ECONSTOR
Make Your Publications Visible.

A Service of
ZBW
Leibniz-Informationszentrum Wirtschaft
Leibniz Information Centre for Economics

Dohmen, Thomas; Quercia, Simone; Willrodt, Jana

Working Paper

Willingness to take risk: The role of risk conception and optimism

SOEPpapers on Multidisciplinary Panel Data Research, No. 1026

Provided in Cooperation with:
German Institute for Economic Research (DIW Berlin)

Suggested Citation: Dohmen, Thomas; Quercia, Simone; Willrodt, Jana (2019) : Willingness to take risk: The role of risk conception and optimism, SOEPpapers on Multidisciplinary Panel Data Research, No. 1026, Deutsches Institut für Wirtschaftsforschung (DIW), Berlin

This Version is available at:
https://hdl.handle.net/10419/195176

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.

WWW.ECONSTOR.EU

Mitglied der Leibniz-Gemeinschaft

SOEP The German Socio-Economic Panel study

1026 2019

SOEPpapers
on Multidisciplinary Panel Data Research

SOEP – The German Socio-Economic Panel Study at DIW Berlin 1026-2019

Willingness to take risk: The role of risk conception and optimism

Thomas Dohmen, Simone Quercia, Jana Willrodt

DIW SOEP

SOEPpapers on Multidisciplinary Panel Data Research at DIW Berlin

This series presents research findings based either directly on data from the German Socio-Economic Panel study (SOEP) or using SOEP data as part of an internationally comparable data set (e.g. CNEF, ECHP, LIS, LWS, CHER/PACO). SOEP is a truly multidisciplinary household panel study covering a wide range of social and behavioral sciences: economics, sociology, psychology, survey methodology, econometrics and applied statistics, educational science, political science, public health, behavioral genetics, demography, geography, and sport science.

The decision to publish a submission in SOEPpapers is made by a board of editors chosen by the DIW Berlin to represent the wide range of disciplines covered by SOEP. There is no external referee process and papers are either accepted or rejected without revision. Papers appear in this series as works in progress and may also appear elsewhere. They often represent preliminary studies and are circulated to encourage discussion. Citation of such a paper should account for its provisional character. A revised version may be requested from the author directly.

Any opinions expressed in this series are those of the author(s) and not those of DIW Berlin. Research disseminated by DIW Berlin may include views on public policy issues, but the institute itself takes no institutional policy positions.

The SOEPpapers are available at
http://www.diw.de/soeppapers

Editors:
Jan **Goebel** (Spatial Economics)
Stefan **Liebig** (Sociology)
David **Richter** (Psychology)
Carsten **Schröder** (Public Economics)
Jürgen **Schupp** (Sociology)

Conchita **D'Ambrosio** (Public Economics, DIW Research Fellow)
Denis **Gerstorf** (Psychology, DIW Research Fellow)
Elke **Holst** (Gender Studies, DIW Research Director)
Martin **Kroh** (Political Science, Survey Methodology)
Jörg-Peter **Schräpler** (Survey Methodology, DIW Research Fellow)
Thomas **Siedler** (Empirical Economics, DIW Research Fellow)
C. Katharina **Spieß** (Education and Family Economics)
Gert G. **Wagner** (Social Sciences)

ISSN: 1864-6689 (online)

German Socio-Economic Panel (SOEP)
DIW Berlin
Mohrenstrasse 58
10117 Berlin, Germany

Contact: soeppapers@diw.de

Willingness to take risk: The role of risk conception and optimism*

Thomas Dohmen, Simone Quercia, and Jana Willrodt ☆

This version: March 11, 2019

We show that the disposition to focus on favorable or unfavorable outcomes of risky situations affects willingness to take risk as measured by the general risk question. We demonstrate that this disposition, which we call risk conception, is strongly associated with optimism, a stable facet of personality, and that it predicts real-life risk taking. The general risk question captures this disposition alongside pure risk preference. This likely contributes to the predictive power of the general risk question across domains. Our results also rationalize why risk taking is related to optimism.

Keywords: Risk taking behavior, optimism, preference measure, risk conception.
JEL classification: D91, C91, D81, D01

*We thank Robin Cubitt, Dirk Engelmann, Armin Falk, Felix Kuebler, and Zahra Murad as well the audience at the EEA-ESEM Cologne 2018 for helpful comments and suggestions. Funding by the Deutsche Forschungsgemeinschaft (DFG, German Research Foundation) through CRC TR 224 is gratefully acknowledged. Carina Lenze, Luis Wardenbach, Leon Sieverding and Maximilian Blesch provided excellent research assistance.

☆Dohmen: University of Bonn, Lennestrasse 43, 53113 Bonn, Germany; IZA Institute of Labor Economics; Maastricht University (tdohmen@uni-bonn.de); Quercia (corresponding author): University of Verona, Via Cantarane 24, 37129 Verona, Italy (simone.quercia@univr.it); Willrodt: Duesseldorf Institute for Competition Economics (DICE), Universitaetsstrasse 1, 40225 Duesseldorf, Germany (willrodt@dice.hhu.de)

1 Introduction

Most decisions in economic and social life are taken under risk or uncertainty. Expected utility theory posits that curvature of the utility function determines behavior in these situations; while non-expected utility theory allows for reference points and risk perception (e.g. probability weighting) to matter for risky choice. In this paper, we demonstrate that risk taking behavior is also determined by the disposition to focus on favorable or unfavorable outcomes of risky choice, an important factor beyond curvature of utility and deviations from linearity in probabilities. This disposition, which we call risk conception, is akin to a trait; it is strongly related to optimism, an enduring facet of personality (Carver and Scheier, 2014). We show that individuals differ systematically in the way how they conceive risky situations, and that these differences map into heterogeneity in risk taking behavior.

When it comes to predicting risky behavior across contexts, it is advantageous to have measures of all stable characteristics that determine risky choice, including risk conception. We argue that instruments and methods designed to reveal risk preference capture risk conception to different degrees. Typically these risk preference measures are based on a risky choice R that is a function of the underlying latent risk preference parameter r and a vector of other relevant factors X, i.e., $R = f(r, X)$. Standard practice in economics is to create environments and elicitation mechanisms that control for X as much as possible in order to elicit r (see Charness et al., 2013, for a review). A prime example is an incentivized lottery choice in a controlled environment. While such measures may be suited to reveal parameter r, their predictive power for real-life risk taking may be comparatively low precisely because of their tight control of other factors that systematically and persistently affect decision making under risk or uncertainty. In contrast, survey instruments that lack this control, e.g., with respect to stake size and probabilities, may capture these elements and have stronger predictive power for different risky behaviors R across situations.

We focus on one such instrument, the "general risk question", which asks subjects "Are you generally a person who is willing to take risks or do you try to avoid taking risks?" on an 11-point Likert scale ranging from "not at all willing to take risks" to "very willing to take risks". This question has been shown to predict risk taking behavior across different domains (e.g., Bonin et al., 2007; Caliendo et al., 2009; Grund and Sliwka, 2010; Jaeger et al., 2010; Dohmen et al., 2011; Lönnqvist et al., 2015).

We hypothesize that part of the variation in answers to the general risk question depends on respondents' disposition to focus on positive or negative outcomes of risk, and that this disposition is stable and systematic. Our experimental results support these hypotheses. We find that the degree to which respondents focus on the positive or negative outcomes of risk when answering the general risk question is a strong predictor of their responses. We further show that this disposition is sys-

tematically related to dispositional optimism, a stable character trait whose importance has been long recognized in personality psychology (e.g., Carver et al., 2010; Carver and Scheier, 2014).[1] Furthermore, we show that dispositional optimism affects responses to the general risk question but that it does so mostly through respondents' focus on the positive or negative outcomes of risk.

In light of this result, we use dispositional optimism as a proxy for people's disposition to focus on favorable/unfavorable outcomes of risk taking, and examine whether dispositional optimism relates to risk taking behavior. We do so using (i) an incentivized measure of risk taking contained in our experimental dataset and (ii) self-reported real-life behaviors from the German Socio-Economic Panel (henceforth SOEP). For both datasets, we find a significant association between risk taking behavior and dispositional optimism. Finally, we investigate the channels through which this association operates and show that risk conception and dispositional optimism are not related to probability weighting but rather to cognitive aspects related to focusing on the *outcomes* of risk. We conclude that, in addition to being a proxy for a latent risk preference parameter, the general risk question captures important personality characteristics relevant for risk taking behavior, thereby providing a broader representation of the factors that should be taken into account when studying decision making under risk.

The remainder of the paper is structured as follows. Section 2 explains our notion of risk conception and disentangles it from the perception of probabilities. Section 3 introduces the design of our experiment. Section 4 establishes the link between the way how people conceive risk, their responses to the general risk question, and dispositional optimism. Section 5 investigates the relationship between dispositional optimism, the general risk question and risk taking behavior, while Section 6 examines potential channels driving our results. Section 7 discusses the results and concludes.

2 Risk conception, dispositional optimism and probability weighting

In this paper we define *risk conception* as the disposition to focus on positive or negative outcomes of risky situations. Denote with $(L, l; p)$ a risky prospect that yields outcome L with probability p and outcome l with probability $1 - p$, where $L \succ l$ and $p \in (0, 1)$. According to our definition, individual differences in risk conception determine whether a person will be more inclined to focus on L or l. This in turn will have an effect on their willingness to take risk. Note that risk conception regards how people treat *outcomes* of risky prospects. This attentional disposition is reminiscent of the salience theory of choice under risk proposed by Bordalo et al.

[1] In line with much of the personality psychology literature (Carver et al., 2010), we view optimism as a stable disposition (i.e., a personality trait) that affects beliefs in specific environments. There is initial evidence that this character trait also manifests itself in differential beliefs about uncertain events (see Felton et al., 2003, who show that in males dispositional optimism increases investment in stocks).

