$).¹² In Section 4.4, we provide further evidence that there is no differential selection into the risk elicitation task and that our results are robust to re-weighting the study sample to match the socio-economic characteristics of the entire sample.

Covariates. We consider a set of observables that have been shown to relate to risk aversion, including age, gender, education, parent’s education, marital status, household size, employment status, satisfaction with health and life, region (East/West Germany), income, and wealth (see

¹² Respondents could not condition their participation on the lottery stakes because they only received some general explanation of the elicitation task before they had to indicate their participation decision.

Dohmen et al., 2011). To measure a respondent’s objective wealth, we use household information on assets and housing to estimate household wealth, following Fuchs-Schündeln and Schündeln (2005). As a proxy for wealth, we also consider homeownership, which is the most important component of wealth in Germany below the top 1% of the wealth distribution (Schröder et al., 2020). Finally, we also control for baseline risk aversion using a qualitative measure of general risk aversion measured on a scale from 0 to 10 (very willing to not willing to take risks) before the treatment.

Balance. In Table A3, we present p-values from a set of linear regressions assessing the balance of observables by treatment status. The results of these regressions (including an F-test for joint significance of all variables) indicate that the treatment and control groups are very similar along these observables. Nevertheless, we will show all empirical results with and without covariates. Finally, in Table A4, we present the same exercise for LoC and other personality traits. Again, the table indicates that these traits are well-balanced across the treatment and control groups.

Manipulation Check. We rely on two instruments to illustrate through which channel our intervention affects risk-taking: a question in the SOEP-IS and a comprehensive manipulation check in a different study sample. For this manipulation check, we recruited a new sample ($N = 987$) through respondi, an internationally well-known panel provider, and implemented a short survey (median duration of six minutes) with the exact same treatment intervention (see Section A.1 for more implementation details). We then measured the impact of the treatment on the perceived rank in the wealth distribution, the perceived median and top-10% wealth levels, LoC, positive and negative affective states, and credibility of the wealth data. The separate manipulation check allows us to conduct a comprehensive manipulation check without running the risk of contaminating the outcomes through the first stage or the first stage through the outcomes or manipulation.

3 First Stage Results

As a first pass to check if the manipulation worked as intended, we look at the responses to the wealth categorization in both conditions in Table 1. In the control condition, the distribution of responses in the five wealth categories is well dispersed, and a majority of respondents aligned themselves in one of the three top categories starting from €11,000. In strong contrast, about 80 percent of respondents in the treatment condition placed themselves in the lowest category. The

categorizations also reflect the absolute wealth of respondents that we estimated from household information on assets and housing in the SOEP-IS. For example, the average net wealth in the lowest treatment category (ranging to the 80th percentile) is about €127,000, comparable to the average wealth of €126,000 in the four lowest control categories that range up to the 60th percentile. Similarly, the average wealth in the highest control category is close to the level in the four highest treatment categories (€427,000 vs. €370,000).¹³ Accordingly, the wider wealth intervals of the treatment condition induced most respondents to locate themselves at the lower end of the wealth distribution, and the manipulation is unlikely to affect perceptions of absolute wealth.

Next, we examine whether the manipulation induced a feeling of low relative wealth and being further away from the top. In Table 2, we demonstrate that the treatment affects how respondents compare their net wealth to other households. First, we see that treated respondents perceive their wealth situation as worse relative to other households than non-treated respondents (column 1).¹⁴ We quantify this assessment by directly asking respondents about their position in the wealth distribution. Column 2 shows that treated respondents rank themselves lower in the wealth distribution than non-treated respondents and thus perceive themselves as less wealthy. Second, we show that the treatment does not influence how respondents perceive the absolute wealth level (i.e., the median net wealth). Columns (3) in Table 2 indicate that treated respondents have a higher estimate of the median wealth than non-treated respondents, but the difference is insignificant, indicating that the presenting higher wealth percentiles in the treatment condition do not affect perceived absolute wealth. Third, we ask respondents in our SOEP-IS sample to estimate the household income above which they are richer than 90 percent of other households.¹⁵ Given the positive correlation between wealth and income, we should also see a qualitative effect on this relative income estimate if the treatment successfully induced a perception of lower relative standing. That is, inferring the 90th income percentile based on one's own income should result in higher estimates in the treatment condition. Column (5) of Table 2 confirms this hypothesis and indicates a strong effect: treated respondents estimate a 29 percent higher income at the 90th percentile of the household income distribution than untreated respondents, indicating a lower relative standing and a larger gap to the top. Together, these findings further illustrate that the

¹³We see a similar pattern if we look at homeownership as a proxy for wealth, which is not surprising given the strong correlation between wealth and homeownership ($\rho = 0.58$).

¹⁴Only about 78 percent of treated respondents say their wealth situation is the same as or worse than the situation of other households (compared to 69 percent in the control condition, t-test, $p < 0.01$).

¹⁵We placed this question in a subsequent and unrelated survey module and focused on income to obfuscate the link between our treatment and the manipulation check. Douenne et al. (2024) present evidence that people infer their wealth rank from their income rank and vice versa.

intervention affects relative wealth perceptions but not absolute wealth perceptions.

In addition, we can rule out other channels through which the intervention may influence risk-taking. First, we show that respondents find the presentation of wealth categories credible in both treatment and control groups. We see virtually no difference in the credibility rating of the presented wealth data (see Table A6, column 1). Second, we test whether the treatment has a bearing on respondents' LoC. We find no evidence for such an effect: treated respondents display a similar level of LoC as respondents in the control group (Table A6, column 2). Finally, we address a concern that the treatment induces a temporary change in emotional states, for example, because one learns that one's wealth is at the lower end of the distribution. We examine the impact of our treatment on two different positive and negative affective states – self-esteem and mood – and on limitations due to emotional problems. We find no indication that the feeling of low relative standing results in changes in these affective states and limitations (Table A6, columns 3–5).

In summary, we take these results as evidence that exposing respondents to wider wealth intervals in the treatment condition generated a very strong “first stage” and had the intended effect of significantly shifting respondents' views about whether their relative standing in the wealth distribution is low or not.

4 Main Results

4.1 Estimation Strategy

We now analyze how perceived relative standing in the wealth distribution impacts respondents' willingness to take risks. The incentivized lottery task allows us to estimate preference parameters under reasonable assumptions. It is common in the literature to assume that people view the financial gains of these incentivized lotteries in isolation and do not integrate their background wealth when making their choice (e.g., Andersen et al., 2008), since otherwise, their choices in small-stakes lotteries would imply implausible levels of risk-aversion (Rabin, 2000). Theoretically, we can rationalize this assumption by separating short-term consumption budgets from background wealth in a dual-self model, in which agents evaluate (lottery) choices relative to short-term consumption and not wealth (Fudenberg and Levine, 2006). Although the stakes in our incentivized lottery task can make a difference in relative wealth, especially at the lower end of the distribution, we follow the conventional approach and think of the lottery choices as informative of relative consumption in the short term.

Following the standard practice in the literature, we assume that individuals are expected utility maximizers who exhibit constant relative risk aversion (CRRA) (e.g., Binswanger, 1980; Andersen et al., 2008; Brunnermeier and Nagel, 2008; Chiappori and Paiella, 2011; Sahm, 2012; Carvalho et al., 2016a).¹⁶ The utility of a monetary amount x is then given by $u(x) = x^{1-\rho} \times (1 - \rho)^{-1}$, where ρ is the coefficient of relative risk aversion, with higher values corresponding to greater risk aversion. We calculate lower and upper bounds for the CRRA parameter ρ for each lottery as explained and displayed in Table A2. The parameters range from extreme risk aversion ($\rho > 7.51$) to risk-neutral (loving) ($\rho \leq 0$). We then model the unobserved risk preference parameters as a latent variable that is linear in its covariates:

$$CRRA_i^* = \tau \times Treatment_i + \beta_1 \times BaselineRisk + \mathbf{X}_i' \beta_2 + \epsilon_i, \quad (1)$$

where *Treatment* is an indicator for being induced to think that one's own wealth is at the lower end of the wealth distribution, *Baseline Risk* is a qualitative risk measure elicited prior to the treatment, and \mathbf{X} includes a constant term and our standard set of socio-demographic variables, as outlined in Section 2.2 (see also Table A3).

Assuming $\epsilon \sim \mathcal{N}(0, \sigma_\epsilon^2)$, we can use the mapping of observed lottery choices into theoretical intervals of CRRA values to estimate the parameters of model (1) by maximum-likelihood. For example, the choice of lottery 3 is consistent with a CRRA parameter on the interval $[0.821, 1.74]$. The likelihood contribution of an individual i choosing lottery 3 is consequently the probability that their CRRA parameter ρ falls within this interval, i.e., $Pr(0.821 \leq CRRA_i^* < 1.74)$. Note that this estimation procedure is tightly linked to an ordered probit model. The difference lies only in the fact that we construct the intervals for the latent variable, $CRRA_i^*$, based on economic theory, whereas in an ordered probit model, we would additionally need to estimate these boundaries. Below, we also present evidence that our results do not depend on this specific functional form of utility or estimation strategy.

4.2 Average Treatment Effect

Descriptives. In a first step, we present correlates of risk preferences with socio-demographic variables, using control group observations only. Figure A2 shows coefficient plots of estimating

¹⁶Using panel data, Chiappori and Paiella (2011) present empirical evidence that portfolio choices across the distribution of household wealth are well described by constant relative risk aversion (see also Brunnermeier and Nagel, 2008; Sahm, 2012).

the parameters of model (1) for the control group. In line with most of the literature, we find that females are more risk-averse and that better-educated respondents are less risk-averse (e.g., Barsky et al., 1997; Dohmen et al., 2011; Chapman et al., 2018). We also find that married and unemployed respondents are more risk-averse, while higher income, having better-educated fathers, and higher health satisfaction are associated with less risk aversion.

Next, we relate our incentivized measure of risk preferences to the qualitative baseline risk measure. Prior research indicates that this qualitative measure correlates strongly with an experimentally elicited risk measure and predicts risk-taking in several life domains (Dohmen et al., 2011). Our control group data affirm this relationship as well. We see a strong correlation between our incentivized risk measure (which differs from the validation instrument in the previous literature) and baseline risk. A one standard deviation increase in the qualitative risk measure is related to a 0.57 higher CRRA parameter ρ (see Table A5, column 3). Table A5 also shows qualitatively similar results if we relate these socio-demographics to lottery choices instead of the relative risk aversion parameter.

Non-parametric Analysis. Before we turn to the estimation of (1) for the treatment and control group, we take a non-parametric approach to look at the effect of perceived relative wealth on risk-taking. Using the raw lottery choices, we show that respondents in the treatment group have a 22 percent lower propensity to choose the safe lottery, offering a sure payoff of 50€, than respondents in the control group ($p = 0.041$, Table A7).¹⁷ This suggests that a perceived low relative standing increases the willingness to gamble: the treatment induces respondents to demand a higher certain payoff to forgo riskier lotteries, and therefore, we observe more gambling. In the next step, we quantify this greater willingness to take risks.

Structural Analysis. We now present the results from estimating (1) for the treatment and control group in Table 3. Column (1) includes a treatment indicator, baseline risk attitudes, and a constant, whereas column (2) also adjusts for our set of covariates. In line with the non-parametric effect, the treatment effect is negative, indicating a decrease in risk aversion. Unsurprisingly, given the random assignment, the estimated effect is similar in both cases. The estimates point to a reduction in the measured CRRA parameter of roughly 0.53-0.56. Compared to the control group mean of

¹⁷Figure A3 illustrates this shift by showing the distribution of lottery choices separated by the two conditions.

2.86, this amounts to a change of about 19 percent.¹⁸ Together with the non-parametric analysis, this is evidence of less risk aversion if respondents perceive themselves to be at the lower end of the wealth distribution.

To put the result into perspective, we compare our estimates to other studies. For example, Carvalho et al. (2016b) estimate that a random assignment to savings accounts for rural Nepalese households leads to a 17 percent increase in risky choices in a similar lottery task. Other studies estimate gender differences in CRRA parameters of 30 percent (e.g., Garbarino et al., 2011). Given these numbers, the average treatment effect presented above appears sizable. At the same time, we must keep in mind that the average predicted CRRA parameter in both the treatment and control groups is well above zero and thus consistent with risk aversion. While the treatment shifts the level considerably, it reduces the aversion to risk and does not lead to risk neutrality or even risk-loving behavior.

4.3 Moderating the Effect: Relative Wealth and Perceptions of Control

We now turn to our second contribution and examine how the response to relative comparisons varies with respondents' beliefs about the underlying structural causes of relative wealth. As indicated earlier, psychological research suggests that a feeling of little control over life outcomes (external LoC) is associated with a higher tendency to engage in relative comparisons. Figure 1 illustrates this relationship using data from the SOEP-IS. The figure confirms that the inclination to compare oneself to others increases with more external control beliefs.¹⁹ People with external control beliefs may compare themselves to others more often because they seek to reduce social uncertainty and boost their well-being and self-esteem. These comparisons may bring them greater utility gains than those with internal control beliefs. (Wills, 1981; Wood and Taylor, 1991; Clark and Senik, 2010; Budría and Ferrer-I-Carbonell, 2019).²⁰

We develop a simple framework that illustrates the dual relationship of locus of control with relative comparisons and risk-taking (see Section A.2 for details). In the model, we consider

¹⁸Figure A4 illustrates the result from column (2) of Table 3 using the predicted CRRA parameters. It shows a sizeable shift of the predicted CRRA parameter ρ towards lower values in the treatment condition, meaning less risk aversion.

¹⁹We draw here on the Social Comparison Scale that measures an individual's disposition towards making social comparisons. This scale is part of a different and independent SOEP-IS sample ($N = 1,388$), and thus, we cannot link the scale directly to our respondents (see notes of Figure 1 for more detail).

²⁰Consistent with the idea that favorable relative comparisons boost self-perceptions and that the utility gains of such comparisons are larger for people at the lower end than at the top of the distribution, Figure A5 shows a strong and positive correlation between perceived wealth rank and self-esteem and a negative relationship with income adequacy (i.e., a higher rank translates into less need for money).

an individual who cares about both absolute consumption and relative consumption. They weigh the two components depending on the strength of their locus of control. Assuming that individuals with external beliefs place greater weight on relative rather than absolute consumption utility, the framework predicts higher baseline risk aversion among them – motivated by a desire to preserve their relative standing. However, when these individuals perceive their relative standing as low (as induced by our treatment), taking risks becomes more attractive, as the potential gains in status are larger. In other words, those who see outcomes as beyond their control respond more strongly to downward shifts in relative wealth by reducing their risk aversion more than others.