(2012). Similarly to them and previous psychological research, we interpret focus or salience as "the phenomenon that when one's attention is differentially directed to one portion of the environment rather than to others, the information contained in that portion will receive disproportionate weighting in subsequent judgments (Taylor and Thompson, 1982)". In the theory of Bordalo et al. (2012), some lotteries are more salient than other lotteries in the choice set based on each lottery's outcomes, i.e., salience arises in the comparison of lotteries. Beyond this notion of salience, we postulate (i) that salience of outcomes need not to be only relative to other lotteries and (ii) that people will display heterogeneity in the degree to which they focus on the positive or negative outcomes of risky decisions.

We also conjecture that the general risk question captures this disposition better than other measures as it allows individuals to imagine any risky situation. Hence, risk conception will determine which risky situation people think about while answering the general risk question and which outcomes of risk (positive or negative) they attend to. We assume that risk conception is a stable characteristic akin to a trait, and hypothesize that it is correlated with dispositional optimism, an important dimension of personality. Carver and Scheier (2014) define dispositional optimism as "the expectation that one's own outcomes will generally be positive" and report evidence that "when optimists do think toward the future, they are able to generate more vivid mental images of positive events than are pessimists, a stronger sense of "pre-experiencing" those events (despite not having more vivid imaginations in general)". In this sense, dispositional optimism seems particularly related to our definition of risk conception. This personality dimension is typically measured using psychometric scales such as the Life Orientation Test (LOT) and SOP (see Section 3).[2] [3]

We distinguish risk conception from *risk perception*. We use the term risk perception to refer to models of decision making, in which agents evaluate known objective probabilities differently from taking them at face value such as prospect theory (Kahneman and Tversky, 1979) or models of rank-dependent utility (see, e.g., Quiggin, 1982). These models typically assume that decision making under risk can be formalized using a value function and a probability weighting function which transforms the objective probabilities (see, Prelec, 1988, for details on the proba-

[2] To the extent that risk conception is a direct consequence of optimism, risk conception can be viewed as an operationalization of the psychological trait "dispositional optimism". However, we do not view the two concepts as equal. Risk conception corresponds to a cognitive process of focusing on good or bad outcomes of risky situations, which is the cognitive manifestation of dispositional optimism but may be also affected by other factors.

[3] The idea that optimism may affect risk taking has been expressed both in the psychological and the behavioral finance literature. Overly optimistic beliefs about risky situations have been shown to affect decision-making in several domains, including health (Weinstein, 1982; Tennen and Affleck, 1987), the decision to become an entrepreneur (Cooper et al., 1988), or holding stocks (Puri and Robinson, 2007). However, direct evidence on the link between dispositional optimism and risk-taking is rather scarce. Felton et al. (2003) show that men (but not women) exhibiting higher dispositional optimism made riskier investment in a semester-long stock market game. Gibson and Sanbonmatsu (2004) find that optimists engage in more gambling in a laboratory experiment since (differently from pessimists) they do not reduce their betting after having experienced losses.

bility weighting function or Starmer, 2000, for a review of departures from EUT). The term optimism also appears in this literature. However, it is not used to refer to a personality trait but rather to characteristics of the probability weighting function. In particular, optimism is captured by the elevation of the probability weighting curve for prospects in the gains domain (see also Section 6.1). In extreme cases, a very high elevation leads to global overweighting of objective probabilities. This literature has typically measured optimism estimating probability weighting functions from certainty equivalents of risky lotteries (see, e.g., Bruhin et al., 2010). Hence, when we use the term risk perception we refer to the way how people perceive or evaluate *probabilities* of risky prospects.[4]

Despite the two concepts being theoretically distinct, with the former being related to outcomes and the latter to probabilities, it remains an empirical question whether dispositional optimism captures overweighting of probabilities, risk conception or both. Moreover, it is an empirical question whether risk conception matters for decision making under risk beyond probability weighting. We address both in the remainder of the paper.

3 The experiment

The data we analyze in this paper were collected during a longitudinal experiment consisting of three one-hour sessions run in three consecutive weeks. The experiment was computerized using z-Tree (Fischbacher, 2007). Participants were invited from the BonnEconLab subject pool using hroot (Bock et al., 2014). Most of the 348 participants were students (95%) from various fields of study. 61% of subjects were female, and the average age was 22.4 years. For a complete overview of all tasks we refer the reader to Table A.1 in the online appendix. In what follows, we describe the variables relevant to our research question.

General risk question. Our main variable of interest is the general risk question that was validated in Dohmen et al. (2011) (see also Section 1). We used the same wording as in the SOEP (see for example Goebel et al., 2018). The question was administered to subjects at the beginning of the session in each week.

Risk conception questions. Only in week 3 after subjects had responded to the general risk question, we asked them what aspects of risk they focused on while answering it.[5] We use the following four questions (7-point Likert scale).[6]

- Did you rather think of the negative or positive sides of risk? [Risk - neg/pos; scale: "[1] only of the negative sides" to "[7] only of the positive sides"]

[4] Probability weights are sometimes interpreted as reflecting misperception of objective probabilities, and sometimes as subjective probabilities (see, e.g., Wakker, 2010).

[5] The risk conception questions were only asked in week 3 to avoid that responses to the general risk question would be distorted by asking the risk conception questions before and thereby potentially priming respondents.

[6] All questions are translated from German.

- Did you rather think of small everyday situations or large important ones? [Risk - stake size; scale: "[1] small everyday situations" to "[7] large important situations"]
- Did you rather think of situations in which there are small or large gains? [Risk - stake size (gains); scale: "[1] small gains" to "[7] large gains"]
- Did you rather think of situations in which there are small or large losses? [Risk - stake size (losses); scale: "[1] small losses" to "[7] large losses"]

Before responding to these questions, subjects reported in free-form text what they thought of when answering the general risk question. To code the free-form text, we used the following procedure: two research assistants independently coded the free-form answers on four scales along the dimensions of positive/negative valence and stake size (see Section A.3 in the online appendix for details on the coding procedure). For each dimension, we average between the two RAs' codings (see Brandts and Cooper, 2007, for a similar approach). Spearman rank correlations between the resulting variables and the corresponding risk conception questions are $\rho = .39$ for "Free form - neg/pos"($p < .001$) and "Risk - neg/pos", $\rho = .42$ for "Free form - stake size" and "Risk - stake size" ($p < .001$), $\rho = .14$ for "Free form - stake size (gains)" and "Risk - stake size (gains)" ($p = .007$), and $\rho = .14$ for "Free form - stake size (losses)" and "Risk - stake size (losses)" ($p = .011$).[7]

Measures of dispositional optimism. Our main measure is the German version of the so-called SOP questionnaire introduced and validated as an appropriate measure of dispositional optimism by Kemper et al. (2015). It consists of two items eliciting self-reported degrees of optimism and pessimism (7-point Likert scale). The first item is: "Optimists are people who look to the future with confidence and who mostly expect good things to happen. How would you describe yourself? How optimistic are you in general?". The second item reads as "Pessimists are people who are full of doubt when they look to the future and who mostly expect bad things to happen. How would you describe yourself? How pessimistic are you in general?".

The SOP scale was developed as an ultra-short version of the established (revised) Life Orientation Test (henceforth LOT; Scheier et al., 1994; Herzberg et al., 2006), which we also include in our questionnaire. Similar to Kemper et al. (2015), we find a convergent Spearman rank correlation between SOP and LOT of $\rho = .76$ ($p < .001$). In the main text of the paper, we restrict our analyses to the SOP measure, but results are virtually the same if LOT is used (see Section A.5 and Section A.10 in the online appendix for the LOT questionnaire and these results, respectively).

[7] Some free-form text answers were not classifiable according to our categories. This is especially prominent for the three variables referring to stake size where 50%, 56%, and 62%, respectively, of coded answers take the value 0, compared to 42% for "Free form - neg/pos" (see Table A.3.) This suggests that subjects display heterogeneity in whether they focus on the positive negative sides of risk rather than in thinking of different stake sizes.

Dispositional optimism was elicited at the end of the session in the third week, after subjects had completed several incentivized tasks without having received feedback. This makes spillover effects between the risk-related questions and the optimism measures unlikely. We also elicited SOP and LOT in the second week of our longitudinal experiment. The Spearman rank correlation of measured optimism across weeks is $\rho = .81$ for SOP and $\rho = .84$ for LOT (Spearman, $p < .001$ for both). All the results presented in the paper are robust to using these previously elicited optimism measures (see Section A.10 in the online appendix).

Risk taking behavior. Our behavioral risk measure is based on the risk premia for three different lotteries. We elicited certainty equivalents of these lotteries in week 1 and week 3 using a multiple price list format. In both weeks, subjects went through the same three choice lists (see Section A.6 in the online appendix). In all tables, subjects chose between a safe payment and a lottery paying 15 € with probability p and 0 € with probability $1 - p$. The probability p was 0.25, 0.5, and 0.75 in tables 1, 2, and 3, respectively. The safe payment increased from 0 € to 15 € in steps of 0.50 €. For each lottery, we average over the risk premia across weeks to reduce noise in our measure of risk taking. Furthermore, we construct a risk premium index aggregating the risk premia for the three lotteries for each subject.

Controls. We control for sociodemographics that were elicited in the first week of the experiment and a proxy for cognitive ability that was elicited in the third week. This proxy is based on ten Raven matrices (see Section A.7 of the online appendix for the distribution of responses). In addition, in some specifications we also use the Big Five personality characteristics that we elicited in every session using the 15 item questionnaire developed for the SOEP (Schupp and Gerlitz, 2008).

4 Conception of risk and the general risk question

There are two noteworthy patterns in our data. First, there is considerable heterogeneity in answers to risk conception questions, as is reflected by standard deviations in responses. Averages and standard deviations are 3.53 and 1.43, respectively, for “Risk - neg/pos”; 4.06 and 1.56 for “Risk - stake size”; 4.18 and 1.51 for “Risk - stake size (gains)”; as well as 4.49 and 1.58 for “Risk - stake size (losses)”. The correlational pattern between the different risk conception questions suggests that valence and stake size are orthogonal, as “Risk - neg/pos” and “Risk - stake size” are uncorrelated (Spearman’s $\rho = -.071$, $p = .185$), while all other risk conception questions are significantly correlated with one another (see Table A.2 in the online appendix for details). Second, pairwise Spearman rank correlations between the general risk question and each of the conception questions are significantly different from zero except for "Risk - stake size".[8]

[8] The correlations are $\rho = 0.63$ and $p < .001$ for “Risk - neg/pos”,$\rho = -.04$ and $p = .488$ for “Risk - stake size”, $\rho = .27$ and $p < .001$ for “Risk - stake size (gains)”, $\rho = -.28$ and $p < .001$ for “Risk - stake size (losses)”.

	General risk question					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk - neg/pos	0.538***	0.620***				
	(0.046)	(0.042)				
Risk - stake size	0.083*		-0.013			
	(0.046)		(0.053)			
Risk - stake size (gains)	0.100**			0.255***		
	(0.044)			(0.052)		
Risk - stake size (losses)	-0.189***				-0.302***	
	(0.048)				(0.051)	
Female	-0.136	-0.142	-0.284**	-0.231**	-0.283***	-0.283**
	(0.085)	(0.087)	(0.110)	(0.107)	(0.105)	(0.110)
Cognitive Ability (Raven)	-0.135***	-0.115***	-0.117**	-0.121**	-0.150***	-0.117**
	(0.041)	(0.042)	(0.054)	(0.052)	(0.051)	(0.054)
Constant	0.084	0.0875	0.175**	0.142*	0.174**	0.174**
	(0.066)	(0.067)	(0.086)	(0.083)	(0.082)	(0.086)
R^2	0.44	0.41	0.03	0.09	0.12	0.03
N	348	348	348	348	348	348

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized. The independent variables "Risk - neg/pos" to "Risk - stake size (losses)" consist of the answers to questions eliciting what subjects thought of while answering the general risk question along the dimensions of valence and stake size.

Table 1. Relationship between the general risk question and risk conception.

Ordinary least squares regressions confirm that answers to the risk conception questions are systematically related to responses to the general risk question, even when controlling for gender and cognitive ability. [9] Column (1) of Table 1 indicates that subjects who focus on positive rather than negative sides of risk are significantly more willing to take risk. The effect sizes of all other risk conception questions are smaller. Thinking about higher gains is associated with a significantly higher willingness to take risk and thinking about higher losses with a significantly lower willingness to take risk.[10]

Whether subjects focus on the positive or negative aspects of risk also has by far the highest explanatory power. This is evident from comparing the R^2 of the regressions in models (2) to (5), in which we successively regress the general risk question on one of the risk conception questions and the set of control variables ($R^2 = 0.44$ and $R^2 = 0.41$ for models (1) and (2), respectively, and $R^2 = 0.03$, $R^2 = 0.09$ and $R^2 = 0.12$, respectively, for models (3) to (5)). In summary, this indicates that conception of risk is strongly related to self-assessed willingness to take risk.

Table 1 also reveals an interesting finding regarding the gender effect in willingness to take risk. Not controlling for risk conception, women report to be significantly less willing to take risk than men (model (6)). This is consistent with the

[9] We do not control for age since there is very little variation in a student sample.

[10] We use ordinary least squares regressions throughout the paper for their ease of interpretation. We report simple probit or ordered probit regressions for all models which contain an ordinal dependent variable in Section A.9 in the online appendix. All results are robust to these alternative models

	Risk - neg/pos	Risk - stake size	Risk - stake size (gains)	Risk - stake size (losses)
	(1)	(2)	(3)	(4)
Optimism (SOP)	0.223***	-0.015	0.030	-0.138***
	(0.052)	(0.054)	(0.054)	(0.053)
Female	-0.220**	-0.048	-0.204*	-0.003
	(0.108)	(0.111)	(0.111)	(0.110)
Cognitive Ability (Raven)	-0.009	-0.035	0.018	-0.108**
	(0.053)	(0.054)	(0.054)	(0.054)
Constant	0.135	0.030	0.125	0.002
	(0.084)	(0.087)	(0.087)	(0.086)
R^2	0.06	0.00	0.01	0.03
N	348	348	348	348

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized. The dependent variables consist of the answers to questions eliciting what subjects thought of while answering the general risk question along the dimensions of valence and stake size.

Table 2. Relationship between risk conception and dispositional optimism.

gender difference in willingness to take risk reported in many previous studies using representative population samples of particular countries (e.g., Dohmen et al., 2011) and across the globe (Falk et al., 2018) as well as in various non-representative population studies (Vieider et al., 2015).[11] However, once we condition on whether respondents think about positive or negative aspects of risk when answering the general risk question, the gender difference becomes small and insignificant (models (1) and (2)). This indicates that the gender difference in self-assessed willingness to take risk is largely driven by gender differences in the disposition to focus on positive or negative outcomes of risk taking, and not so much by gender differences in the curvature of the utility function.

Our findings are corroborated when we measure risk conception in an alternative way, using the variables constructed from the free-form text question that was elicited before the risk conception questions (see Section 3 for details on variable construction).[12] When we replicate the regressions reported in Table 1 using variables derived from free-form text, we find qualitatively very similar results (see Table A.4 in the online appendix).

As a next step, we investigate to what extent risk conception is systematically related to stable individual characteristics. For this purpose, we regress answers to the four questions described in Section 3 on the optimism measure (SOP), our main proxy for personality characteristics, controlling for gender and cognitive ability. The results are shown in Table 2. The coefficient associated with dispositional op-

[11] For reviews and meta-studies see Eckel and Grossman (2008), Croson and Gneezy (2009), Charness and Gneezy (2012), and Buser et al. (2014).

[12] The Spearman rank correlation between the general risk question and "Free form - neg/pos" is positive and significant ($\rho = .265$, $p < .001$), while this is not the case for "Free form - stake size"($\rho = -.024$, $p = .652$),"Free form - stake size (gains)"($\rho = -.003$, $p = .949$) and "Free form - stake size (losses)"($\rho = .043$, $p = .420$).

timism is significantly different from zero only for the regressions using "Risk - neg/pos" and "Risk - stake size (losses)", which were also the strongest predictors of answers to the general risk question.

In line with the findings from Table 1, women exhibit a significantly lower propensity to think of the positive rather than the negative sides of risk, even when dispositional optimism is not controlled for (see Table A.7 in the online appendix). This supports the conjecture that gender differences in risk taking are partly due to systematic gender differences in risk conception.

The data enable us to perform a number of robustness checks on the relationship between risk conception and dispositional optimism (see Table A.15 to Table A.18 in the online appendix). A potential concern is that measurement error in optimism might be correlated with answers to the risk conception questions. For example, subjects' momentary psychological state might affect the optimism measure and answers to the risk conception questions, and hence introduce a spurious relationship between the measures, which does not reflect a relationship between the trait component of dispositional optimism and risk conception. We address this in several ways. First, we regress the answers to the risk conception questions on self-stated mood elicited at the beginning of the session (see model (5) in each of the aforementioned tables). Additionally, we regress the answers to the four risk conception questions on the optimism measures elicited one week prior to asking the risk conception questions (see model (2) in each of the aforementioned tables). Further, to correct for measurement error in the optimism measure we (i) aggregate the SOP measures elicited in week 2 and 3 and (ii) we instrument SOP elicited in week 3 with SOP elicited in week 2 using a two stage least squares estimation (see models (3) and (4) of each table). Finally, to validate the importance of dispositional optimism as a relevant personality characteristic in our context, we run the same specifications of models (3) and (4) adding the Big Five personality traits also corrected for measurement error (see models (6) and (7) of each table).[13] Similar to the results in Table 2, the coefficient associated with optimism is significantly different from zero across all additional specifications when we use "Risk - neg/pos" and "Risk - stake size (losses)" as dependent variables, while it is not for the other two risk conception variables.

Since our hypothesis is that dispositional optimism is a reliable proxy (and might be causal) for people's disposition to focus on favorable/unfavorable outcomes of risk taking, which in turn affects responses to the general risk question, we next study whether optimism has a direct effect on measured risk attitudes and how risk conception mediates this relationship.

[13] In personality psychology, dispositional optimism is viewed as a distinct trait that cannot be readily mapped into the Big Five inventory, even though there is a partial overlap between dispositional optimism and some dimensions of the Big Five (in particular agreeableness and extraversion; see Carver and Scheier (2014)). In our setup, optimism seems ex-ante an aspect of personality that can be used as a reliable proxy people's disposition to focus on favorable or unfavorable outcomes of risk taking. The models reported in Table A.15 to Table A.18 confirm this.