Descriptives. The median LoC score in our sample is 3 (average: 3.13, see Figure A1 for the distribution of LoC). The distribution of LoC indicates that the majority of respondents have internal control beliefs, which confirms previous findings from the SOEP (e.g., Nolte et al., 1997). In Table A5 (columns 5–6) and Figure A2, we present correlates of LoC based on control group data. Consistent with existing empirical evidence, we see an education and income gradient, i.e., more education and higher income are associated with lower external control beliefs.

Regression Analysis. In Table 3, we present regression results on these heterogeneous effects using the following specification for the latent curvature parameter of the CRRA utility:

$$CRRA_i^* = \tau * Treatment_i + \delta * LoC_i + \gamma * Treatment_i \times LoC_i + \mathbf{X}_i' \boldsymbol{\beta} + \epsilon_i. \quad (2)$$

Note that regression specification (2) includes a standardized and continuous measure of control beliefs, LoC_i . The main coefficient of interest, γ , can therefore be interpreted as the additional effect of our treatment for an individual with a one standard deviation higher LoC score.

The results are displayed in column (3) of Table 3.²¹ First, we observe that the treatment effect does not change when adjusting for heterogeneity in LoC. Second, there is a positive relationship between LoC and risk-taking, confirming the commonly observed pattern in the literature that respondents with an external LoC exhibit higher risk aversion than respondents with an internal LoC. However, the treatment weakens this relationship: respondents with a higher LoC score, indicating more external beliefs, display a stronger treatment effect, i.e., towards a lower estimated CRRA parameter ($p < 0.001$). Adjusting for basic sociodemographic characteristics has virtually no

²¹The results are robust to using the midpoint of the CRRA intervals and estimating a linear regression model (see Table A8). While this alternative approach is less demanding in terms of distributional assumptions than an interval regression, it does not account for censoring and does not reflect uncertainty about the exact value in the interval.

effect on the coefficient estimate of the interaction term (column 4). Moreover, the result is robust to controlling for the *false discovery rate* (FDR).²²

The magnitude of the effect is sizable: a one standard deviation shift towards more external beliefs leads to a difference in the corresponding treatment effect that is almost twice the size of the average treatment effect (Table 3, column 1). Put differently, for an individual with a 0.5 standard deviation higher LOC score, the treatment shifts the CRRA parameter downwards by almost 1. In terms of model calibration, this is equal to a difference between a relative risk aversion parameter $\rho = 2$ and log-utility.

4.4 Robustness

Next, we describe a battery of exercises to probe the robustness of our results. These exercises address concerns about internal validity and include alternative specifications of LoC. Importantly, we provide evidence that other personality traits are unlikely to moderate the effect on risk-taking. Finally, we illustrate the broader relevance of the observed heterogeneous relationship.

Non-Compliance. Recall that participation in the risk-elicitation task was voluntary. Consequently, a potentially worrisome threat to internal validity is differential selection into the risk-preference elicitation task. We address this issue in several ways. First, we note that the sample is balanced on a set of important observables, including baseline risk aversion (see Table A3). Therefore, it is unlikely that the main effects are driven by differential selection with respect to pre-treatment risk aversion. Second, in Table A9, we provide further evidence that non-participation in the risk-elicitation task is orthogonal to the randomly assigned treatment status. In particular, we show that non-participation in the risk-elicitation task does not differ across conditions (panel a.) and that baseline risk aversion is the same across respondents and non-respondents (panel b.) and treatment and control (panel c.). Third, we show that our results are robust to re-weighting the study sample to match the socio-economic characteristics of the full sample. That is, we use a probit regression to predict the sampling probability of each respondent with a set of observable characteristics and use the inverse of this probability to construct individual weights. Table A10 reveals that this re-weighting exercise yields very similar results as our unweighted estimates. Taken together, there is little reason to worry that the decision to participate in the lottery task

²²In Section 4.4, we test the robustness of the moderating effect of LoC using an array of alternative factors that may drive the relationship. Therefore, we address potential concerns about multiple-hypothesis testing using the two-stage linear step-up procedure by Benjamini et al. (2006) that controls for the *false discovery rate* (see Section A.4).

biases our estimates.

Alternative LoC Scores. As is common in the literature, we use a single index for LoC in our analysis. However, a concern is that this index is based on unweighted averages (Cobb-Clark and Schurer, 2013). We present two alternative measures for LoC to show the robustness of our results. First, we perform a principal component analysis to extract a separate score for internal and external control beliefs (see e.g., Pinger et al., 2018). We then interact each of the two scores with our treatment indicator. Second, we interact the treatment with a median split of our single-index LoC measure. In Table A11, we show that the choice of how to represent individual LoC beliefs does not affect our conclusions in a meaningful way.

Other Personality Traits. A widespread concern is that LoC merely captures the effects of other facets of personality, such as the Big 5, optimism, or self-control. For instance, Judge et al. (2002) consider the LoC as part of a higher-level construct that is intermeshed with other traits such as neuroticism. Similarly, evidence suggests that optimism is related to LoC and risk aversion (Lerner and Keltner, 2001; Dohmen et al., 2018). We explore these concerns along two margins. First, we re-estimate regression (2) and additionally include the Big 5, our optimism proxy, and a self-control score as well as their interactions with the treatment (Table A12, columns 3-6).²³ This reduces somewhat the magnitude of the statistical association between LoC and our risk measure, but it does not affect the coefficient estimates of interest: the treatment and interaction effect. This is also true if we condition on all other personality traits at the same time (Table A12, column 6). Second, in Table A13, we additionally show that none of the alternative traits are stand-ins for LoC by fitting models that interact our treatment with each component of the Big 5, optimism, and self-control separately. In contrast to LoC, none of the interactions between these other personality traits are statistically distinguishable from zero, which is reassuring evidence that the treatment effect we observe is moderated by LoC and not by other personality traits.

²³The optimism proxy we use here is based on the following question that we administered before the LoC questions: "If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?". The conclusions do not change if we instead use a measure for optimism relative to one's peer group. Note that Dohmen et al. (2018) use a different optimism measure based on self-reported degrees of optimism and pessimism. The self-control score is based on a 13-item module following Tangney et al. (2004) that was administered by an independent study on the same sample (Cobb-Clark et al., 2019). We recode each item such that higher values are indicative of a stronger sense of self-control. Subsequently, we standardized their sum using the sample mean and standard deviation.

Emotions. There is some evidence that risk-taking and LoC are tightly linked to emotions (e.g., Loewenstein et al., 2001; Cohn et al., 2015; Meier, 2022). To investigate the potential role of emotions in moderating the treatment effect, we follow the same approach as in our analysis of personality traits above. In Table A14, we re-estimate regression (2) and control for anger, fear, and a combined measure of happiness and sadness.²⁴ Again, we basically see that our main result is robust to controlling for emotions. Next, we interact each emotion with our treatment and report the results in Table A15. We find no indication of heterogeneity in our results that are related to emotions. Moreover, the analysis of the manipulation check in Section 3 revealed no evidence for an effect of the treatment on the affective states of respondents. Together, this suggests that emotions play little role in our context: neither as moderators nor as an alternative channel of the treatment.

Other Socio-Economic Characteristics. To explore whether the heterogeneous effects of LoC just pick up heterogeneity in some socio-economic characteristics, we rerun our specification (2) with socio-economic characteristics that are associated with LoC, such as unemployment status, income, and education. Differentiating respondents along these categories also reveals substantial differences in their tolerance of risk. This is, for example, true for gender: women are more risk averse than men.²⁵ However, we find no evidence that any of these socio-economic characteristics interact with the treatment, suggesting that LoC affects heterogeneity independent of these characteristics (Table A16).

Inequality. We provide evidence that our findings extend beyond our context. Relative position in the wealth (and income) distribution is naturally linked to inequality because the distribution affects how much richer others are. At the aggregate level, this notion of relative deprivation is related to the Gini coefficient (Yitzhaki, 1979; Hey and Lambert, 1980). Using data from the World Value Survey, we show that greater income inequality is linked to lower risk aversion and that external control beliefs moderate this relationship (see Section A.3 for more details).

²⁴The SOEP-IS routinely asks how often respondents experienced anger, fear, happiness, and sadness in the four weeks prior to the interview. Following the literature, we combine happiness and sadness in an index by taking the average of their difference and adjusting the index to be in the same range as the other emotions (see Meier, 2022).

²⁵The sample gender difference in the implicit CRRA parameter is roughly 33%, and the unemployed/employed contrast is 29%. Both magnitudes lie well above the difference observed for LoC.

5 Conclusion

We have presented evidence for the causal link between relative wealth and risk-taking. People are less risk-averse if they perceive their relative standing in the wealth distribution as low. This effect is particularly strong among people who tend to believe that life outcomes are more likely beyond their control.

These results highlight the importance of identifying when *and for whom* relative wealth matters for risk-taking. First, they help to refine predictions about risk-taking in response to relative comparisons. This is particularly important when status-seeking behavior can lead to inefficient or harmful risk-taking. In fact, by incorporating locus of control, we show that people with certain personalities, reflected in more external beliefs, are more sensitive to relative comparisons and respond with more risk-taking. Other research has shown that people with such beliefs typically have worse life outcomes, e.g., less labor market success and lower educational attainment, academic success, and life satisfaction (e.g., Coleman and DeLeire, 2003; Heckman et al., 2006; Barón and Cobb-Clark, 2010; Caliendo et al., 2015). Taking our findings at face value suggests that these people – who are disproportionately found in disadvantaged groups – are particularly prone to take unproductive risks, such as gambling and other risky activities with low average returns. This can reinforce existing inequalities and lead to worse long-term outcomes. On the other hand, those who attribute outcomes to their own efforts and often have more resources tend to engage in productive risk-taking, such as education or entrepreneurial activities (Becker et al., 2005), which can enhance both personal welfare and economic growth.

Second, recognizing this heterogeneity can help design better policies. Any policy or environmental factor that increases concerns about relative standing (for example, greater income transparency or rising inequality) could trigger divergent responses based on individuals' locus of control. Therefore, understanding the role of locus of control can guide interventions toward those most likely to engage in excessive risk when faced with low status. In short, accounting for this interaction helps policymakers anticipate who might “gamble for resurrection” in highly unequal environments and to design targeted interventions or safety nets.

Similar to most other empirical case studies, our study is not without limitations. To elicit risk preferences in an incentivized way, we necessarily had to rely on lottery choices involving moderate stakes. A natural question is, thus, how our results carry over to settings with higher stakes. Relatedly, our focus is restricted to possible relative standing improvements because it was

impossible to elicit risky choices in the negative outcome domain. Negative outcomes are, however, common, and a real-world application that addresses issues around negative outcomes and merits further study is insurance choices. While we cannot observe these choices, our focus on risk-taking helps us predict behavioral responses to relative wealth across various domains. For example, if the effect of relative comparisons on risk-taking is sufficiently symmetric around gains and losses, our results indicate that individuals might be less inclined to spend money on insurance if they are concerned about their low relative standing.

References

- ABEL, A. B. (1990): "Asset prices under habit formation and catching up with the Joneses," *American Economic Review*, 80, 38–42.
- AKESAKA, M., P. EIBICH, C. HANAOKA, AND H. SHIGEOKA (2023): "Temporal instability of risk preference among the poor: Evidence from payday cycles," *American Economic Journal: Applied Economics*, forthcoming.
- ALAOU, L. AND A. PENTA (2025): "Attitudes Towards Success and Failure," *American Economic Journal: Microeconomics*, forthcoming.
- ALESINA, A. AND G.-M. ANGELETOS (2005): "Fairness and redistribution," *American Economic Review*, 95, 960–980.
- ALMÅS, I., A. W. CAPPELEN, AND B. TUNGODDEN (2020): "Cutthroat capitalism versus cuddly socialism: Are Americans more meritocratic and efficiency-seeking than Scandinavians?" *Journal of Political Economy*, 128, 1753–1788.
- ALMLUND, M., A. L. DUCKWORTH, J. HECKMAN, AND T. KAUTZ (2011): "Personality psychology and economics," in *Handbook of the Economics of Education*, Elsevier, vol. 4, 1–181.
- ANDERSEN, S., G. W. HARRISON, M. I. LAU, AND E. E. RUTSTRÖM (2008): "Eliciting risk and time preferences," *Econometrica*, 76, 583–618.
- ASPINWALL, L. G. AND S. E. TAYLOR (1993): "Effects of social comparison direction, threat, and self-esteem on affect, self-evaluation, and expected success." *Journal of Personality and Social Psychology*, 64, 708.

- BARÓN, J. D. AND D. A. COBB-CLARK (2010): "Are young people's educational outcomes linked to their sense of control?" *IZA Discussion Paper*.
- BARSKY, R. B., F. T. JUSTER, M. S. KIMBALL, AND M. D. SHAPIRO (1997): "Preference parameters and behavioral heterogeneity: An experimental approach in the health and retirement study," *Quarterly Journal of Economics*, 112, 537–579.
- BECKER, A., T. DECKERS, T. DOHMEN, A. FALK, AND F. KOSSE (2012): "The relationship between economic preferences and psychological personality measures," *Annual Review of Economics*, 4, 453–478.
- BECKER, G. S., K. M. MURPHY, AND I. WERNING (2005): "The equilibrium distribution of income and the market for status," *Journal of Political Economy*, 113, 282–310.
- BENJAMINI, Y., A. M. KRIEGER, AND D. YEKUTIELI (2006): "Adaptive linear step-up procedures that control the false discovery rate," *Biometrika*, 93, 491–507.
- BERTRAND, M. AND S. MULLAINATHAN (2001): "Do people mean what they say? Implications for subjective survey data," *American Economic Review*, 91, 67–72.
- BINSWANGER, H. P. (1980): "Attitudes toward risk: Experimental measurement in rural India," *American Journal of Agricultural Economics*, 62, 395–407.
- BORGHANS, L., A. L. DUCKWORTH, J. J. HECKMAN, AND B. TER WEEL (2008): "The economics and psychology of personality traits," *Journal of Human Resources*, 43, 972–1059.
- BOTTAN, N. L. AND R. PEREZ-TRUGLIA (2022): "Choosing Your Pond: Location Choices and Relative Income," *Review of Economics and Statistics*, 104, 1010–1027.
- BROWN, R., V. MONTALVA, D. THOMAS, AND A. VELÁSQUEZ (2019): "Impact of violent crime on risk aversion: Evidence from the Mexican drug war," *Review of Economics and Statistics*, 101, 892–904.
- BRUNNERMEIER, M. K. AND S. NAGEL (2008): "Do wealth fluctuations generate time-varying risk aversion? Micro-evidence on individuals," *American Economic Review*, 98, 713–36.
- BUDRÍA, S. AND A. FERRER-I-CARBONELL (2019): "Life Satisfaction, Income Comparisons and Individual Traits," *Review of Income and Wealth*, 65, 337–357.