	General risk question					
	(1)	(2)	(3)	(4)	(5)	(6)
Optimism (SOP)	0.226***	0.083**	0.092**	0.226***	0.219***	0.188***
	(0.052)	(0.042)	(0.042)	(0.052)	(0.050)	(0.050)
Risk - neg/pos		0.521***	0.599***			
		(0.046)	(0.043)			
Risk - stake size		0.079*		-0.010		
		(0.046)		(0.052)		
Risk - stake size (gains)		0.103**			0.249***	
		(0.044)			(0.050)	
Risk - stake size (losses)		-0.181***				-0.276***
		(0.048)				(0.050)
Female	-0.276**	-0.137	-0.144*	-0.276**	-0.225**	-0.276***
	(0.107)	(0.084)	(0.086)	(0.107)	(0.104)	(0.103)
Cognitive Ability (Raven)	-0.123**	-0.137***	-0.118***	-0.124**	-0.128**	-0.153***
	(0.052)	(0.041)	(0.042)	(0.052)	(0.050)	(0.050)
Constant	0.170**	0.084	0.088	0.170**	0.138*	0.170**
	(0.084)	(0.066)	(0.067)	(0.084)	(0.081)	(0.080)
R^2	0.08	0.45	0.42	0.08	0.14	0.15
N	348	348	348	348	348	348

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized.

Table 3. Relationship between the general risk question and dispositional optimism controlling for risk conception.

In Table 3 we regress the general risk question on the SOP optimism measure. When we only include SOP and controls as explanatory variables (model (1)), the coefficient on the optimism measure is sizable and significantly different from zero. However, once the question on whether subjects thought about the positive or negative sides of risk is added to the regression, the coefficient on the optimism measure decreases considerably (model (2) and (3)). This pattern is weaker or non-existent for the other risk conception questions (models (4) to (6)).

The coefficient on "Risk - neg/pos" in models (2) and (3) is significantly different from zero and of the same order of magnitude as in Table 1, when the optimism measure was not included. This suggests that it is not dispositional optimism itself but rather its influence on subjects' conception of the general risk question, in terms of positive or negative outcomes of risk taking, that affects stated risk attitudes.

5 Dispositional optimism and risk taking behavior

So far, we have shown that responses to the general risk question are affected by aspects beyond parameters of a standard utility function. In fact, one crucial aspect is whether people have a disposition to focus on the positive or negative outcomes of risk taking. This disposition has persistence as it is related to dispositional optimism, an important and stable character trait. An intriguing question that extends

beyond the relationship between risk conception and self-assessed willingness to take risk is whether actual risk taking behavior is also affected by risk conception. If this was not the case, answers to the general risk question would simply contain information irrelevant for risky behavior.[14]

Below, we analyze data from our experiment and from a representative sample, and show that this disposition to focus on positive/negative outcomes of risk, proxied by dispositional optimism, is in fact related to risk taking behavior.[15] As a measure of risk taking behavior among our student sample, we use the risk premium index derived from three incentivized lottery choices (see Section 3). We regress this index on the SOP optimism measure, the general risk question, and basic control variables. Model (1) in Table 4 shows a significant association between risk taking behavior and the optimism measure. Model (2) replicates findings from the previous literature and shows that the general risk question is a significant predictor of risk taking in lottery choice. When we include both the optimism measure and the general risk question in the regression (model (3)), the coefficient on the optimism measure is smaller and not statistically significant. This indicates that the general risk question captures the optimism component, thus making it a useful predictor for risk taking behavior. A similar pattern arises when using each risk premium separately rather than the risk premium index as a dependent variable (see Table A.22 and Table A.23 in the online appendix).

Next, we investigate whether the association between dispositional optimism and risk taking behavior extends to real-life behavior in a representative sample of the German population. For this purpose we use information on self-reported behaviors in the 2014 wave of the German Socio-Economic Panel (SOEP). In particular, we focus on two domains that are relevant for economics and directly related to risk taking: portfolio choice and career choice. As a proxy for portfolio choice, we use information about household stock holdings. The variable "Stocks" takes value 1 if at least one household member holds stocks, shares, or stock options and zero otherwise. Since the question is only administered to the household head, the regressions involving this variable use the subsample of household heads. The variable “Self-employed” takes value 1 if an individual is self-employed and zero for individuals who are in other employment. As a proxy for dispositional optimism we use the following question: “If you think about the future: Are you...?”(translated from German). Respondents could answer on a scale from 1 to 4, where 1 = “optimistic”, 2 = “rather optimistic than pessimistic”, 3 = “rather pessimistic than optimistic", and 4 = “pessimistic”. For ease of interpretation, we reverse the scale, such that, a higher scores means higher optimism. The general risk question has the exact same wording as in our experiment. We standardize both variables to ensure

[14] Such information unrelated to risk taking behavior would generate measurement error in responses to the general risk question lowering its predictive power (Beauchamp et al., 2017).

[15] We rely on optimism as a proxy for risk conception in both samples to ensure comparability between them. For the data from our experiment a more direct test of the relationship between risk conception and risk-taking behavior using the measure “Risk - neg/pos” is also possible and yields virtually identical results (see Table A.24).

	Risk premium index		
	(1)	(2)	(3)
Optimism (SOP)	-0.118**		-0.068
	(0.050)		(0.050)
General risk question		-0.237***	-0.221***
		(0.049)	(0.051)
Female	0.431***	0.368***	0.370***
	(0.103)	(0.102)	(0.102)
Cognitive Ability (Raven)	0.016	-0.015	-0.011
	(0.050)	(0.049)	(0.049)
Constant	-0.248***	-0.209***	-0.211***
	(0.081)	(0.079)	(0.079)
R^2	0.064	0.108	0.113
N	348	348	348

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. The variable "risk premium index" is created by standardizing the risk premia (aggregated over measurements in week 1 and 3), averaging, and then standardizing again. All independent variables except "Female" are standardized.

Table 4. Dispositional optimism and Risk Taking Behavior.

comparability. As expected from our experimental data, the correlation between the willingness to take risk as measured by the general risk question and the optimism measure is positive and significant (Spearman rank correlation: $\rho = .165$, $p < .0001$).

To investigate whether dispositional optimism is also predictive of real-life risk taking we run a series of linear probability models reported in Table 5 where we regress the aforementioned measures of risk taking on the optimism measure, the general risk question, and a set of control variables.[16] In line with the results from our experiment, models (1) and (4) show that the optimism measure is significantly related to both holding stocks and being self-employed. In particular, an increase by one standard deviation in the response to the optimism question is associated with an increase in the probability of holding stocks (being self-employed) of 1.2 (1.2) percentage points.

Likewise the general risk question (models (2) and (5)) is significantly related to holding stocks and being self-employed. We find that an increase by one standard deviation in willingness to take risk is associated with a 1.9 (3.2) percentage

[16] We control for gender, age, and height, which have been shown to be related to risk taking in the previous literature (Dohmen et al., 2011) We also control for parents' education (*Abitur* mother and *Abitur* father) rather than own education to avoid reverse causality problems. These variables are equal to 1 if a parent has "Abitur" or "Fachabitur", high school degrees that are awarded after 12 or 13 years of schooling and that grant access to (specific types of) university education. Further controls are logarithmic household wealth, logarithmic household debt, and logarithmic net household income. We also control for the number of adults (defined as older than 17) in the household in the stock-holding regression.

points higher probability of holding stocks (being self-employed). These results are consistent with Dohmen et al. (2011), who find similar effects for the 2004 wave of SOEP.

Finally, when we include both the optimism measure and the general risk question (models (3) and (6)), the coefficients on optimism are reduced, similar to the regressions reported in Table 4, indicating that the general risk question is also partly capturing the optimism component.

	Risk taking: Stocks			Risk taking: Self-employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Std. Optimism	0.012***		0.009**	0.012***		0.007**
	(0.004)		(0.004)	(0.003)		(0.003)
Std. General risk question		0.019***	0.017***		0.032***	0.031***
		(0.004)	(0.004)		(0.004)	(0.004)
Female	0.008	0.011	0.011	-0.021**	-0.012	-0.013
	(0.012)	(0.012)	(0.012)	(0.009)	(0.009)	(0.009)
Age	0.001**	0.001**	0.001***	0.004***	0.004***	0.004***
	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)	(0.0003)
Height	0.002***	0.002**	0.002**	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.0005)	(0.0005)	(0.0005)
Abitur mother	-0.030*	-0.028	-0.031*	0.055***	0.051***	0.053***
	(0.018)	(0.018)	(0.018)	(0.013)	(0.013)	(0.013)
Abitur father	0.076***	0.076***	0.077***	0.037***	0.042***	0.040***
	(0.014)	(0.014)	(0.014)	(0.010)	(0.010)	(0.010)
Log househ. wealth	0.011***	0.012***	0.012***	0.003***	0.003***	0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log househ. debt	-0.006***	-0.006***	-0.006***	0.001	0.001	0.001
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Log net househ. income	0.205***	0.203***	0.203***	0.001	0.002	0.001
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Number of adults in hh	-0.046***	-0.045***	-0.044***			
	(0.007)	(0.007)	(0.007)			
Constant	-1.675***	-1.663***	-1.648***	-0.189*	-0.212*	-0.199*
	(0.134)	(0.134)	(0.135)	(0.109)	(0.108)	(0.109)
R^2	0.138	0.138	0.139	0.032	0.041	0.041
N	9,324	9,325	9,267	8,593	8,573	8,537

Notes. OLS regressions. Standard errors in parentheses. $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. The samples in columns 1 to 3 include only household heads. The dependent variable takes a value of 1 if the household holds stocks and 0 otherwise. The dependent variable in columns 4 to 6 takes a value of 1 if the respondent is self-employed and 0 otherwise. Here, we limit the sample to individuals under 66 years who are part of the labor force.

Table 5. Relationship between risk taking behavior and dispositional optimism.

In sum, we have shown that responses to the general risk question are influenced by how people conceive risk, that is, whether they tend to focus on good or bad outcomes when answering the question. This tendency is systematic and it is related to dispositional optimism, a stable character trait. Finally, we have shown that dispositional optimism is strongly correlated with risk taking behavior both in a student sample and in a representative sample. Our next step is to identify the channels through which this relation operates.

6 Channels

We conjecture two main underlying channels through which the association between the general risk question, risk conception and optimism may operate. The first identifies risk conception as a character trait that determines whether people focus on good or bad *outcomes* of risk. This mechanism is independent of how people perceive and evaluate probabilities. Under this interpretation, dispositional optimism as measured by psychometric scales (SOP and LOT) is a good proxy for this disposition and should also be related to cognitive processes related to attention and focusing.

A rather different channel may be that what we interpret as risk conception is in fact a manifestation of how people evaluate *probabilities*, that is, risk perception. Within a long standing literature on prospect theory (see Wakker, 2010), the term "optimism" is typically used to indicate either global overweighting of objective probabilities or, in case of inverse S-shaped probability weighting function, the elevation of the probability weighting function. Hence, whether people focus on positive or negative aspects of risk when answering the general risk question may be determined by their perception (weighting) of objective probabilities. Under this conjecture, dispositional optimism as measured by SOP could also be a manifestation of probability weighting rather than being distinct from it.

To test for these possibilities, we conduct an additional experiment, to which we invited 182 participants for a 1-hour experimental session. Participants were recruited from the BonnEconLab subject pool via hroot (Bock et al., 2014) and earned on average 14.90 €. In this additional experiment, we elicited the same measures reported in our first experiment, namely, the general risk question, the risk conception questions, measures of dispositional optimism (SOP and LOT), and the choice list tables. Furthermore, we elicited two additional sets of measures, one for each proposed channel. The first relates to probability weighting and the second to focusing and attentional processes.

6.1 Risk conception and probability weighting

To investigate the relation between the general risk question, risk conception and probability weighting, we estimate probability weighting functions at the individual level using a series of choice list tables adapted from Fehr-Duda et al. (2006).[17] The procedure requires each subject to complete 25 tables. Each table consists of 20 rows, where each row is a choice between a lottery and a safe payment, with the safe payment decreasing from the high outcome to the low outcome of the lottery in equal increments moving down the rows (see Table A.25 in the online appendix for a summary of the parametrization). We use the switching point from choos-

[17] See also Bruhin et al. (2010), Epper et al. (2011), and Murad et al. (2016) for applications of the same elicitation procedure. In particular, the tables and the estimation procedures we use are a one-to-one replication of Murad et al. (2016). We thank the authors for providing their instructions and estimation code.

ing the guaranteed amount to the lottery as our estimate of the subject's certainty equivalent for the lottery. Hence, we can write the equivalence relation between the safe payment and lottery L as:

$$U(CE_L) = U(x_{1L})w(p_{1L}) + U(x_{2L})(1 - w(p_{1L}))$$

where x_{1L}, p_{1L}, x_{2L}, and p_{2L} indicate the low outcome, its probability, the high outcome, and its probability, respectively. In order to estimate $U(\cdot)$ and $w(\cdot)$, we specify functional forms as in Bruhin et al. (2010) and Murad et al. (2016) by assuming a simple CRRA power utility function:

$$U(x) = x^{\alpha}.$$

This specification is parsimonious in modelling risk attitudes via a single curvature parameter.

Regarding the probability weighting function we assume the linear-in-log-odds function proposed by Goldstein and Einhorn (1987) and Lattimore et al. (1992):

$$w(p) = \frac{\delta p^{\gamma}}{\delta p^{\gamma} + (1-p)^{\gamma}}.$$

The advantage of this specification is that the two parameters have a clear interpretation: the δ parameter captures the *elevation* of the probability weighting function, while γ captures its *curvature*. Hence, δ reflects to what extent subjects overweight probabilities and can be considered a measure of optimism in probability weighting (see, e.g., Lattimore et al., 1992; Bruhin et al., 2010).[18]

We derive individual risk attitudes parameters (curvature of utility and probability weighting function) under rank-dependent utility (RDU) theory through a maximum likelihood estimation. The estimation converges for all but one subject. Of the remaining 181 subjects 164 exhibit an inverse S-shaped weighting function, while 10 have globally convex weighting functions, and 2 subjects have a globally concave and a S-shaped weighting function, respectively. Only for 5 subjects in our sample the estimated parameters (δ and γ) are consistent with expected utility theory, i.e., not significantly different from 1. The distributions of the estimated δ, γ, and α parameters are reported in the online appendix in Figure A.3.

As a first step of our analysis, we assess whether we can replicate the results of our main experiment. Columns (1) and (2) of Table 6 display the regressions of the general risk question on "Risk - neg/pos" and SOP, respectively, including controls. Coefficients are similar to those estimated on the data of our main experiment (compare to Table 1, column (2), and Table 3, column (1)). Moreover, similar to the main experiment, the coefficient on the measure of dispositional optimism roughly halves when "Risk - neg/pos" is added to the regression (Table 6, column

[18] We also assume that the observed switching point is equivalent to the "true" certainty equivalent plus a normal *i.i.d.* error term and we account for heteroskedasticity in the variance of the error term across tables as in Epper et al. (2011) and Murad et al. (2016).

	General risk question				
	(1)	(2)	(3)	(4)	(5)
Risk - neg/pos	0.516***		0.493***		
	(0.065)		(0.066)		
Optimism (SOP)		0.210***	0.101		0.190**
		(0.074)	(0.066)		(0.075)
δ				0.125	0.092
				(0.076)	(0.076)
Female	0.011	-0.103	0.031	-0.082	-0.048
	(0.132)	(0.149)	(0.132)	(0.156)	(0.154)
IQ (Raven)	-0.105	-0.106	-0.095	-0.122*	-0.103
	(0.064)	(0.073)	(0.064)	(0.074)	(0.073)
Constant	-0.006	0.061	-0.018	0.042	0.023
	(0.101)	(0.114)	(0.101)	(0.118)	(0.117)
R^2	0.28	0.06	0.29	0.03	0.07
N	182	182	182	181	181

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized. δ is the standardized elevation parameter of the estimated weighting function.

Table 6. Relationship between the general risk question, risk conception, optimism, and probability weighting.

(3); compare to Table 3, column (3)). We conclude that our results from the main experiment are robust and replicable.[19]

Next, we use the estimated individual δ parameter to assess the relation between probability weighting and the general risk question. As described above the δ parameter governs the elevation of the weighting curve and a high δ can be generally interpreted as reflecting optimistic probability weighting (see, e.g., Bruhin et al., 2010). Column (4) of Table 6 displays the regression of the general risk question on δ and controls. Despite the sign being in the right direction, the coefficient is not significant, indicating low explanatory power of the δ parameter for the general risk question. When we add SOP in column (5), both coefficients are comparable in size to the regressions where we included each variable separately. This indicates that each regressor has a separate role in explaining responses to the general risk question corresponding to different underlying characteristics. Moreover, the SOP coefficient remains significant despite the addition of δ as additional explanatory variable.

These results confirm that dispositional optimism plays an important role in the responses to the general risk question independently of probability weighting, whose role seems to be minor.

[19] All other main findings as presented in Table 1 to Table 4 are also replicated in this data set (see Section A.11 in the online appendix).

6.2 Risk conception and focusing

If dispositional optimism determines whether people focus on good or bad outcomes of risk, we should expect our measure of dispositional optimism (SOP) to be related to process data regarding attention and focusing on good or bad *outcomes* in risky environments. To test whether this is the case, we implemented three novel tasks in the additional experiment.

The first task is designed to capture *selective information acquisition* regarding the outcomes of a lottery. In this task, subjects are asked to decide between a safe payoff of 11 € and a two-outcome lottery with equal probabilities $(L, l; 0.5)$. The lottery *outcomes* are, however, initially unknown. Subjects are only informed that one is higher and the other lower than the safe payoff. Before choosing between the lottery and the safe payoff, they decide which of the lottery outcomes to reveal. They are explicitly told that they can only reveal one of the two outcomes. They then make the choice between the lottery and the safe payoff knowing just one of the two lottery outcomes. In the experiment, 45% of subjects choose to reveal the low outcome, and the remaining 55% choose to see the high outcome. Our measure of selective information acquisition is simply whether subjects choose to reveal the high or low outcome.

The second task measures *selective attention* in a setup where subjects have complete information about the risky environment. Subjects again decide between a lottery with equal probabilities assigned to each of two outcomes and a safe payoff. The payoffs of the lottery are initially not displayed and hidden behind gray boxes on the screen. Subjects can see each outcome when they move the mouse on the respective box. As soon as the mouse leaves the box, the outcome disappears again. They can move the mouse on both outcomes as long and as often as they like. On average subjects locate their mouse on the box containing the high outcome significantly more often than on the one containing the low outcome (3.4 times vs. 2.5 times, Wilcoxon signed rank test: $p < .0001$). As a measure of selective attention, we compute the difference between the number of times the high outcome and the low outcome are viewed.

The third task we introduce refers a more automatic process: *memory*. During the experiment, participants read two short vignettes where a risky choice is made. For one of the vignettes a good, for the other a bad outcome arises. Both the order and the outcomes of the vignettes are balanced across subjects (see Section A.11.1 for the text of the vignettes and further details). In an online survey that subjects completed one week after the experiment, we asked them to state which of the vignettes comes to their mind first.[20] They answer this question in a free form text

[20] We frame the online survey as part of the experiment. To incentivize participation, we distributed at the end of the lab session one lottery ticket which is valid only if the corresponding participant fills in the online survey. The lottery prize is 50 EUR. Due to this mechanism, attrition is very low (178 subjects out of 182 complete the online survey). To track subjects while still preserving anonymity we used subject IDs that could not be traced to subjects' names to match their responses across weeks. Of the 178 participants, 175 could unequivocally be matched with the data from the laboratory.

first and then as a binary choice between the general topics of the two vignettes (see Section A.11.1). Although reading the vignettes was not incentivized, we are confident that subjects actually read the texts since they spent on average 43 (39) seconds on the first (second) vignette and no one spent less than 21 (15) seconds. According to the free-form text measure 36% of subjects recall the vignette with the negative outcome, and 37% of subjects recall the vignette with the positive outcome. The others state they do not remember or give unclear answers. In the binary measure recall of the two vignettes is also evenly distributed between the vignette with the positive and that with the negative outcome (50% each). Our measure of memory is whether subjects remember the vignette where the good or the bad outcome arises.[21]

In Table 7, we regress the measures derived from the three tasks above on our measure of dispositional optimism (SOP) controlling for other observable individual characteristics.