- CALIENDO, M., D. A. COBB-CLARK, C. OBST, H. SEITZ, AND A. UHLENDORFF (2022): "Locus of control and investment in training," *Journal of Human Resources*, 57, 1311–1349.
- CALIENDO, M., D. A. COBB-CLARK, AND A. UHLENDORFF (2015): "Locus of control and job search strategies," *Review of Economics and Statistics*, 97, 88–103.
- CALLEN, M., M. ISAQZADEH, J. D. LONG, AND C. SPRENGER (2014): "Violence and risk preference: Experimental evidence from Afghanistan," *American Economic Review*, 104, 123–48.
- CAMERON, L. AND M. SHAH (2015): "Risk-taking behavior in the wake of natural disasters," *Journal of Human Resources*, 50, 484–515.
- CARD, D., A. MAS, E. MORETTI, AND E. SAEZ (2012): "Inequality at work: The effect of peer salaries on job satisfaction," *American Economic Review*, 102, 2981–3003.
- CARROLL, C. D., J. OVERLAND, AND D. N. WEIL (2000): "Saving and growth with habit formation," *American Economic Review*, 90, 341–355.
- CARVALHO, L. S., S. MEIER, AND S. W. WANG (2016a): "Poverty and economic decision-making: Evidence from changes in financial resources at payday," *American Economic Review*, 106, 260–84.
- CARVALHO, L. S., S. PRINA, AND J. SYDNOR (2016b): "The effect of saving on risk attitudes and intertemporal choices," *Journal of Development Economics*, 120, 41–52.
- CAVALLO, A., G. CRUCES, AND R. PEREZ-TRUGLIA (2017): "Inflation expectations, learning, and supermarket prices: Evidence from survey experiments," *American Economic Journal: Macroeconomics*, 9, 1–35.
- CHAPMAN, J., E. SNOWBERG, S. WANG, AND C. CAMERER (2018): "Loss attitudes in the US population: Evidence from dynamically optimized sequential experimentation (DOSE)," *NBER Working Paper w25072*.
- CHARNESS, G., U. GNEEZY, AND A. IMAS (2013): "Experimental methods: Eliciting risk preferences," *Journal of Economic Behavior & Organization*, 87, 43–51.
- CHIAPPORI, P.-A. AND M. PAIELLA (2011): "Relative risk aversion is constant: Evidence from panel data," *Journal of the European Economic Association*, 9, 1021–1052.

- CHUANG, Y. AND L. SCHECHTER (2015): "Stability of experimental and survey measures of risk, time, and social preferences: A review and some new results," *Journal of Development Economics*, 117, 151–170.
- CLARK, A. E. AND C. SENIK (2010): "Who compares to whom? The anatomy of income comparisons in Europe," *Economic Journal*, 120, 573–594.
- COBB-CLARK, D. A. (2015): "Locus of control and the labor market," *IZA Journal of Labor Economics*, 4, 3.
- COBB-CLARK, D. A., S. DAHMANN, D. KAMHÖFER, AND H. SCHILDBERG-HÖRISCH (2019): "Self-control: Determinants, life outcomes and intergenerational implications," .
- COBB-CLARK, D. A. AND S. SCHURER (2013): "Two economists' musings on the stability of locus of control," *Economic Journal*, 123, F358–F400.
- COHN, A., J. ENGELMANN, E. FEHR, AND M. A. MARÉCHAL (2015): "Evidence for countercyclical risk aversion: An experiment with financial professionals," *American Economic Review*, 105, 860–85.
- COHN, A., E. FEHR, B. HERRMANN, AND F. SCHNEIDER (2014): "Social comparison and effort provision: Evidence from a field experiment," *Journal of the European Economic Association*, 12, 877–898.
- COLEMAN, M. AND T. DELEIRE (2003): "An economic model of locus of control and the human capital investment decision," *Journal of Human Resources*, 38, 701–721.
- COLLINS, R. L. (1996): "For better or worse: The impact of upward social comparison on self-evaluations," *Psychological Bulletin*, 119, 51–69.
- CRUCES, G., R. PEREZ-TRUGLIA, AND M. TETAZ (2013): "Biased perceptions of income distribution and preferences for redistribution: Evidence from a survey experiment," *Journal of Public Economics*, 98, 100–112.
- DAVE, C., C. C. ECKEL, C. A. JOHNSON, AND C. ROJAS (2010): "Eliciting risk preferences: When is simple better?" *Journal of Risk and Uncertainty*, 41, 219–243.
- DIJK, O. (2017): "For whom does social comparison induce risk-taking?" *Theory and Decision*, 82, 519–541.

- DOHMEN, T., A. FALK, D. HUFFMAN, U. SUNDE, J. SCHUPP, AND G. G. WAGNER (2011): "Individual risk attitudes: Measurement, determinants, and behavioral consequences," *Journal of the European Economic Association*, 9, 522–550.
- DOHMEN, T., A. NON, AND T. STOLP (2021): "Reference points and the tradeoff between risk and incentives," *Journal of Economic Behavior & Organization*, 192, 813–831.
- DOHMEN, T. J., S. QUERCIA, AND J. WILLRODT (2018): "Willingness to take risk: The role of risk conception and optimism," *IZA Discussion Paper No. 11642*.
- DOUENNE, T., O. SUND, AND J. J. VAN DER WEELE (2024): "Do People Distinguish Income from Wealth Inequality? Evidence from the Netherlands," CEPR Discussion Paper DP19174, Centre for Economic Policy Research.
- DUESENBERY, J. S. (1949): *Income, saving and the theory of consumer behavior*, Cambridge, MA: Harvard University Press.
- ECKEL, C. C., M. A. EL-GAMAL, AND R. K. WILSON (2009): "Risk loving after the storm: A Bayesian-Network study of Hurricane Katrina evacuees," *Journal of Economic Behavior & Organization*, 69, 110–124.
- ECKEL, C. C. AND P. J. GROSSMAN (2002): "Sex differences and statistical stereotyping in attitudes toward financial risk," *Evolution and Human Behavior*, 23, 281–295.
- FAFCHAMPS, M., B. KEBEDE, AND D. J. ZIZZO (2015): "Keep up with the winners: Experimental evidence on risk taking, asset integration, and peer effects," *European Economic Review*, 79, 59–79.
- FALK, A., A. BECKER, T. DOHMEN, B. ENKE, D. HUFFMAN, AND U. SUNDE (2018): "Global evidence on economic preferences," *Quarterly Journal of Economics*, 133, 1645–1692.
- FEHR, D., J. MOLLERSTROM, AND R. PEREZ-TRUGLIA (2022): "Your Place in the World: Relative Income and Global Inequality," *American Economic Journal: Economic Policy*, 14, 232–68.
- (2024): "Listen to Her: Gender Differences in Information Diffusion within the Household," *Journal of Public Economics*, 239, 105213.
- FEHR, D. AND M. VOLLMANN (2025): "Misperceiving economic success: Experimental evidence on meritocratic beliefs and inequality acceptance," *Journal of Economic Inequality*, forthcoming.

- FESTINGER, L. (1954): "A Theory of Social Comparison Processes," *Human Relations*, 7, 117–140.
- FISKE, S. T. (2011): *Envy up, scorn down: How status divides us*, Russell Sage Foundation.
- FITZENBERGER, B., G. MENA, J. NIMCZIK, AND U. SUNDE (2021): "Personality traits across the life cycle: Disentangling age, period and cohort effects," *Economic Journal*, 132, 2141–2172.
- FLIESSBACH, K., B. WEBER, P. TRAUTNER, T. DOHMEN, U. SUNDE, C. E. ELGER, AND A. FALK (2007): "Social comparison affects reward-related brain activity in the human ventral striatum," *Science*, 318, 1305–1308.
- FRANK, R. H. (1985): "The demand for unobservable and other nonpositional goods," *American Economic Review*, 75, 101–116.
- FRIEDMAN, M. AND L. J. SAVAGE (1948): "The utility analysis of choices involving risk," *Journal of Political Economy*, 56, 279–304.
- FUCHS-SCHÜNDELN, N. AND M. SCHÜNDELN (2005): "Precautionary savings and self-selection: evidence from the German reunification experiment," *Quarterly Journal of Economics*, 120, 1085–1120.
- FUDENBERG, D. AND D. K. LEVINE (2006): "A dual-self model of impulse control," *American Economic Review*, 96, 1449–1476.
- GALI, J. (1994): "Keeping up with the Joneses: Consumption externalities, portfolio choice, and asset prices," *Journal of Money, Credit and Banking*, 26, 1–8.
- GAMBA, A., E. MANZONI, AND L. STANCA (2017): "Social comparison and risk taking behavior," *Theory and Decision*, 82, 221–248.
- GARBARINO, E., R. SLONIM, AND J. SYDNOR (2011): "Digit ratios (2D: 4D) as predictors of risky decision making for both sexes," *Journal of Risk and Uncertainty*, 42, 1–26.
- GENICOT, G. AND D. RAY (2020): "Aspirations and economic behavior," *Annual Review of Economics*, 12, 715–746.
- GOEBEL, J., M. M. GRABKA, S. LIEBIG, M. KROH, D. RICHTER, C. SCHRÖDER, AND J. SCHUPP (2018): "The German Socio-Economic Panel (SOEP)," *Jahrbücher für Nationalökonomie und Statistik*.

- HAALAND, I., C. ROTH, AND J. WOHLFART (2023): "Designing information provision experiments," *Journal of Economic Literature*, 61, 3–40.
- HAISLEY, E., R. MOSTAFA, AND G. LOEWENSTEIN (2008): "Subjective relative income and lottery ticket purchases," *Journal of Behavioral Decision Making*, 21, 283–295.
- HANAOKA, C., H. SHIGEOKA, AND Y. WATANABE (2018): "Do risk preferences change? Evidence from the Great East Japan Earthquake," *American Economic Journal: Applied Economics*, 10, 298–330.
- HECKMAN, J. J., T. JAGELKA, AND T. KAUTZ (2021): "Some Contributions of Economics to the Study of Personality," in *Handbook of Personality: Theory and Research*, ed. by O. P. John and R. W. Robins, The Guilford Press, 853–892.
- HECKMAN, J. J. AND T. KAUTZ (2012): "Hard evidence on soft skills," *Labour Economics*, 19, 451–464.
- HECKMAN, J. J., J. STIXRUD, AND S. URZUA (2006): "The effects of cognitive and noncognitive abilities on labor market outcomes and social behavior," *Journal of Labor Economics*, 24, 411–482.
- HEY, J. D. AND P. J. LAMBERT (1980): "Relative Deprivation and the Gini Coefficient: Comment," *Quarterly Journal of Economics*, 95, 567–573.
- HFCS, DEUTSCHE BUNDESBANK (2016): "Vermögen und Finanzen privater Haushalte in Deutschland: Ergebnisse der Vermögensbefragung 2014," *Monatsbericht März*, 61.
- (2019): "Vermögen und Finanzen privater Haushalte in Deutschland: Ergebnisse der Vermögensbefragung 2017," *Monatsbericht April*, 71.
- HOPKINS, E. (2018): "Inequality and risk-taking behaviour," *Games and Economic Behavior*, 107, 316–328.
- HOPKINS, E. AND T. KORNIENKO (2004): "Running to keep in the same place: Consumer choice as a game of status," *American Economic Review*, 94, 1085–1107.
- INGLEHART, R., C. HAERPFER, A. MORENO, C. WELZEL, K. KIZILOVA, J. DIEZ-MEDRANO, M. LAGOS, P. NORRIS, E. PONARIN, B. PURANEN, ET AL. (2014): "World values survey: All rounds-country-pooled datafile version," *Madrid: JD Systems Institute*.

- JAGELKA, T. (forthcoming): "Are economists' preferences psychologists' personality traits? A structural approach," *Journal of Political Economy*.
- JAKIELA, P. AND O. OZIER (2019): "The impact of violence on individual risk preferences: evidence from a natural experiment," *Review of Economics and Statistics*, 101, 547–559.
- JUDGE, T. A., A. EREZ, J. E. BONO, AND C. J. THORESEN (2002): "Are measures of self-esteem, neuroticism, locus of control, and generalized self-efficacy indicators of a common core construct?" *Journal of Personality and Social Psychology*, 83, 693.
- KARADJA, M., J. MOLLERSTROM, AND D. SEIM (2017): "Richer (and holier) than thou? The effect of relative income improvements on demand for redistribution," *Review of Economics and Statistics*, 99, 201–212.
- KIRCHLER, M., F. LINDNER, AND U. WEITZEL (2018): "Rankings and Risk-Taking in the Finance Industry," *Journal of Finance*, 73, 2271–2302.
- KUZIEMKO, I., R. W. BUELL, T. REICH, AND M. I. NORTON (2014): "'Last-place aversion': Evidence and redistributive implications," *Quarterly Journal of Economics*, 129, 105–149.
- LA FERRARA, E. (2019): "Aspirations, social norms, and development," *Journal of the European Economic Association*, 17, 1687–1722.
- LENER, J. S. AND D. KELTNER (2001): "Fear, anger, and risk." *Journal of Personality and Social Psychology*, 81, 146.
- LJUNGQVIST, L. AND H. UHLIG (2000): "Tax policy and aggregate demand management under catching up with the Joneses," *American Economic Review*, 90, 356–366.
- LOEWENSTEIN, G. F., E. U. WEBER, C. K. HSEE, AND N. WELCH (2001): "Risk as feelings." *Psychological Bulletin*, 127, 267.
- LUTTMER, E. (2005): "Neighbors as negatives: Relative earnings and well-being," *Quarterly Journal of Economics*, 120, 963–1002.
- MALMENDIER, U. AND S. NAGEL (2011): "Depression babies: Do macroeconomic experiences affect risk taking?" *Quarterly Journal of Economics*, 126, 373–416.