While our measure of selective information acquisition derived from the first task does not seem to be significantly related to dispositional optimism despite having the expected sign (see Table 7 column (1)), both selective attention and memory are significantly correlated with SOP (see Table 7 columns (2) and (3)). These results indicate that SOP is related to at least some of the hypothesized attention and focusing processes. This further strengthens our interpretation that risk conception, i.e., attention to outcomes, is related to dispositional optimism.

In Section 5, we have shown that dispositional optimism explains subjects' risky choices in choice list tables and in real-life behavior. Here, we can move a step further and, having established that optimism is associated with focusing, we can check whether focusing in turn explains risky choices within the same risky task. We do so observing the choices people actually make in our first and second tasks. In the first task, subjects choosing to reveal the low outcome are more likely to choose the safe option than those who choose to reveal the high outcome (91% vs. 72%, Wilcoxon rank-sum test: $p = .0009$). Consistently, in the second task the more often subjects look at high outcome relative to low outcome, the less likely they are to choose the safe payoff (Pearson correlation coefficient: $r = -.198$, $p = .007$). These results indicate that dispositional optimism has an indirect effect on risk taking via focusing on the good or bad outcome of the lottery, similar to the one hypothesized for the general risk question and reported in Table 4 and Table 5.

7 Conclusion

In this paper, we have provided evidence that responses to the general risk question (Dohmen et al., 2011) are influenced by factors beyond curvature of a standard

[21] Another possible way to investigate this mechanism rather than looking at process data would have been to use priming techniques to show that if people are primed with positive outcomes they tend to take more risk than when primed with negative outcomes. Evidence along this lines is offered by Cohn et al. (2015) who show that financial professionals primed with a stock market boom tend to take more risk than the ones primed with a bust.

	Selective information: Reveal higher outcome (1)	Attention: Longer time on higher outcome (2)	Memory: Remember good outcome (3)
Optimism (SOP)	0.014	0.181**	0.132*
	(0.037)	(0.088)	(0.076)
Female	-0.097	-0.118	0.054
	(0.075)	(0.178)	(0.156)
Cognitive Ability (Raven)	-0.117***	-0.097	0.076
	(0.037)	(0.087)	(0.076)
Constant	1.607***	0.971***	-0.025
	(0.057)	(0.136)	(0.119)
R^2	0.06	0.04	0.02
N	182	182	175

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All independent variables except "Female" are standardized.

Table 7. Relationship between the different focusing tasks, dispositional optimism and probability weighting.

utility function and the shape of the probability weighting function. The way how people conceive risk and in particular whether they have a tendency to focus on favorable or unfavorable outcomes of risk taking is a crucial determinant of their responses. We have shown that heterogeneity in this disposition is systematic as it is related to dispositional optimism, a stable character trait. While optimists tend to focus on the positive outcomes associated with risk, pessimists tend to focus on the potential negative outcomes of risky decisions, leading to divergent responses. Similar associations are found in our second experiment when we have investigated different cognitive aspects of focusing. Optimists tend to be more attentive and remember more good than bad outcomes of risky situations.

Our data strongly suggest that the disposition to focus on positive or negative aspects of risks affects actual risk taking behavior. In our student sample and in a representative sample, we find that dispositional optimism, which predicts this disposition, is related to risk taking behavior. In the student sample it predicts lottery choices and in the representative sample investing in the stock market or being self-employed. These results are confirmed in our second experiment, where we have shown that optimists tend to take more risk precisely because they focus more on good outcomes. Our second experiment also shows that risk conception is related to how people treat and attend to outcomes rather than to their perception of probabilities.

Previous literature has shown that one of the reasons why the general risk question is a good predictor of risk taking behavior across contexts is the generality of its formulation (see Dohmen et al., 2011). Here, we offer an additional potential reason why the general risk question is a good predictor of risk taking behavior, the fact that it captures the disposition to focus on favorable or unfavorable outcomes of risky environments better than other measures of risk preferences that control more tightly risk conception, stakes and probabilities.

References

Beauchamp, Jonathan P, Cesarini, David, and Johannesson, Magnus (2017). "The psychometric and empirical properties of measures of risk preferences." *Journal of Risk and Uncertainty*, 54(3), 203–237.

Bock, Olaf, Baetge, Ingmar, and Nicklisch, Andreas (2014). "hroot: Hamburg registration and organization online tool." *European Economic Review*, 71, 117–120.

Bonin, Holger, Dohmen, Thomas, Falk, Armin, Huffman, David, and Sunde, Uwe (2007). "Cross-sectional earnings risk and occupational sorting: The role of risk attitudes." *Labour Economics*, 14(6), 926–937.

Bordalo, Pedro, Gennaioli, Nicola, and Shleifer, Andrei (2012). "Salience theory of choice under risk." *The Quarterly Journal of Economics*, 127(3), 1243–1285.

Brandts, Jordi and Cooper, David J (2007). "It's what you say, not what you pay: an experimental study of manager-employee relationships in overcoming coordination failure." *Journal of the European Economic Association*, 5(6), 1223–1268.

Bruhin, Adrian, Fehr-Duda, Helga, and Epper, Thomas (2010). "Risk and rationality: Uncovering heterogeneity in probability distortion." *Econometrica*, 78(4), 1375–1412.

Buser, Thomas, Niederle, Muriel, and Oosterbeek, Hessel (2014). "Gender, competitiveness, and career choices." *The Quarterly Journal of Economics*, 129(3), 1409–1447.

Caliendo, Marco, Fossen, Frank M, and Kritikos, Alexander S (2009). "Risk attitudes of nascent entrepreneurs–new evidence from an experimentally validated survey." *Small Business Economics*, 32(2), 153–167.

Carver, Charles S. and Scheier, Michael F (2014). "Dispositional optimism." *Trends in cognitive sciences*, 18(6), 293–299.

Carver, Charles S., Scheier, Michael F., and Segerstrom, Suzanne C. (2010). "Optimism." *Clinical Psychology Review*, 30(7), 879–889.

Charness, Gary and Gneezy, Uri (2012). "Strong Evidence for Gender Differences in Risk Taking." *Journal of Economic Behavior & Organization*, 83(1), 50–58.

Charness, Gary, Gneezy, Uri, and Imas, Alex (2013). "Experimental methods: Eliciting risk preferences." *Journal of Economic Behavior & Organization*, 87, 43–51.

Cohn, Alain, Engelmann, Jan, Fehr, Ernst, and Maréchal, Michel André (2015). "Evidence for countercyclical risk aversion: An experiment with financial professionals." *American Economic Review*, 105(2), 860–85.

Cooper, Arnold, Woo, Carolyn, and Dunkelberg, William (1988). "Entrepreneurs' perceived chances for success." *Journal of Business Venturing*, 3(2), 97–108.

Croson, Rachel and Gneezy, Uri (2009). "Gender differences in preferences." *Journal of Economic Literature*, 47(2), 448–74.

Dohmen, Thomas, Falk, Armin, Huffman, David, Sunde, Uwe, Schupp, Jürgen, and Wagner, Gert G. (2011). "Individual Risk Attitudes: Measurement, Determinants, and Behavioral Consequences." *Journal of the European Economic Association*, 9(3), 522–550.

Dohmen, Thomas, Quercia, Simone, and Willrodt, Jana (2018). "Knowing who you are: Salience of own preferences and the consensus effect." (mimeo).

Eckel, Catherine C and Grossman, Philip J (2008). "Men, women and risk aversion: Experimental evidence." *Handbook of Experimental Economics Results*, 1, 1061–1073.

Epper, Thomas, Fehr-Duda, Helga, and Bruhin, Adrian (2011). "Viewing the future through a warped lens: Why uncertainty generates hyperbolic discounting." *Journal of Risk and Uncertainty*, 43(3), 169–203.

Falk, Armin, Becker, Anke, Dohmen, Thomas, Enke, Benjamin, Huffman, David, and Sunde, Uwe (2018). "Global evidence on economic preferences." *The Quarterly Journal of Economics*, 133(4), 1645–1692.

Fehr-Duda, Helga, De Gennaro, Manuele, and Schubert, Renate (2006). "Gender, financial risk, and probability weights." *Theory and decision*, 60(2-3), 283–313.

Felton, James, Gibson, Bryan, and Sanbonmatsu, David M (2003). "Preference for risk in investing as a function of trait optimism and gender." *The Journal of Behavioral Finance*, 4(1), 33–40.

Fischbacher, Urs (Feb. 2007). "z-Tree: Zurich toolbox for ready-made economic experiments." *Experimental Economics*, 10(2), 171–178.

Gibson, Bryan and Sanbonmatsu, David M (2004). "Optimism, pessimism, and gambling: The downside of optimism." *Personality and Social Psychology Bulletin*, 30(2), 149–160.

Goebel, Jan, Grabka, Markus M, Liebig, Stefan, Kroh, Martin, Richter, David, Schröder, Carsten, and Schupp, Jürgen (2018). "The German Socio-Economic Panel (SOEP)." *Jahrbücher für Nationalökonomie und Statistik(/Journal of Economics and Statistics*, (online first).