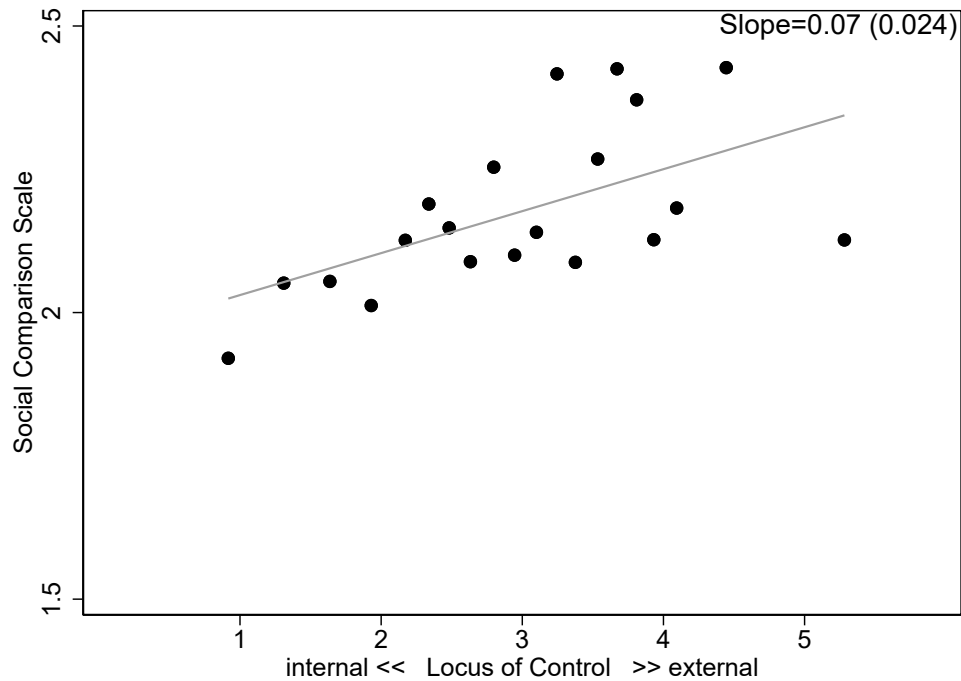
- MEIER, A. N. (2022): "Emotions and risk attitudes," *American Economic Journal: Applied Economics*, 14, 527–558.
- MENON, G., P. RAGHUBIR, AND N. SCHWARZ (1997): "How much will I spend? Factors affecting consumers' estimates of future expense," *Journal of Consumer Psychology*, 6, 141–164.
- NOLTE, H., C. WEISCHER, U. WILKESMANN, J. MAETZEL, AND H. G. TEGETHOFF (1997): "Kontrolleinstellungen zum Leben und zur Zukunft–Auswertung eines neuen, sozialpsychologischen Itemblocks im sozio-oekonomischen Panel," *Diskussionspapier der Fakultät für Sozialwissenschaft der Ruhr-Universität Bochum*.
- NORTON, M. I. AND D. ARIELY (2011): "Building a better America—One wealth quintile at a time," *Perspectives on Psychological Science*, 6, 9–12.
- PEREZ-TRUGLIA, R. (2020): "The Effects of income transparency on well-being: Evidence from a natural experiment," *American Economic Review*, 110, 1019–54.
- PICKARD, H., T. DOHMEN, AND B. VAN LANDEGHEM (2023): "Inequality and Risk Preference," *IZA Discussion Paper No. 15854*.
- PINGER, P., S. SCHÄFER, AND H. SCHUMACHER (2018): "Locus of control and consistent investment choices," *Journal of Behavioral and Experimental Economics*, 75, 66–75.
- RABIN, M. (2000): "Risk aversion and Expected-Utility Theory: A calibration theorem," *Econometrica*, 68, 1281–1292.
- RAY, D. AND A. ROBSON (2012): "Status, intertemporal choice, and risk-taking," *Econometrica*, 80, 1505–1531.
- RICHTER, D., M. METZING, M. WEINHARDT, AND J. SCHUPP (2013): "SOEP scales manual," Tech. rep., SOEP Survey Papers.
- RICHTER, D. AND J. SCHUPP (2015): "The SOEP Innovation Sample (SOEP IS)," *Schmollers Jahrbuch*, 135, 389–399.
- ROBSON, A. J. (1996): "The evolution of attitudes to risk: Lottery tickets and relative wealth," *Games and Economic Behavior*, 14, 190–207.

- ROCKWOOD, T. H., R. L. SANGSTER, AND D. A. DILLMAN (1997): "The effect of response categories on questionnaire answers: context and mode effects," *Sociological Methods & Research*, 26, 118–140.
- ROTH, P. (2023): "Inequality, Relative Deprivation and Financial Distress: Evidence from Swedish Register Data," *Review of Economics and Statistics*, 1–45.
- ROTTER, J. B. (1966): "Generalized expectancies for internal versus external control of reinforcement." *Psychological Monographs: General and Applied*, 80, 1.
- SAHM, C. R. (2012): "How much does risk tolerance change?" *Quarterly Journal of Finance*, 2, 1250020.
- SCHILDBERG-HÖRISCH, H. (2018): "Are risk preferences stable?" *Journal of Economic Perspectives*, 32, 135–54.
- SCHNEIDER, S. AND J. SCHUPP (2011): "The social comparison scale: testing the validity, reliability, and applicability of the Iowa-Netherlands Comparison Orientation Measure (INCOM) on the German population," .
- SCHRÖDER, C., C. BARTELS, K. GÖBLER, M. M. GRABKA, J. KÖNIG, R. SIEGERS, AND S. ZINN (2020): "Improving the coverage of the top-wealth population in the Socio-Economic Panel (SOEP)," Tech. rep., DIW Berlin, The German Socio-Economic Panel (SOEP).
- SCHWARTZ, S. H. (1992): "Universals in the content and structure of values: Theoretical advances and empirical tests in 20 countries," *Advances in Experimental Social Psychology*, 25, 1–65.
- SCHWARZ, N., H.-J. HIPPLER, B. DEUTSCH, AND F. STRACK (1985): "Response scales: Effects of category range on reported behavior and comparative judgments," *Public Opinion Quarterly*, 49, 388–395.
- SCHWERTER, F. (2023): "Social reference points and risk taking," *Management Science*, forthcoming.
- SPECHT, J., B. EGLOFF, AND S. C. SCHMUKLE (2013): "Everything under control? The effects of age, gender, and education on trajectories of perceived control in a nationally representative German sample." *Developmental Psychology*, 49, 353.
- TANGNEY, J. P., R. F. BAUMEISTER, AND A. L. BOONE (2004): "High self-control predicts good adjustment, less pathology, better grades, and interpersonal success," *Journal of Personality*, 72, 271–324.

- TESTA, M. AND B. MAJOR (1990): "The impact of social comparisons after failure: The moderating effects of perceived control," *Basic and Applied Social Psychology*, 11, 205–218.
- VEBLEN, T. (1899): *The theory of the leisure class*, New York: MacMillan.
- VON DER HEIDEN, J. M. AND B. EGLOFF (2021): "Associations of the Big Five and locus of control with problem gambling in a large Australian sample," *PLOS ONE*, 16, 1–12.
- VOORS, M. J., E. E. NILLESEN, P. VERWIMP, E. H. BULTE, R. LENSINK, AND D. P. VAN SOEST (2012): "Violent conflict and behavior: a field experiment in Burundi," *American Economic Review*, 102, 941–64.
- WILLS, T. A. (1981): "Downward comparison principles in social psychology," *Psychological Bulletin*, 90, 245.
- WOOD, J. V. AND K. L. TAYLOR (1991): "Serving self-relevant goals through social comparison," in *Social comparison: Contemporary theory and research*, ed. by J. Suls and T. A. Wills, Lawrence Erlbaum Associates, Inc., 23–49.
- YITZHAKI, S. (1979): "Relative deprivation and the Gini coefficient," *Quarterly Journal of Economics*, 93, 321–324.

Figures

Figure 1: Locus of Control and Relative Comparisons



Notes: Binned scatterplots of LoC and relative comparisons using data from a different representative SOEP-IS sample ($N = 1,388$). LoC is proxied by the belief that *life is mostly controlled by fate* and the belief that *working hard enough likely results in a good life*; we constructed an equally weighted index of these two beliefs with higher values indicating more external beliefs. Relative comparisons are measured with a short version of the Social Comparison Scale (Schneider and Schupp, 2011), which is an equally weighted index of three statements about a person's tendency to engage in social comparisons with higher values indicating higher dispositions towards social comparison. The statements are *I often compare myself with others with respect to what I have accomplished in life*, *I often compare my social skills and popularity with those of other people*, and *I always pay very strong attention to how I do things compared to others*. All measured on a scale from 1 (disagree strongly) to 5 (agree strongly). Control variables include age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, homeownership, satisfaction with health, life satisfaction, and region (East/West Germany). Data: SOEP-IS Sample I2/I4.

Tables

Table 1: Wealth Categories by Treatment

Control Group		Treatment Group	
<i>Wealth Category (in €)</i>	<i>% responses</i>	<i>Wealth Category (in €)</i>	<i>% responses</i>
<2,500	27.05	<275,000	79.01
2,501 – 11,000	20.00	275,001 – 468,000	12.74
11,001 – 27,000	11.59	468,001 – 722,000	5.19
27,001 – 112,000	16.82	722,001 – 989,000	1.65
>112,000	24.55	>989,000	1.42

Notes: Wealth categories used in the two conditions and share of observed responses in each category. Upper bounds taken from 2014 Household Finance and Consumption Survey (HFCS, Deutsche Bundesbank, 2016). Data: SOEP-IS Sample I3.

Table 2: First Stage Effects of Treatment

	Qual. Rel. Wealth	Rel. Wealth	Wealth p50	Top 10%
	(1)	(2)	(3)	(4)
Treated	-0.175*** (0.048)	-0.170*** (0.062)	0.204 (0.158)	0.293** (0.139)
Sample Observations	respondi 987	respondi 987	respondi 987	SOEP-IS 865

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regression (columns 1–2) and GLM regressions (gamma-log; columns 2–4) with standard errors in parentheses. “Qual. Rel. Wealth is a respondent’s perceived wealth situation relative to other households (“Compared to most other households in Germany, would you say that your wealth situation ...? is much worse, worse, the same, is better, or much better”). “Rel. wealth” is a respondent’s perceived rank in the wealth distribution (“What do you think is the share of households in Germany that have less net wealth than your household?”), which is standardized to zero mean and unit variance. “Wealth p50” is the estimate of the median of the wealth distribution (“What do you think is the net wealth of the household in the middle of the ladder?”). “Top 10%” is the estimated threshold for being in the top 10% of the pre-tax household income distribution in Germany (“In your estimation, what gross annual income do you need to be in the top 10 percent of German households?”). Covariates include age, gender, education, parents’ education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), homeownership, and region (East/West Germany). Data: respondi and SOEP-IS Sample I3.

Table 3: Main Treatment Effects

	CRRRA Parameter			
	(1)	(2)	(3)	(4)
Treated	-0.531*† (0.282)	-0.572**† (0.279)	-0.535*† (0.281)	-0.560**† (0.278)
Treated x LoC			-0.953***/# (0.283)	-0.948***/# (0.278)
LoC			0.566*** (0.208)	0.381* (0.214)
Baseline Risk	0.357** (0.141)	0.318** (0.142)	0.374*** (0.142)	0.347** (0.141)
Constant	2.865*** (0.199)	3.177** (1.243)	2.885*** (0.198)	3.417*** (1.248)
Covariates	No	Yes	No	Yes
Observations	914	914	914	914
Log-Likelihood	-2074.25	-2056.15	-2068.51	-2050.03

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$; † $p < 0.05$, p-value from randomization inference (5000 replications); # indicates significance when using the two-stage linear step-up procedure by Benjamini et al. (2006) that controls for the *false discovery rate* (FDR). Interval regressions with standard errors in parentheses. The dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). *LoC* is the z-score of a single index for locus of control, constructed as detailed in Table A1. Higher values correspond to more external beliefs. Covariates include age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), wealth, satisfaction with health, life satisfaction, and region (East/West Germany). Data: SOEP-IS Sample I3.

Appendix – For Online Publication Only

Status, Control, and Risk: How Relative Wealth Perceptions Shape Risk-Taking

Dietmar Fehr and Yannick Reichlin

A.1 Manipulation Check

Setup. After the main study, we conducted a separate survey experiment to examine whether the manipulation induced a feeling of low relative wealth. This allows us to economize on the limited survey time in SOEP-IS, where we only implemented a basic test of how the intervention affects relative standing, and to conduct a comprehensive manipulation check without running the risk of contaminating the outcomes through the first stage or the first stage through the outcomes or manipulation.

We recruited a new sample ($N = 987$) through *respondi*, an internationally well-known panel provider, since we no longer had access to the SOEP-IS. We implemented a short survey (median duration six minutes), in which we randomized respondents into treatment and control conditions using the same intervention as in the initial survey. That is, we either presented five wealth categories with wide intervals (treatment) or small intervals (control), and respondents had to indicate into which category their net wealth falls. Note that we updated the upper bounds of the intervals according to the latest available wealth data for Germany (see Table A18).

The aim of the manipulation check is to directly measure the impact of the intervention on (i) respondents' perceived relative position in the wealth distribution and (ii) the perceived wealth level. First, we test the relative standing channel through a qualitative and a quantitative question. Specifically, we ask how respondents perceive their wealth situation relative to other households and how they perceive their relative rank in the German wealth distribution.

1. Compared to most other households in Germany, would you say that your wealth situation is ...? [*much worse, worse, the same, better, much better*]

2. What do you think is the share of households in Germany that have less net wealth than your household?

0 percent (%) means that all households have more net wealth than your household and 100 percent (%) means that no household has more net wealth.

Second, we test to what extent the intervention affects how respondents perceive the wealth distribution. We address this issue by eliciting the perceived net wealth at the 50th and 90th percentile of the net wealth distribution. To familiarize respondents with this rather involved task, we first explain the meaning of wealth distribution, how one can partition the distribution into ten equally-sized bins, and what the median and 90th percentile is. To ease understanding, we illustrate this graphically with the help of a ladder with nine rungs that indicates the bottom 10% households, the median household, and the top 10% households. Subsequently, respondents estimate the net wealth of the median household and the top 10% household using a slider displaying values according to the function $Y = 500 * \exp^{(0.045 * steps)}$, where steps correspond to the slider range from 0 to 200. The specific questions are:

Now suppose we rank all households in Germany from lowest to highest net wealth and divide this ranking into 10 equal sections as shown on the ladder. On the ladder, the 10% poorest households would then be on the bottom rung and the 10% richest households on the top rung. The household in the middle divides the ranking into two halves, i.e. 50% of the households are richer, and 50% are poorer than the household in the middle.

3. What do you think is the net wealth of the household in the middle of the ladder?
4. You just estimated that the household in the middle of the ladder has a net wealth of *[estimated median]*€.

What do you think is the required net wealth to belong to the 10% richest households (i.e. to be on the top rung of the ladder)?

The survey concludes with a few questions on socio-economic characteristics and attitudes, including locus of control (LoC), self-esteem, and income adequacy.

Results. We discuss the results from this manipulation check in detail in Section 3 and briefly summarize them here. First, we show that treated respondents perceive their relative wealth situation as worse and rank themselves significantly lower in the wealth distribution than non-treated respondents (Table 2, columns 1–2). Second, we show that treated respondents estimate a

similar median net wealth as non-treated respondents (column 3). Third, in Table A6, we show that (i) respondents find the presentation of wealth categories equally credible in both conditions, (ii) status concerns do not affect LoC, and (iii) the treatment does not affect emotional states. In summary, the manipulation check demonstrates that the intervention affects relative wealth perceptions but not absolute wealth perceptions or other short-lived mechanisms.

A.2 A Simple Framework linking Relative Wealth and Risk-Taking with Locus of Control

This section introduces a simple theoretical framework to guide intuition around the empirical heterogeneity analysis in the paper. Extensive evidence suggests that locus of control (LoC) is associated with relative comparisons and risk-taking. The framework helps us to understand why respondents with a more external locus of control are (i) more risk-averse on average, and (ii) increase their risk-taking more strongly in response to the treatment manipulation.

Consider an individual who cares about both absolute consumption, c , and relative consumption, where relative consumption is defined by the position of the individual in the cumulative distribution function $F(c)$.¹ Let the utility over the two components be a weighted average with weight $\mu \in (0, 1)$:

$$U(c) = (1 - \mu)u(c) + \mu g(F(c)), \quad (\text{A1})$$

where $u(c)$ and $g(F(c))$ are continuously differentiable, strictly increasing in their arguments, and concave. In what follows, we are interested in how a decision-maker with preferences described by (A1) evaluates a lottery paying $x \sim G(x)$, and how this evaluation varies across personality types and shifts in the distribution $F(c)$.

Link Between Locus of Control and Average Risk Taking. Psychological evidence and our data suggest that people with an external LoC place a larger weight on relative comparisons than those with an internal locus of control. We can integrate this observation into the framework by assuming a positive correlation between LoC and μ . Note that, at the same time, a larger μ implies

¹We consider relative consumption instead of relative wealth to ease the exposition. The problem can be rewritten to incorporate relative wealth explicitly, even though it is appealing to think about agents caring about relative consumption as a signal of relative wealth. This has been done extensively in early models of conspicuous consumption.

that the curvature of $g(\cdot)$ has a stronger impact on risk aversion than the curvature of $u(\cdot)$. As long as individuals are more risk-averse about relative consumption than they are about absolute consumption – i.e., $g(\cdot)$ is “more concave” than $u(\cdot)$ – our framework predicts less risk-taking among individuals with an external LoC at baseline, which is in line with the commonly observed relationship between LoC and risk taking.

To see this, consider the certainty equivalent, CE , of the lottery $x \sim G(x)$, which is implicitly defined by:

$$(1 - \mu)u(CE) + \mu g(F(CE)) = \mathbb{E}_x [(1 - \mu)u(x) + \mu g(F(x))]. \quad (\text{A2})$$

Using the implicit function theorem, we know that:

$$\frac{\partial CE^*}{\partial \mu} = - \frac{-u(CE) + g(F(CE)) + \mathbb{E}_x [u(x) - g(F(x))]}{(1 - \mu)u'(CE) + \mu g'(F(CE))F'(CE)}. \quad (\text{A3})$$

Since $u', g' > 0$ by assumption and $F' > 0$ by definition of a CDF, the denominator is positive. A more external LoC is thus associated with more risk-aversion (a higher certainty equivalent) if and only if:

$$\begin{aligned} -u(CE) + g(F(CE)) + \mathbb{E}_x [u(x) - g(F(x))] &< 0 \\ \iff \\ \mathbb{E}_x [u(x)] - u(CE) &< \mathbb{E}_x [g(F(X))] - g(F(CE)) \end{aligned}$$

Note that in a model with only absolute or only relative preferences, the certainty equivalent would be defined exactly such that the expressions on either side of the inequality are zero. In our case, however, uncertainty is defined over both arguments, which implies that with varying degrees of risk-aversion in the two domains, the certainty equivalent can be “too low” or “too high” from the perspective of one argument in isolation. If CE is too high from a pure relativistic perspective, then $\mathbb{E}_x [g(F(x))] - g(F(CE)) > 0$. In this case, a decision-maker choosing only based on relative concerns would have accepted an even lower certainty equivalent. As long as the risk-aversion implied by $g(\cdot)$ is larger than the one by $u(\cdot)$, the above expression is thus satisfied.²

²As discussed extensively by Kuziemko et al. (2014), this aligns with motifs of last-place aversion, where relative improvements are felt particularly strongly at the bottom of the distribution. For higher consumption levels, the relative concerns become less relevant, and absolute consumption motifs dominate.

Treatment Variation and Heterogeneous Effects. The discussion so far offers an explanation for why individuals with an external LoC can act more risk-averse for a given relative position. However, assume that $F(c)$ describes a subjective belief, rather than the objective cumulative distribution function, and let $F_\tau(x) = F(x) + \tau\Delta(x)$ be a small perturbation of the subjective distribution.

Our treatment then induces a change in subjective beliefs ($\tau \neq 0$) with $\Delta(x) < 0$ for all x . That is, the treatment shifts the perceived distribution such that for a given level of consumption/wealth, the perceived relative position in the distribution is lower. Again, define the certainty equivalent implicitly as:

$$\Omega(CE, \tau) = (1 - \mu)u(CE) + \mu g(F_\tau(CE)) - \mathbb{E}_x[(1 - \mu)u(x) + \mu g(F_\tau(x))] = 0, \quad (\text{A4})$$

such that the certainty equivalent changes in response to our treatment in the following way:

$$\frac{\partial CE}{\partial \tau} = -\mu \left[\frac{g'(CE)\Delta(CE) - \mathbb{E}_x[g'(x)\Delta(x)]}{(1 - \mu)u'(CE) + \mu g'(F_\tau(CE))F'(CE)} \right]. \quad (\text{A5})$$

As in equation (A3), the denominator of this expression is positive. Using Jensen's inequality, we thus know that the overall expression is negative if $g''' > 0$. That is, if the decision maker exhibits prudence over relative comparisons, a deterioration in perceived relative standing leads to a lower certainty equivalent and more risk-taking on average.³

Importantly, differentiating further with respect to μ yields:

$$\frac{\partial^2 CE}{\partial \tau \partial \mu} = \frac{\partial CE}{\partial \tau} \left[\mu^{-1} + \frac{u''(CE) - g''(CE)}{(1 - \mu)u'(CE) + \mu g'(CE)} \right] < 0. \quad (\text{A6})$$

Above, we have established that $|u''(x)| < |g''(x)|$ is plausibly the case if individuals with a more external LoC are more risk-averse at baseline. Concavity further implies that both derivatives are weakly negative, rendering the term in square brackets positive. The sign of the cross-derivative is consequently equal to the sign of the first derivative (A5): people with a more external locus of control respond more strongly to the treatment. Empirically, we show that this response is negative on average, i.e., decision-makers become less risk-averse when they perceive their position in the distribution as low.

³The assumption of prudence is common in models of risk-taking. See, e.g., Hopkins (2018) for an example in the context of models with status concerns.

Discussion. The outlined theoretical framework predicts that if people are more risk-averse over relative consumption than over absolute consumption, we should expect, on average, more risk aversion from people with an external locus of control. If this is the case, however, our framework also predicts that an external LoC amplifies the response to the treatment manipulation. The empirical analysis demonstrates that both predictions are borne out in our data: we see that inducing a feeling of low relative standing in the wealth distribution increases risk-taking, on average, and that, in particular, externally oriented respondents are more responsive to the treatment manipulation. Finally, since people with an internal LoC place more weight on absolute consumption, they are less risk-averse and are less affected by the treatment manipulation.

Note that for the empirical analysis, we model subjects' preferences as CRRA over absolute consumption only, without explicitly incorporating relative preferences, as is the common approach in the literature. While this appears as if respondents' preferences are not stable, our framework offers an alternative interpretation that rationalizes the observed patterns of risk-taking as a response to "perceived" changes in relative standing.

A.3 Income Inequality, Risk-Taking, and Control Beliefs

In this section, we document the relationship between income inequality and risk-taking, and that an external locus of control moderates this relationship. Inequality is tightly linked to the relative position in the wealth (and income) distribution. The distribution of wealth affects how much richer others are, and this notion of relative deprivation translates into the Gini coefficient at the aggregate level (Yitzhaki, 1979; Hey and Lambert, 1980). The reported findings are based on the analysis of data from two large-scale international surveys: the Global Preference Survey (Falk et al., 2018) and the World Value Survey (Inglehart et al., 2014).

Global Preference Survey (GPS). The GPS contains a validated risk measure, elicited in nationally representative samples of 76 countries spanning some 90% of the world's population. The risk measure is a weighted average of a qualitative self-assessment of risk tolerance akin to the qualitative measure in the SOEP (see section 4.4) and a quantitative measure of a sequence of lottery choices. We focus here on the aggregated level and compare national-level summary statistics of the risk measure with a national-level measure of inequality, the Gini index, taken from the World Bank's World Development Indicators (WDI). The two measures are significantly correlated

($p=0.005$) with a Pearson correlation coefficient of 0.33, suggesting that in more unequal countries, the population is, on average, more risk-tolerant. Pickard et al. (2023), in work initiated after our initial working paper, provide a more detailed account of inequality and risk-taking using the GPS. We next turn to an individual-level analysis that allows us to consider the moderating effect of LoC.

World Value Survey (WVS). The WVS collects socio-demographic information, political attitudes, and value judgments from nationally representative samples in repeated cross-sections. Wave 5 (2005-2009) and Wave 6 (2010-2014) contain two questions that are particularly relevant to our purposes. First, the waves include a measure of risk attitudes developed by Schwartz (1992), which asks respondents to compare themselves to a hypothetical person who finds it important to “experience adventure and [take] risks.” Answers range on a scale from (1) *very much like me* to (6) *not at all like me*. The measure captures sensation-seeking as developed by personality psychologists and is conceptually related to economists’ notion of risk-aversion (Almlund et al., 2011). Second, they include a proxy for locus of control. Respondents are asked about their view of whether they can decide their own destiny or whether it is impossible to escape a predetermined fate on a scale from (1) *everything is determined by fate* to (10) *people shape their fate themselves*. To ease interpretation, we standardize answers to both questions by their sample mean and standard deviation and recode the LoC question such that higher values imply more external beliefs.

In our analysis, we use Waves 5 and 6 of the WVS and merge this data with information on national-level inequality from the WDI. This leaves us with a sample of 145,206 individual observations, coming from 71 countries and spanning 12 years. We estimate linear regressions of measured risk attitudes on a proxy for inequality, locus of control beliefs, and their interaction. Table A17 shows that individual risk aversion is negatively correlated with national-level inequality. This complements the aggregate-level correlation we have seen in the GPS that is based on a validated risk measure. Moreover, we see that this relationship is considerably more pronounced for individuals with external control beliefs and robust to including a battery of observable socio-demographic variables, survey year fixed effects, and dummies for cultural country clusters.

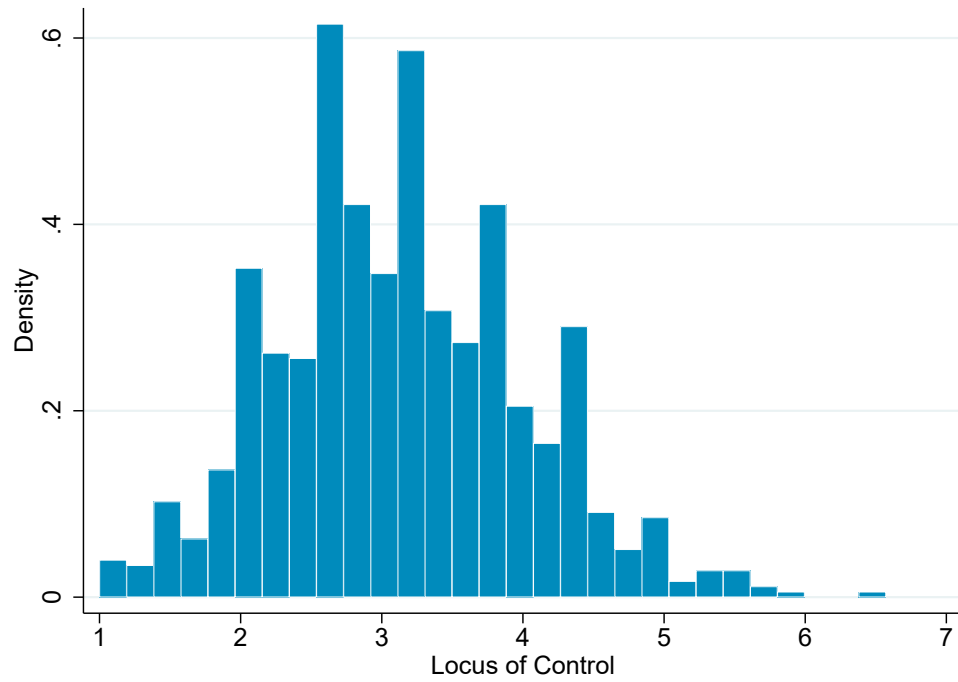
This result from the WVS suggests that our evidence has broader significance as it applies to the distribution of income, which itself may affect the degree to which people seek relative comparisons and extends beyond the German context.

A.4 Multiple Hypothesis Test Corrections

In Table 3, we show that respondents with more external beliefs react more strongly to our treatment. To test the robustness of this result, we examine a host of other personality traits (Table A13), emotions (Table A15), and socio-economic factors (Table A16) that may potentially interact with the treatment in some meaningful way. In total, we test 15 variations of regression specification (2). Thus, we control for multiple hypotheses testing using the false discovery rate (FDR), which is the expected proportion of falsely rejected null hypotheses among all rejected null hypotheses. Following Benjamini et al. (2006), we apply the two-stage linear step-up procedure to control for the FDR. Among the 15 hypotheses, only our main result on LoC is significant at a conventional level ($p < 0.001$, Table 3, column 4). This p-value is smaller than the threshold $q^* = 0.0031$ derived from the two-stage linear step-up procedure, the threshold of the Holm correction $\tilde{p} = 0.0033$, and the Bonferroni correction $\tilde{p} = 0.0033$. Accordingly, we can reject the null hypothesis for the interaction of LoC and treatment at conventional and adjusted p-values.