Goldstein, William M and Einhorn, Hillel J (1987). "Expression theory and the preference reversal phenomena." *Psychological review*, 94(2), 236.

Grund, Christian and Sliwka, Dirk (2010). "Evidence on performance pay and risk aversion." *Economics Letters*, 106(1), 8–11.

Herzberg, Philipp Yorck, Glaesmer, Heide, and Hoyer, Jürgen (2006). "Separating optimism and pessimism: a robust psychometric analysis of the revised Life Orientation Test (LOT-R)." *Psychological Assessment*, 18(4), 433.

Jaeger, David A, Dohmen, Thomas, Falk, Armin, Huffman, David, Sunde, Uwe, and Bonin, Holger (2010). "Direct evidence on risk attitudes and migration." *The Review of Economics and Statistics*, 92(3), 684–689.

Kahneman, Daniel and Tversky, Amos (1979). "Prospect theory: An analysis of decision under risk." *Econometrica*, 47(2), 263–291.

Kemper, Christoph J, Wassermann, Maria, Hoppe, Annekatrin, Beierlein, Constanze, and Rammstedt, Beatrice (2015). "Measuring Dispositional Optimism in Large-Scale Studies." *European Journal of Psychological Assessment*, 33, 403–408.

Lattimore, Pamela K, Baker, Joanna R, and Witte, Ann D (1992). "The influence of probability on risky choice: A parametric examination." *Journal of Economic Behavior & Organization*, 17(3), 377–400.

Lönnqvist, Jan-Erik, Verkasalo, Markku, Walkowitz, Gari, and Wichardt, Philipp C. (2015). "Measuring individual risk attitudes in the lab: Task or ask? An empirical comparison." *Journal of Economic Behavior & Organization*, 119, 254–266.

Murad, Zahra, Sefton, Martin, and Starmer, Chris (2016). "How do risk attitudes affect measured confidence?" *Journal of Risk and Uncertainty*, 52(1), 21–46.

Prelec, Drazen (1998). "The probability weighting function." *Econometrica*, 497–527.

Puri, Manju and Robinson, David T (2007). "Optimism and economic choice." *Journal of Financial Economics*, 86(1), 71–99.

Quiggin, John (1982). "A theory of anticipated utility." *Journal of Economic Behavior & Organization*, 3(4), 323–343.

Scheier, Michael F, Carver, Charles S, and Bridges, Michael W (1994). "Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): a reevaluation of the Life Orientation Test." *Journal of Personality and Social Psychology*, 67(6), 1063.

Schupp, Jürgen and Gerlitz, Jean-Yves (2008). "BFI-S: Big Five Inventory-SOEP." In *Zusammenstellung sozialwissenschaftlicher Items und Skalen. ZIS Version*. Vol. 12.

Starmer, Chris (2000). “Developments in non-expected utility theory: The hunt for a descriptive theory of choice under risk.” *Journal of Economic Literature*, 38(2), 332–382.

Taylor, Shelley and Thompson, Suzanne (1982). “Stalking the elusive vividness efb00ect.” *Psychological Review*, 89(2), 155–181.

Tennen, Howard and Affleck, Glenn (1987). “The costs and benefits of optimistic explanations and dispositional optimism.” *Journal of Personality*, 55(2), 377–392.

Vieider, Ferdinand M, Lefebvre, Mathieu, Bouchouicha, Ranoua, Chmura, Thorsten, Hakimov, Rustamdjan, Krawczyk, Michal, and Martinsson, Peter (2015). “Common components of risk and uncertainty attitudes across contexts and domains: Evidence from 30 countries.” *Journal of the European Economic Association*, 13(3), 421–452.

Wakker, Peter P (2010). *Prospect theory: For risk and ambiguity*. Cambridge University Press.

Weinstein, Neil D (1982). “Unrealistic optimism about susceptibility to health problems.” *Journal of Behavioral Medicine*, 5(4), 441–460.

A Supplementary material (for online publication)

A.1 Full study

Week 1	**Week 2**	**Week 3**
Mood Question	Mood Question	Mood Question
General Risk Question	**General Risk Question**	**General Risk Question**
		Risk Conception Questions - Free form
		Risk Conception Questions - Likert Scale
Big Five	**Big Five**	**Big Five**
	Trust Question	Locus of Control
Binary Trust Game: Treatments		Binary Trust Game: Treatments
Risk Premia (Choice Lists)		**Risk Premia (Choice Lists)**
Probabilities of Real-life Events	"Will you win?" task	Common Ratio Effect
	Visual Perception Task	BRET
	Ambiguity Preferences	
	Optimism: LOT and SOP	**Optimism: LOT and SOP**
Sociodemographics		**Cognitive Ability: Raven Matrices**
Mood Question	Mood Question	Mood Question

Notes. The variables relevant to the research question of this paper are printed in bold font. For variables that were measured repeatedly, we used the measure from week 3 unless stated otherwise. For detailed information on the different treatments for the binary trust game refer to paper Dohmen et al. (2018). The "Will you win?" task was included in the first experiment as a first attempt to measure focus. It consists of subjects stating whether they think they will win or lose a lottery with $p = 50\%$. We find a Spearman rank correlation of $\rho = 0.373$ ($p < .001$) between "Will you win?" and SOP. This result is generally consistent with our view of risk conception as focus on positive or negative outcomes. However, since (i) it is not immediately straightforward that this measure can be unequivocally related to focus but may be a different operationalization of dispositional optimism and (ii) we view our new measures from the second experiment more related to attentional processes, we do not report this result in the main text.

Table A.1. Chronological overview of all tasks participants completed.

A.2 Correlations between responses to risk conception questions

	Risk - neg/pos	Risk - stake size	Risk - stake size (gains)
Risk - stake size	-0.071		
	(0.185)		
Risk - stake size (gains)	0.278	0.205	
	(<0.001)	(<0.001)	
Risk - stake size (losses)	-0.288	0.449	0.133
	(<0.001)	(<0.001)	(0.013)

Notes. N= 348. p-values in parentheses

Table A.2. Spearman rank correlations between responses to risk conception questions

A.3 Free-form responses

Before answering the four risk conception questions described in the main text, subjects were asked to report in free-form text what they thought about when answering the general risk question. Answers varied substantially, with some subjects stating financial risk, others considering the risk of being the victims of crime, or risk taking in sports. We coded the answers employing the following procedure: Two research assistants unfamiliar with the research question and the rest of the dataset coded the answers independently such that coding errors would be uncorrelated. They created four categorical variables for each answer, one referring to the positive/negative valence and three referring to the stake size in general, stake size in the gains dimension, and stake size in the loss dimension respectively . "Free form - neg/pos" could be either positive (1) or negative (−1), while "Free form - stake size", "Free form - stake size (gains)" and "Free form - stake size (losses)" could be large (1) or small (−1). Furthermore, each variable took the value 0, if answers were mixed or not classifiable[22]. We found significant cross-coder Spearman rank correlations of $\rho = .49$, $\rho = .71$, $\rho = .61$, and $\rho = .38$ ($p < .001$ for all four) for valence ("Free form - neg/pos"), stake size, stake size (gains), and stake size (losses), respectively. For the analysis reported in the paper, we average the values across coders. Average responses to the risk conception questions split by coded free-form question response are reported in Table A.3 below.

	Free form - neg/pos			Free form - stake size		
Value	Frequency	Mean	SD	Frequency	Mean	SD
-1	44	2.682	1.137	74	3	1.365
-0.5	43	2.767	1.231	42	3.571	1.548
0	146	3.479	1.266	175	4.325	1.391
0.5	93	4.097	1.533	36	5.028	1.464
1	22	4.545	1.405	21	4.905	1.411
	Free form - stake s. (gains)			Free form - stake s. (losses)		
Value	Frequency	Mean	SD	Frequency	Mean	SD
-1	40	3.675	1.269	30	3.333	1.583
-0.5	42	4.095	1.559	54	4.5	1.587
0	194	4.175	1.472	217	4.631	1.498
0.5	48	4.708	1.557	44	4.545	1.745
1	24	4.125	1.801	3	4.333	1.154

Table A.3. Responses to selected risk conception questions (by coded answer to free form question)

[22] Mixed answers can occur in situations where subjects state more than one risky situation.

	General risk question					
	(1)	(2)	(3)	(4)	(5)	(6)
Free form - neg/pos	0.327***	0.265***				
	(0.058)	(0.051)				
Free form - stake size	-0.006		-0.019			
	(0.069)		(0.053)			
Free form - stake size (gains)	0.210***			0.086		
	(0.073)			(0.053)		
Free form - stake size (losses)	-0.040				0.084	
	(0.064)				(0.053)	
Female	-0.272***	-0.284***	-0.282**	-0.278**	-0.281**	-0.283**
	(0.105)	(0.106)	(0.110)	(0.110)	(0.110)	(0.110)
Cognitive Ability (Raven)	-0.120**	-0.116**	-0.116**	-0.117**	-0.109**	-0.117**
	(0.051)	(0.052)	(0.054)	(0.053)	(0.054)	(0.053)
Constant	0.168**	0.175**	0.173**	0.171**	0.173**	0.174**
	(0.082)	(0.083)	(0.086)	(0.086)	(0.086)	(0.086)
R^2	0.13	0.10	0.03	0.04	0.04	0.03
N	348	348	348	348	348	348

Notes. OLS regressions. Standard errors in parentheses * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized. The dependent variable is the general risk question elicited on an 11-point scale. The independent variables are generated by coding the answer to the free form question "What kind of risk did you think of while answering the general risk question?"