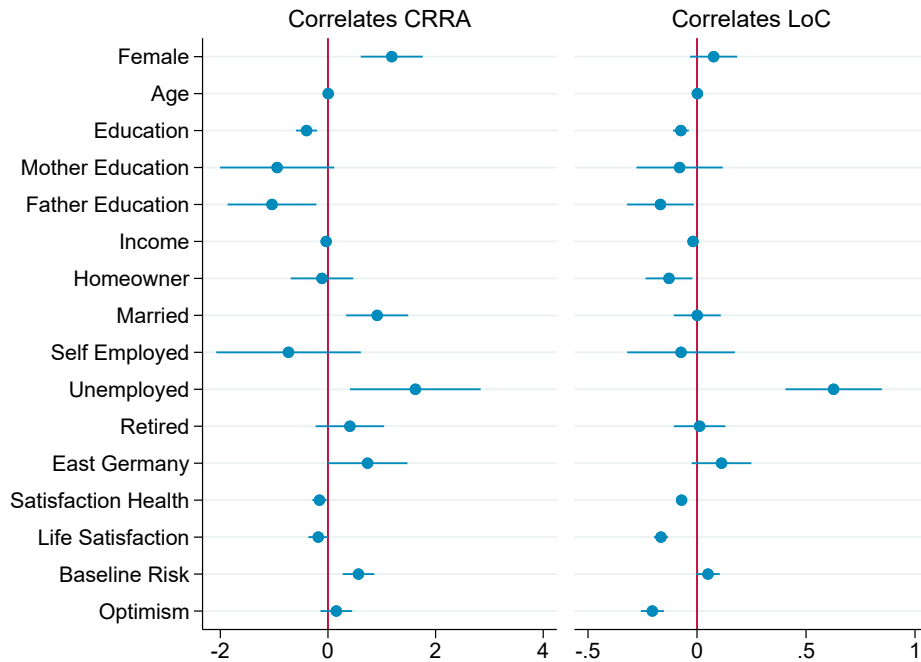
A.5 Additional Figures

Figure A1: Distribution of Locus of Control



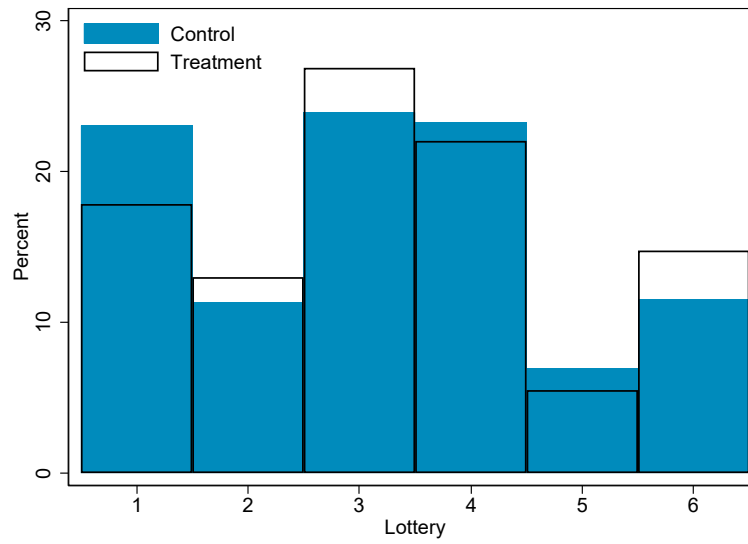
Notes: Histogram of Locus of Control based on the unweighted average of seven Locus of Control items (for more details on the constructed index, see Table A1). Higher values imply more external control beliefs. Data: SOEP-IS Sample I3.

Figure A2: Correlates of Risk and Locus of Control



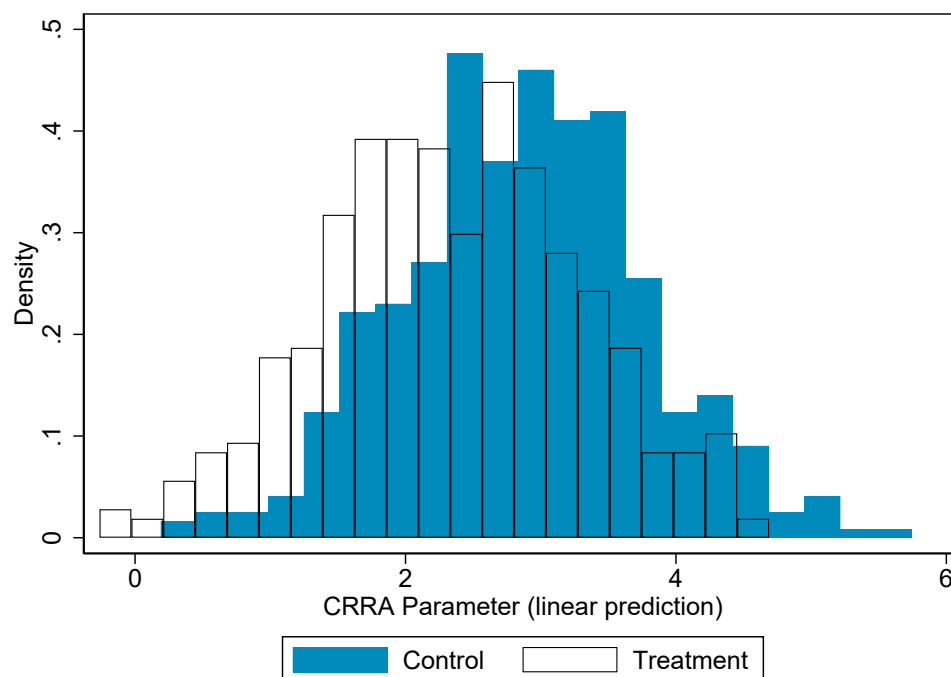
Notes: Coefficient plots from separate OLS regressions of the form $Y_i = \beta_0 + \beta_1 * Covariate + \epsilon_i$, where Y_i is either the CRRA parameter ρ (with higher values indicating less tolerance for risk) or Locus of Control (with higher values indicating more external control beliefs; see Table A1 for more details on the construction of the index). *Education* is measured in 7 categories according to the International Standard Classification of Education (ISCED), with higher categories representing a higher level of education. *Mother (Father) has Abitur* indicates a parent with qualification for university admission (Abitur is the final exam at the end of high school). *Income* is the equivalence scale determined by the square root scale (i.e., we divide the monthly household net income by the square root of the number of household members). *East Germany* is an indicator for respondents who lived in East Germany before 1990. *Homeowner* identifies respondents who own their house or apartment. *Female*, *Married*, *Self-employed*, *Unemployed*, and *Retired* are indicator variables. *Satisfaction with health* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Life Satisfaction* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Baseline Risk* is a qualitative risk measure on a scale from 0 (very willing to take risks) to 10 (not at all willing to take risks), standardized using the sample mean and standard deviation. *Optimism* is measured on a scale from 1 (optimistic) to 4 (pessimistic) and recoded such that higher values reflect more optimism. Data: SOEP-IS Sample I3.

Figure A3: Lottery Choices by Treatment



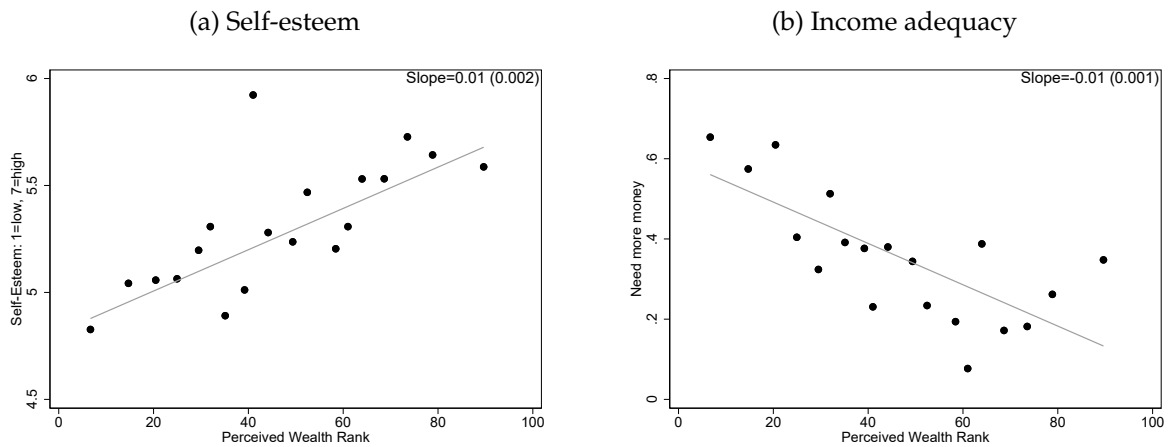
Notes: Distribution of lottery choices in the control (blue bars) and treatment condition (white bars). Lottery 1 pays €50 with equal probability (safe lottery) and subsequent lotteries become more risky with lottery 6 paying €200 and €0 with equal probability. See Table A2 for details. The propensity to choose the safe lottery (lottery 1) is lower in treatment than in the control condition ($p = 0.047$).

Figure A4: Distribution of Predicted CRRA Parameters by Treatment



Notes: Predicted CRRA parameters from interval regression regressing the CRRA parameter ρ on a treatment indicator and a set of standard covariates: age, gender, education, parents' education, equivalized net income, marital status, the number of household members, employment status (self-employed, unemployed, retired), baseline risk aversion, wealth, satisfaction with health, and region. Lower values of ρ indicate higher tolerance for risk. Data: SOEP-IS Sample I3.

Figure A5: Perceived Relative Wealth Rank and Self Perceptions



Notes: Binned scatterplot of perceived relative wealth rank and self perceptions using data from the manipulation check ($N = 987$). Panel (a) displays the relationship between perceived relative rank and self-esteem measured by agreement with statement “*I have a positive attitude towards myself*” on a scale from 1 (disagree) to 7 (agree). Panel (b) displays the relationship with income adequacy (“*Need more money to be able to live a satisfying life – yes/no*”). Data: respondi

A.6 Additional Tables

Table A1: Locus of Control Questions

Locus of Control Module Items					
	N	Mean	S.D.	Min	Max
IT 1: <i>The course of my life is depending on me.</i>	914	5.644	1.308	1	7
IT 2: <i>In comparison to others, I have not achieved what I deserve.</i>	914	3.111	1.700	1	7
IT 3: <i>What you achieve in life, is first of all a question of fate or luck.</i>	914	3.491	1.610	1	7
IT 4: <i>I often experience that others are deciding about my life.</i>	914	2.696	1.585	1	7
IT 5: <i>You have to work hard to be successful.</i>	914	5.910	1.118	1	7
IT 6: <i>When I face difficulties in life, I often doubt my abilities.</i>	914	3.170	1.615	1	7
IT 7: <i>Which opportunities I have in life is determined by social conditions.</i>	914	4.452	1.524	1	7
IT 8: <i>More important than all effort, are the abilities you have.</i>	914	4.828	1.354	1	7
IT 9: <i>I have little control over the things happening in my life.</i>	914	2.655	1.434	1	7
IT 10: <i>Social or political involvement can influence social conditions.</i>	914	3.958	1.652	1	7
Locus of Control Index					
$LoC = (-(IT1-8)+IT2+IT3+IT4+IT6+IT7+IT9)/7$	914	3.133	0.872	1	6.571
<i>External Scale (IT3, IT4, IT6, IT7, IT9)</i>	914	3.104	0.998	1	6.592
<i>Internal Scale (IT1, IT5)</i>	914	2.223	0.935	1	5.500

Notes: Descriptive statistics for each item in the Locus of Control (LoC) module. Each item required respondents to answer on a scale from 1 (disagree completely) to 7 (Agree completely). We follow Specht et al. (2013) and the SOEP scales manual Richter et al. (2013) and combine IT 1, IT 2, IT 3, IT 4, IT 6, IT 7, IT 9 in an equally weighted LoC index as in Cobb-Clark and Schurer (2013). As a robustness check, we consider two separate indices for the items corresponding to internal and external control beliefs, respectively Caliendo et al. (2015); Pinger et al. (2018); Caliendo et al. (2022). The items are weighted according to a principal component analysis. For the regression analyses, we use standardized versions of all indices with a mean of zero and standard deviation of one. The non-standardized figures here are for illustrative purposes. Data: SOEP-IS Sample I3.

Table A2: Overview of Gambles

	Payoffs	EV	S.D.	CRRA-Interval
<i>Lottery 1</i>	(50, 50)	50	0	$[7.51, \infty)$
<i>Lottery 2</i>	(45, 95)	70	25	$[1.74, 7.51]$
<i>Lottery 3</i>	(40, 120)	80	40	$[0.812, 1.74]$
<i>Lottery 4</i>	(30, 150)	90	60	$[0.315, 0.812]$
<i>Lottery 5</i>	(10, 190)	100	90	$[0, 0.315]$
<i>Lottery 6</i>	(0, 200)	100	100	$(-\infty, 0]$

Notes: Lotteries used in the risk elicitation task. Each lottery pays a low or high payoffs (in €) with equal probability. Respondents choose one of the lotteries and for every tenth respondent the chosen lottery was realized and paid out. Assuming CRRA utility of the form $u(x) = \frac{x^{1-\rho}}{1-\rho}$, where x is the respective payoff and ρ the coefficient of interest, we can calculate lower and upper bounds for relative risk aversion for each lottery. For example, comparing the expected utility of Lottery 2 and lottery 3 gives the lower bound of ρ for lottery 2 and the upper bound of ρ for lottery 3.

Table A3: Balance

	Mean Treatment	Mean Control	p-value
Female=1	0.54	0.53	0.906
Age	48.27	46.63	0.170
Lower secondary=1	0.15	0.14	0.915
Upper secondary=1	0.63	0.64	0.743
College=1	0.23	0.22	0.772
Mother has Abitur=1	0.08	0.11	0.126
Father has Abitur=1	0.14	0.17	0.319
Income (net/month)	2075.35	2203.91	0.076
Home owner=1	0.49	0.48	0.736
Log(wealth)	10.49	10.10	0.492
Married=1	0.53	0.54	0.633
No. of HH Members	2.35	2.44	0.218
Self employed=1	0.05	0.04	0.557
Unemployed=1	0.06	0.05	0.327
Retired=1	0.29	0.26	0.199
East Germany=1	0.19	0.17	0.303
Satisfaction with Health	6.79	6.62	0.273
Life Satisfaction	7.61	7.62	0.922
Baseline Risk	5.04	5.11	0.643
<i>Prob > F</i>			0.59

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Each row presents the means of *covariate* in the treatment and control group along with the p-values from separate OLS regressions of the form $Treated = \beta_0 + \beta_1 * Covariate + \epsilon_i$. *Prob > F* is the p-value from an F-test for joint significance of all covariates. Education is measured in 7 categories according to the International Standard Classification of Education (ISCED), where *Lower secondary* corresponds to the first two categories, *Upper secondary* to categories 3, 4, and 5, and *College* to the highest category (6). *Mother (Father) has Abitur* indicates a parent with qualification for university admission (Abitur is the final exam at the end of high school). *Income* is the equivalence scale determined by the square root scale (i.e., we divide the monthly household net income by the square root of the number of household members), *Homeowner* identifies respondents who own their house or apartment, and *Log(wealth)* is the log of the estimated wealth level of the household. *Female*, *Married*, *Self-employed*, *Unemployed*, and *Retired* are indicator variables. *East Germany* is an indicator for respondents who lived in East Germany before 1990. *Satisfaction with health* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Life Satisfaction* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Baseline Risk* is a qualitative risk measure on a scale from 0 (very willing to take risks) to 10 (not at all willing to take risks). Data: SOEP-IS Sample I3.

Table A4: Personality Traits – Balance

	Mean Treatment	Mean Control	p-value
Openness	-0.00	0.01	0.829
Conscientiousness	-0.02	-0.01	0.892
Extraversion	0.01	0.03	0.736
Agreeableness	-0.02	-0.00	0.820
Neuroticism	0.00	0.01	0.888
Optimism	-0.01	0.05	0.343
Relative Optimism	0.01	-0.01	0.776
Locus of Control	3.10	3.17	0.257
Self Control	-0.04	-0.06	0.773
<i>Prob > F</i>			0.966

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Each row presents the means of *covariate* in the treatment and control group along with the p-values from separate OLS regressions of the form $Treated = \beta_0 + \beta_1 * Covariate + \epsilon_i$. *Prob > F* is the p-value from an F-test for joint significance of all covariates. The Big 5 consist of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism*, which are standardized to a mean of zero and standard deviation of 1. *Optimism* indicates how respondents think about their future (“If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?”). We recoded the variable such that higher values reflect more optimism. *Relative optimism* is the unweighted average of four questions for which respondents had to indicate on a scale from 1 (“Very much less likely”) to 7 (“Very much more likely”) how they judged the likelihood to: (1) be financially successful; (2) become seriously ill; (3) be successful in their job; (4) be happy in general, relative to peers of the same age and sex. *Locus of Control* (LoC) is an equally weighted index of the LoC questions with higher values corresponding to more external beliefs. *Self-Control* is a standardized (mean zero, standard deviation 1) sum of 13 self-control indicators, in the spirit of Tangney et al. (2004). Data: SOEP-IS Sample I3.

Table A5: Correlates of Lottery Choice, Risk Aversion, and Locus of Control

	Lottery Choice		CRRA Parameter		Locus of Control	
	(1)	(2)	(3)	(4)	(5)	(6)
Female	-0.450*** (0.149)	-0.332** (0.149)	1.185*** (0.415)	0.887** (0.408)	0.076 (0.078)	0.039 (0.073)
Age	0.001 (0.004)	0.005 (0.006)	0.005 (0.011)	-0.006 (0.017)	0.002 (0.002)	0.002 (0.003)
Education	0.169*** (0.050)	0.121** (0.056)	-0.399*** (0.140)	-0.318** (0.154)	-0.074*** (0.026)	-0.045 (0.028)
Mother has Abitur	0.226 (0.275)	-0.230 (0.312)	-0.944 (0.765)	0.419 (0.857)	-0.080 (0.143)	0.113 (0.154)
Father has Abitur	0.363* (0.213)	0.286 (0.235)	-1.040* (0.596)	-0.690 (0.647)	-0.168 (0.111)	-0.064 (0.116)
Income (net/month)	0.013* (0.007)	0.000 (0.008)	-0.033* (0.020)	-0.006 (0.022)	-0.018*** (0.004)	-0.011*** (0.004)
Home owner	0.111 (0.150)	0.097 (0.161)	-0.112 (0.418)	-0.191 (0.442)	-0.129* (0.078)	-0.061 (0.079)
Married	-0.173 (0.150)	-0.348** (0.160)	0.914** (0.416)	1.314*** (0.439)	0.001 (0.078)	0.149* (0.079)
Self employed	0.444 (0.343)	0.058 (0.356)	-0.733 (0.969)	0.297 (0.982)	-0.073 (0.178)	0.101 (0.175)
Unemployed	-0.761** (0.311)	-0.575* (0.337)	1.624* (0.876)	1.196 (0.930)	0.626*** (0.160)	0.262 (0.166)
Retired	-0.109 (0.164)	-0.222 (0.245)	0.408 (0.459)	0.404 (0.677)	0.012 (0.085)	-0.024 (0.120)
East Germany	-0.121 (0.190)	-0.118 (0.192)	0.736 (0.535)	0.793 (0.532)	0.112 (0.099)	0.001 (0.095)
Satisfaction with Health	0.063* (0.034)	0.022 (0.040)	-0.157* (0.095)	-0.039 (0.109)	-0.071*** (0.017)	0.004 (0.020)
Life Satisfaction	0.085* (0.047)	0.067 (0.054)	-0.181 (0.132)	-0.157 (0.149)	-0.165*** (0.023)	-0.123*** (0.027)
Baseline Risk	-0.195*** (0.075)	-0.183** (0.075)	0.567*** (0.211)	0.546*** (0.209)	0.050 (0.039)	0.028 (0.037)
Optimism	-0.058 (0.076)	-0.114 (0.079)	0.155 (0.212)	0.305 (0.217)	-0.205*** (0.038)	-0.137*** (0.039)
Observations	446		446		446	

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Dependent variables are the lottery choice in columns 1-2, the CRRA parameter ρ (with higher values indicating less tolerance for risk) in columns 3-4, and Locus of Control (with higher values indicating higher control beliefs – external LoC) in columns 5-6. Data from control group only, interval regressions in columns 3-4 and otherwise OLS regressions (with standard errors in parentheses). Odd-numbered columns display coefficients from separate regressions for each covariate, while even-numbered columns report a multivariate regression including all covariates at once. *Education* is measured in 7 categories according to the International Standard Classification of Education (ISCED), with higher categories representing a higher level of education. *Mother (Father) has Abitur* indicates a parent with qualification for university admission (Abitur is the final exam at the end of high school). *Income* is the equivalence scale determined by the square root scale (i.e., we divide the monthly household net income by the square root of the number of household members) and *Homeowner* identifies respondents who own their house or apartment. *Female*, *Married*, *Self-employed*, *Unemployed*, and *Retired* are indicator variables. *East Germany* is an indicator for respondents who lived in East Germany before 1990. *Satisfaction with health* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Life Satisfaction* is measured on a scale from 0 (completely dissatisfied) to 10 (completely satisfied). *Baseline Risk* is a qualitative risk measure on a scale from 0 (very willing to take risks) to 10 (not at all willing to take risks), standardized using the sample mean and standard deviation. *Optimism* is measured on a scale from 1 (optimistic) to 4 (pessimistic) and recoded such that higher values reflect more optimism. Data: SOEP-IS Sample I3.

Table A6: Manipulation Check: Additional Outcomes

	Data Credibility	LoC	Self-esteem	Mood	Emotional
	(1)	(2)	(3)	(4)	(5)
Treated	0.006 (0.050)	-0.059 (0.064)	0.036 (0.084)	0.553 (1.299)	-1.443 (1.270)
Control Group Mean	3.706*** (0.036)	3.258*** (0.045)	5.241*** (0.060)	63.898*** (0.913)	90.415*** (0.892)
Sample	respondi	respondi	respondi	SOEP-IS	SOEP-IS
Observations	980	980	980	914	914
R2	0.07	0.09	0.09	0.08	0.05

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regression with standard errors in parentheses. Columns (1–3) based on respondi sample (see Section A.1) and columns (4–5) based on SOEP-IS Data. “Data Credibility” measures the credibility of the data on wealth categories (“The data on wealth categories comes from the Bundesbank. How credible do you consider these data to be?”; scale: 1 – not credible to 5 – very credible), “LoC” is an index for internal and external locus of control measured on a scale from 1 (internal) to 7 (external), “Self-esteem” measures a positive self-attitude (“I have a positive attitude towards myself.”; scale: 1 – does not apply at all to 7 – does apply), and “Mood” and “Emotional” are subscales of the SF12-Health Inventory measuring mood and limitations due to emotional problems (on a scale from 0 to 100). Covariates include age, gender, education, parents’ education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), homeownership, and region (East/West Germany). Data: SOEP-IS Sample I3 and respondi.

Table A7: Treatment Effect on the Propensity to Choose the Safe Lottery Option

	Full Sample	Above Median LOC (External)	Below Median LOC (Internal)
	(1)	(2)	(3)
Treated	-0.055** (0.027)	-0.139*** (0.038)	0.023 (0.038)
Constant	0.183 (0.119)	0.074 (0.162)	0.330* (0.182)
Covariates	Yes	Yes	Yes
Observations	914	452	462
R^2	0.04	0.08	0.04

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regressions with robust standard errors in parentheses. The dependent variable is an indicator for choosing lottery 1 (sure pay-off of 50€), instead of any other lottery option (see Table A2). Column (1) uses the full sample for the estimation, column (2) limits the sample to individuals with above median locus of control (externals), and column (3) restricts the sample to those with below median locus of control values (internals). Covariates include age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), wealth, satisfaction with health, life satisfaction, region (East/West Germany), and baseline risk aversion. Data: SOEP-IS Sample I3.

Table A8: Main Treatment Effects – Interval Midpoint

	CRRA Parameter (midpoint)					
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.486* (0.279)	-0.510* (0.278)	-0.505* (0.279)	-0.512* (0.279)	-0.522* (0.283)	-0.514* (0.284)
Treated x LoC	-0.929*** (0.280)	-0.950*** (0.278)	-0.933*** (0.280)	-0.953*** (0.279)	-0.949*** (0.285)	-0.934*** (0.286)
LoC	0.561*** (0.206)	0.383* (0.213)	0.312 (0.218)	0.389* (0.215)	0.407* (0.225)	0.329 (0.229)
Covariates	No	Yes	Yes	Yes	Yes	Yes
Big 5	No	No	Yes	No	No	Yes
Optimism	No	No	No	Yes	No	Yes
Self-Control	No	No	No	No	Yes	Yes
Observations	914	914	914	914	879	879

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regressions with standard errors in parentheses. Dependent variable is the midpoint of CRRA intervals (see Table A2, for the left- and right-censored interval, we use the upper and lower bound). Lower values indicate higher tolerance for risk. *LoC* is the z-score of a single index for locus of control, constructed as detailed in Table A1. Higher values correspond to more external beliefs. Covariates include: age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, wealth, satisfaction with health, and region (East/West Germany). *Big 5s* consist of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism*, which are standardized to a mean of zero and standard deviation of 1. *Optimism* indicates how respondents think about their future ("If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?"). We recoded the variable such that higher values reflect more optimism. *Self-Control* is the standardized sum of 13 self-control items, following Tangney et al. (2004). Higher values imply more indicated self-control. Data: SOEP-IS Sample I3.

Table A9: Non-participation in the survey module

Panel a.)			
Non-participation in treatment and control			
	Treatment	Control Mean	N
Non-participation	0.030 (0.023)	0.165 (0.016)	1,115
Panel b.)			
Baseline difference in risk aversion between participation and non-participation			
	Non-participation	Participation	N
Baseline Risk	-0.152 (0.185)	5.078 (0.078)	1,115
Panel c.)			
Baseline difference in risk aversion of non-participants in treatment and control			
	Treatment	Control	N
Baseline Risk	0.004 (0.328)	4.923 (0.242)	201

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regressions with standard errors in parentheses. Panel a) reports the difference in the likelihood of non-participation in treatment versus control (column Treatment) from regressing an indicator for non-participation on a treatment indicator. Panel b) reports the difference in baseline risk aversion between participating and non-participating respondents from regressing baseline risk aversion on an indicator of non-participation. Panel c) displays the difference in baseline risk aversion of non-participating respondents in treatment versus control (column Treatment) from regressing baseline risk aversion on a treatment indicator using non-participating respondents only. *Baseline Risk* is measured prior to the treatment on a scale from very willing to take risks (0) to not very willing to take risks (10). Data: SOEP-IS Sample I3.

Table A10: Results for Inverse Probability Re-Weighting

	CRRA Parameter							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Treated	-0.548* (0.287)	-0.595** (0.282)	-0.561* (0.288)	-0.587** (0.282)	-0.591** (0.282)	-0.589** (0.283)	-0.597** (0.285)	-0.599** (0.286)
Treated x LoC			-0.940*** (0.298)	-0.982*** (0.294)	-0.947*** (0.294)	-0.984*** (0.294)	-0.974*** (0.301)	-0.936*** (0.300)
LoC			0.617*** (0.226)	0.402* (0.233)	0.348 (0.237)	0.408* (0.234)	0.430* (0.244)	0.361 (0.245)
Covariates	No	Yes	No	Yes	Yes	Yes	Yes	Yes
Big 5	No	No	No	No	Yes	No	No	Yes
Optimism	No	No	No	No	No	Yes	No	Yes
Self-Control	No	No	No	No	No	No	Yes	Yes
Observations	914	914	914	914	914	914	879	879
Log-Likelihood	-2480.00	-2454.91	-2473.21	-2447.29	-2444.32	-2447.26	-2348.33	-2344.24

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Observations weighted by the inverse of the probability that they are part of our study sample. The propensity scores stem from a probit regression of an indicator for respondents in the study sample on the following covariates: age, equivalized net income, education, household size, satisfaction with health, life satisfaction, wealth and indicators for gender, marital status, employment status (self-employed, retired, unemployed), region (East/West Germany), wealth, qualification for university (Abitur) of mother and father, and baseline risk aversion. Big 5 consist of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism*, which are standardized to a mean of zero and standard deviation of 1. *Optimism* indicates how respondents think about their future ("If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?"). We recoded the variable, such that higher values reflect more optimism. *Self-Control* is the standardized sum of 13 self-control items, following Tangney et al. (2004). Higher values imply more indicated self-control. Data: SOEP-IS Sample I3.

Table A11: Heterogeneous Effects – Alternative LoC measures

	CRRRA Parameter			
	(1)	(2)	(3)	(4)
Treated	-0.523* (0.281)	-0.559** (0.277)	0.161 (0.397)	0.182 (0.391)
Treated x External Scale	-0.790*** (0.287)	-0.822*** (0.282)		
External Scale	0.535*** (0.207)	0.299 (0.210)		
Treated x Internal Scale	-0.279 (0.285)	-0.239 (0.281)		
Internal Scale	-0.025 (0.204)	-0.011 (0.206)		
LoC>Median			1.002** (0.398)	0.648 (0.404)
Treated x LoC>Median			-1.397** (0.564)	-1.506*** (0.555)
Covariates	No	Yes	No	Yes
Observations	914	914	914	914
Log-Likelihood	-2071.57	-2049.93	-2073.77	-2052.42

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). External and internal scale constructed as in Table A1. Both are standardized z-scores. “LoC>Median” is an indicator for LoC values above the median LoC, which is 3 on a scale from 1 (most internal) to 7 (most external). Covariates include: age, gender, education, parents’ education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, wealth, satisfaction with health, and region (East/West Germany). Data: SOEP-IS Sample I3.

Table A12: Heterogeneous Effects - Locus of Control & Other Personality Traits

	CRRRA Parameter					
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.525* (0.282)	-0.554** (0.278)	-0.553** (0.277)	-0.544** (0.277)	-0.586** (0.281)	-0.556** (0.281)
Treated x LoC	-0.917*** (0.284)	-0.957*** (0.278)	-0.988*** (0.297)	-1.088*** (0.286)	-1.079*** (0.294)	-1.189*** (0.310)
LoC	0.589*** (0.209)	0.378* (0.214)	0.357 (0.222)	0.456** (0.218)	0.479** (0.228)	0.505** (0.236)
Covariates	No	Yes	Yes	Yes	Yes	Yes
Big 5	No	No	Yes	No	No	Yes
Optimism	No	No	No	Yes	No	Yes
Self-Control	No	No	No	No	Yes	Yes
Observations	914	914	914	914	879	879
Log-Likelihood	-2071.99	-2049.53	-2046.67	-2047.65	-1971.02	-1965.40

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). *LoC* is the z-score of a single index for locus of control, constructed as detailed in Table A1. Higher values correspond to more external beliefs. Covariates include: age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, wealth, satisfaction with health, life satisfaction, region (East/West Germany), and baseline risk aversion. *Big 5* consist of *Openness*, *Conscientiousness*, *Extraversion*, *Agreeableness*, and *Neuroticism*, which are standardized to a mean of zero and standard deviation of 1. *Optimism* indicates how respondents think about their future ("If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?"). We recoded the variable, such that higher values reflect more optimism. *Self-Control* is the standardized sum of 13 self-control items, following Tangney et al. (2004). Higher values imply more indicated self-control. We include interaction terms between the treatment indicator and all personality traits. Data: SOEP-IS Sample I3.

Table A13: Heterogeneous Effects – Other Personality Traits

	CRRRA Parameter						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Neuroticism	Agreeableness	Extraversion	Openness	Conscientiousness	Optimism	Self-Control	
Treated	-0.566** (0.278)	-0.576** (0.279)	-0.568** (0.279)	-0.570** (0.279)	-0.568** (0.279)	-0.562** (0.279)	-0.565** (0.283)
Interaction Effect	-0.145 (0.280)	0.054 (0.278)	0.039 (0.283)	0.283 (0.282)	0.073 (0.278)	-0.304 (0.284)	-0.176 (0.283)
Level Effect	0.319 (0.200)	0.155 (0.199)	-0.013 (0.212)	-0.091 (0.205)	0.078 (0.203)	0.174 (0.206)	0.312 (0.205)
Observations	914	914	914	914	914	914	879
Log-Likelihood	-2054.18	-2054.97	-2055.78	-2055.23	-2055.44	-2055.21	-1977.96

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). "Interaction Effect" is the interaction between Treated and the corresponding personality trait indicated on top of a column, while "Level Effect" corresponds to the association between personality trait and dependent variable. All personality traits are standardized to have a mean of zero and standard deviation of one. Columns 1-5 show the Big 5 traits and columns 6-7 indicate *Optimism* and *Self-Control* measures. *Optimism* indicates how respondents think about their future ("If you think about the future: Are you... (1) optimistic; (2) rather optimistic than pessimistic; (3) rather pessimistic than optimistic; (4) pessimistic?"). We recoded the variable, such that higher values reflect more optimism. *Self-Control* is the standardized sum of 13 self-control items, following Tangney et al. (2004). Higher values imply more indicated self-control. Data: SOEP-IS Sample I3.

Table A14: Heterogeneous Effects - Locus of Control & Emotions

	CRRRA Parameter					
	(1)	(2)	(3)	(4)	(5)	(6)
Treated	-0.525* (0.282)	-0.554** (0.278)	-0.565** (0.277)	-0.553** (0.277)	-0.554** (0.278)	-0.569** (0.277)
Treated x LoC	-0.917*** (0.284)	-0.957*** (0.278)	-0.951*** (0.278)	-0.952*** (0.278)	-0.955*** (0.278)	-0.940*** (0.278)
LoC	0.589*** (0.209)	0.378* (0.214)	0.408* (0.215)	0.339 (0.214)	0.383* (0.215)	0.379* (0.215)
Covariates	No	Yes	Yes	Yes	Yes	Yes
Happiness Index	No	No	Yes	No	No	Yes
Anger	No	No	No	Yes	No	Yes
Fear	No	No	No	No	Yes	Yes
Observations	914	914	914	914	914	914
Log-Likelihood	-2071.99	-2049.49	-2048.63	-2047.42	-2049.47	-2045.55

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). *LoC* is the z-score of a single index for locus of control, constructed as detailed in Table A1. Higher values correspond to more external beliefs. Covariates include: age, gender, education, parents' education, equivalized net income, marital status, household size, employment status (self-employed, unemployed, retired), baseline risk aversion, wealth, satisfaction with health, life satisfaction, and region (East/West Germany). *Emotions* indicate the frequency of feeling *happy*, *sad*, *angry*, and *fearful* in the last four weeks and is measured on a scale from very rarely (1) to very often (5). *Happiness Index* is an unweighted index of happiness and sadness computed as $(happiness - sadness)/2 + 3$ to equal the range of the other emotions (Anger and Fear). Data: SOEP-IS Sample I3.

Table A15: Heterogeneous Effects - Emotions

	CRRRA Parameter		
	(1) Happiness Index	(2) Anger	(3) Fear
Treated	-2.698* (1.405)	-0.567 (0.822)	-0.882 (0.622)
Interaction Effect	0.589 (0.372)	0.013 (0.283)	0.196 (0.304)
Level Effect	-0.249 (0.257)	0.348* (0.193)	0.031 (0.222)
Observations	914	914	914
Log-Likelihood	-2076.16	-2074.26	-2076.82

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). "Interaction Effect" is the interaction between Treated and the corresponding emotion indicated on top of a column, while "Level Effect" corresponds to the association between emotion and dependent variable. *Emotions* indicate the frequency of feeling *happy*, *sad*, *angry*, and *fearful* in the last four weeks and is measured on a scale from very rarely (1) to very often (5). *Happiness Index* is an unweighted index of happiness and sadness computed as $(happiness - sadness)/2 + 3$ to equal the range of the other emotions (Anger and Fear). Data: SOEP-IS Sample I3.

Table A16: Heterogeneous Effects - Socio-economic Characteristics

	CRRRA Parameter			
	(1) Female	(2) Unemployed	(3) Income	(4) Education
Treated	-0.297 (0.411)	-0.456 (0.290)	-3.731 (4.370)	-0.989 (0.755)
Interaction Effect	-0.416 (0.563)	-0.834 (1.270)	0.430 (0.577)	0.127 (0.191)
Level Effect	1.166*** (0.397)	1.588* (0.836)	-0.741* (0.402)	-0.391*** (0.134)
Observations	914	914	914	914
Log-Likelihood	-2071.37	-2075.30	-2075.44	-2071.30

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. Interval regressions with standard errors in parentheses. Dependent variable is the CRRRA parameter ρ (with lower values indicating higher tolerance for risk). "Interaction Effect" is the interaction between Treated and the corresponding emotion indicated on top of a column, while "Level Effect" corresponds to the association between emotion and dependent variable. *Female* and *Unemployment* are indicators for gender and employment status. *Income* is the equivalence scale determined by the square root scale (i.e., we divide the monthly household net income by the square root of the number of household members). *Education* is measured in 7 categories according to the International Standard Classification of Education (ISCED), with higher categories representing a higher level of education. Data: SOEP-IS Sample I3.

Table A17: Inequality and Locus of Control

	Risk Aversion			
	(1)	(2)	(3)	(4)
Inequality: Gini	-1.185** (0.456)	-0.756* (0.431)	-0.169 (0.364)	-0.275 (0.367)
Inequality x LoC	-0.482** (0.200)	-0.322** (0.160)	-0.295*** (0.110)	-0.278** (0.118)
LoC	0.253*** (0.075)	0.161*** (0.060)	0.164*** (0.043)	0.157*** (0.046)
Constant	0.447** (0.171)	-0.264 (0.233)	-0.286* (0.145)	-0.323** (0.132)
Individual Covariates	No	Yes	Yes	Yes
Region FE	No	No	Yes	Yes
Survey Year FE	No	No	No	Yes
Observations	145,206	130,068	130,068	130,068
Countries	71	70	70	70
R ²	0.02	0.09	0.11	0.12

Notes: * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. OLS regressions on the relationship between income inequality and risk aversion using data from the *World Value Survey*. Standard errors, clustered at the country level, in parentheses. The dependent variable is Schwartz's risk sensation seeking measure. Higher values imply higher risk aversion. Inequality measured by the national-level Gini coefficient, after tax and transfers. Higher values imply higher inequality (Scale: 0 to 1). Locus of Control (LoC) is proxied by the standardized answers to the question: "Some people feel they have completely free choice and control over their lives, while other people feel that what they do has no real effect on what happens to them. Indicate how much freedom of choice and control you feel you have over the way your life turns out (Scale from 1 – "a great deal" – to 10 – "none at all")." *Individual covariates* include marital status, number children, subjective health status, satisfaction with financial situation of household, gender, age, education, and employment status. *Region FE* include the Arab World/Maghreb states, Latin Europe, post-Soviet countries, Eastern Europe, Nordic/Germanic countries, Latin American, South/East Asia, and Sub-Saharan Africa. The reference category is Anglo-Saxon countries. *Survey Year FE* is an indicator for wave 5 (base is wave 6). Data: World Values Survey: wave 5 and 6.

Table A18: Wealth Categories by Condition – Manipulation Check

Control Group	Treatment Group
Up to 3,000€	Up to 334,000€
3,001€ to 11,800€	334,001€ to 555,400€
11,801€ to 31,200€	555,401€ to 861,600€
31,201€ to 131,000€	861,601€ to 1,292,100€
More than 131,000€	More than 1,292,100€

Notes: Wealth categories used in the control and treatment condition. Upper bounds taken from 2017 Household Finance and Consumption Survey (HFCS, Deutsche Bundesbank, 2019).

A.7 Survey Module – SOEP-IS

Our survey module consists of three parts: questions on personality traits, the treatment manipulation, and a lottery task to measure risk-taking. In what follows, we list the English wording of each question (translated from German).

Optimism. We measure optimism with two questions: a general question about optimism regarding the future taken from the SOEP, and a question about the likelihood of experiencing an event relative to an average person:

1. *When you think about the future: are you... [Scale: (i) ...optimistic, (ii) ...rather optimistic than pessimistic, (iii) ...rather pessimistic than optimistic, (iv) ...pessimistic?]*
2. *Compared to other people of the same age and gender as you: how likely is it that throughout your life you will...*
 - *...be financially successful?*
 - *...not suffer from a serious illness?*
 - *...be successful in your job?*
 - *...be satisfied overall?*

For each component subjects could answer on a scale from 1 to 7, where 1 implies very much less likely, 4 implies as likely as the average person, and 7 implies very much more likely.

Locus of Control. We implemented the same ten items that are routinely used in the SOEP (Nolte et al., 1997). respondents answered on a Likert-scale ranging from 1 (disagree completely) to 7 (agree completely):

The following statements capture different attitudes towards life and the future. To which degree do you personally agree with the statements?

- (i) *The course of my life is depending on me.*
- (ii) *In comparison to others, I have not achieved what I deserve.*
- (iii) *What you achieve in life, is first of all a question of fate or luck.*
- (iv) *I often experience that others are deciding about my life.*

- (v) *You have to work hard to be successful.*
- (vi) *When I face difficulties in life, I often doubt my abilities.*
- (vii) *Which opportunities I have in life is determined by social conditions.*
- (viii) *More important than all effort, are the abilities you have.*
- (ix) *I have little control over the things happening in my life.*
- (x) *Social or political involvement can influence social conditions.*

Treatment Manipulation. Our treatment manipulation is embedded in a question about respondent's wealth. Specifically, we ask respondents to indicate their net wealth using five predefined wealth categories. To manipulate respondents' perception regarding the distribution of wealth, we randomly vary the available categories. That is, we assign half of the respondents to categories with relatively wide intervals (treatment group), while the other half of respondents is assigned to much smaller intervals (control group):

Now I would like to talk with you about wealth. One can divide households in Germany into five categories of wealth. Wealth in this context refers to net wealth. That is, it is equivalent to total household wealth including cash, savings accounts, stocks and real estate, minus debts, such as loans, mortgages, or credit card debt. Please indicate to which category your household belongs:

- (i) *Up to €2,500 (**Treatment Group:** Up to €275,000)*
- (ii) *€2,501 to €11,000 (€275,001 to €468,000)*
- (iii) *€11,001 to €27,000 (€468,001 to €722,000)*
- (iv) *€27,001 to €112,000 (€722,001 to €989,000)*
- (v) *More than €112,001 (More than €989,001)*

Risk Elicitation. In the risk elicitation part respondents faced two questions. The first question asked them to indicate whether they would like to participate in a lottery game, whereas the second contained the actual lottery choice:

Now let us turn to a special task with which we try to understand how people make financial decisions. We will present you with six lotteries. We ask you to choose one of the six lotteries. At the end of

*this block of questions every 10th respondent will be randomly chosen to actually receive the winnings from their chosen lottery. The actual payment will be made at the end of the complete questionnaire. [Answers: (1) start the lottery game, (2) I do not want to participate because...*open].*

I will now show you six different lotteries on the screen. Each lottery consists of two pay-offs, each of which can be drawn with equal probability. The lotteries differ in the sense that for each lottery you have an equal chance of winning different amounts of money. At the end of this module we will determine whether your choice will actually be paid out to you. Which lottery do you choose?

- (i) Lottery 1: 50% 50€ / 50% 50€
- (ii) Lottery 2: 50% 45€ / 50% 95€
- (iii) Lottery 3: 50% 40€ / 50% 120€
- (iv) Lottery 4: 50% 30€ / 50% 150€
- (v) Lottery 5: 50% 10€ / 50% 190€
- (vi) Lottery 6: 50% 0€ / 50% 200€

Top-10% income threshold. *In your estimation, what gross annual income do you need to be in the top 10 percent of German households?*