Table A.4. Robustness check to Table 1: Free-form variables

A.4 Robustness checks to Table 1: Relationship between the general risk question elicited in other weeks and risk conception

	General risk question (week 1)					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk - neg/pos	0.464***	0.525***				
	(0.050)	(0.045)				
Risk - stake size	0.032		-0.016			
	(0.051)		(0.053)			
Risk - stake size (gains)	0.116**			0.249***		
	(0.049)			(0.051)		
Risk - stake size (losses)	-0.097*				-0.208***	
	(0.053)				(0.052)	
Female	-0.166*	-0.177*	-0.297***	-0.246**	-0.296***	-0.297***
	(0.093)	(0.093)	(0.109)	(0.106)	(0.107)	(0.109)
Cognitive Ability (Raven)	-0.113**	-0.101**	-0.103*	-0.107**	-0.126**	-0.103*
	(0.045)	(0.045)	(0.053)	(0.052)	(0.052)	(0.053)
Constant	0.091	0.098	0.172**	0.140*	0.171**	0.172**
	(0.072)	(0.073)	(0.086)	(0.083)	(0.084)	(0.085)
R^2	0.32	0.30	0.03	0.09	0.07	0.03
N	348	348	348	348	348	348

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized. The independent variables "Risk - neg/pos" to "Risk - stake size (losses)" consist of the answers to questions eliciting what subjects thought of while answering the general risk question along the dimensions of valence and stake size.

Table A.5. Robustness check to Table 1: Relationship between the general risk question (elicited in week 1) and risk conception.

	General risk question (week 2)					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk - neg/pos	0.451***	0.508***				
	(0.051)	(0.046)				
Risk - stake size	0.037		-0.016			
	(0.052)		(0.054)			
Risk - stake size (gains)	0.099*			0.232***		
	(0.050)			(0.053)		
Risk - stake size (losses)	-0.102*				-0.205***	
	(0.054)				(0.053)	
Female	-0.203**	-0.216**	-0.342***	-0.293***	-0.330***	-0.341***
	(0.095)	(0.096)	(0.111)	(0.109)	(0.109)	(0.111)
Cognitive Ability (Raven)	-0.087*	-0.077*	-0.076	-0.077	-0.097*	-0.076
	(0.046)	(0.046)	(0.054)	(0.052)	(0.053)	(0.054)
Constant	0.109	0.116	0.186**	0.160*	0.179**	0.186**
	(0.074)	(0.075)	(0.087)	(0.085)	(0.085)	(0.087)
R^2	0.304	0.290	0.031	0.085	0.073	0.031
N	335	335	335	335	335	335

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized. The independent variables "Risk - neg/pos" to "Risk - stake size (losses)" consist of the answers to questions eliciting what subjects thought of while answering the general risk question along the dimensions of valence and stake size.

Table A.6. Robustness check to Table 1: Relationship between the general risk question (elicited in week 2) and risk conception.

A.5 LOT-R questionnaire

For the validation of the German version we used refer to Herzberg et al. (2006).

English version by Scheier et al. (1994): Please state to what extent your opinion agrees with the following statements (7 point Likert Scale from "does not apply to me at all" to "applies to me exactly").

1. In uncertain times, I usually expect the best.
2. It's easy for me to relax.
3. If something can go wrong for me, it will. (R)
4. I'm always optimistic about my future.
5. I enjoy my friends a lot.
6. It's important for me to keep busy.
7. I hardly ever expect things to go my way. (R)
8. I don't get upset too easily.
9. I rarely count on good things happening to me. (R)
10. Overall, I expect more good things to happen to me than bad.

Items marked with *(R)* are reverse-scaled, while items 2, 5, 6 and 8 are fillers.

A.6 Risk behavior measure - Lottery choice lists

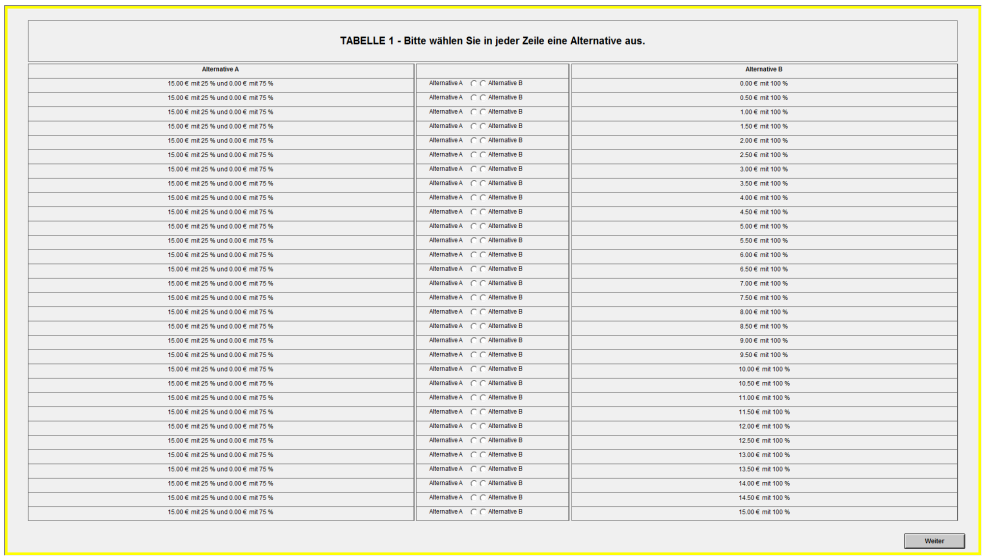

TABELLE 1 - Bitte wählen Sie in jeder Zeile eine Alternative aus.

Alternative A		Alternative B
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	0.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	0.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	1.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	1.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	2.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	2.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	3.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	3.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	4.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	4.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	5.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	5.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	6.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	6.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	7.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	7.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	8.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	8.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	9.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	9.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	10.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	10.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	11.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	11.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	12.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	12.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	13.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	13.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	14.00 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	14.50 € mit 100 %
15.00 € mit 25 % und 0.00 € mit 75 %	Alternative A ◯ ◯ Alternative B	15.00 € mit 100 %

Weiter

Figure A.1. Exemplary Choice list: Certainty equivalent of lottery “15 €with 25% and 0 €with 75%” Translation from German: "TABLE 1 - Please choose an alternative in each row."

A.7 Measurement of cognitive ability

The appropriateness of the level of difficulty for a student population is confirmed by the roughly normal distribution of the number of correctly solved matrices displayed in Figure A.2.

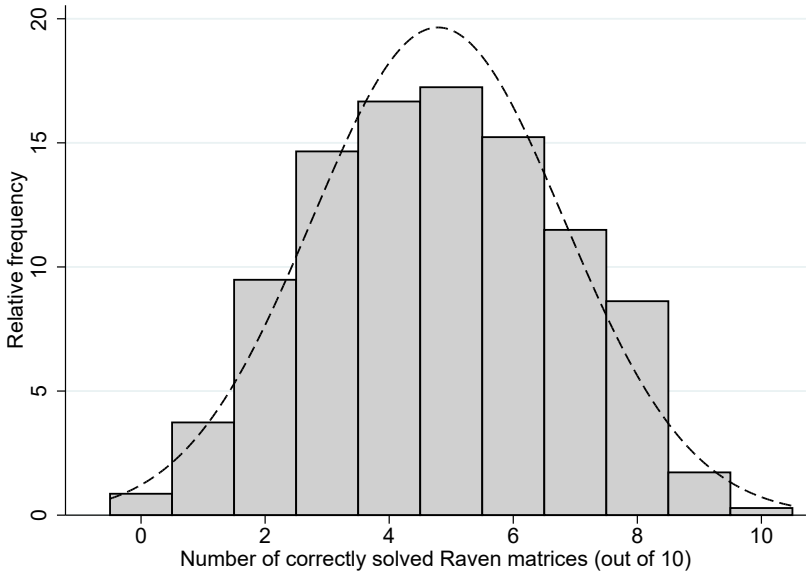

Figure A.2. Distribution of proxy for cognitive ability.

A.8 Gender differences in risk conception

	Risk - neg/pos	Risk - stake size	Risk - stake size (gains)	Risk - stake size (losses)
	(1)	(2)	(3)	(4)
Female	-0.228**	-0.048	-0.205*	0.002
	(0.111)	(0.111)	(0.111)	(0.111)
Cognitive Ability (Raven)	-0.003	-0.035	0.019	-0.112**
	(0.054)	(0.054)	(0.054)	(0.054)
Constant	0.140	0.029	0.126	-0.001
	(0.087)	(0.087)	(0.087)	(0.087)
R^2	0.012	0.002	0.011	0.013
N	348	348	348	348

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. The dependent variables consist of the answers to questions eliciting what subjects thought of while answering the general risk question along the dimensions of valence and stake size. All variables except "Female" are standardized.

Table A.7. Relationship between gender and risk conception

A.9 Ordered probit regressions for main results

	General risk question					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk - pos/neg	0.731***	0.816***				
	(0.068)	(0.064)				
Risk - stake size	0.120*		-0.005			
	(0.063)		(0.054)			
Risk - stake size (gains)	0.132**			0.268***		
	(0.061)			(0.056)		
Risk - stake size (losses)	-0.251***				-0.320***	
	(0.067)				(0.056)	
Female	-0.200*	-0.203*	-0.306***	-0.262**	-0.320***	-0.306***
	(0.115)	(0.114)	(0.113)	(0.114)	(0.113)	(0.113)
Cognitive Ability (Raven)	-0.187***	-0.155***	-0.121**	-0.130**	-0.164***	-0.121**
	(0.056)	(0.056)	(0.055)	(0.055)	(0.056)	(0.055)
Constant cut1	-2.402***	-2.354***	-1.928***	-1.948***	-2.018***	-1.928***
	(0.165)	(0.163)	(0.143)	(0.143)	(0.146)	(0.143)
Constant cut2	-1.591***	-1.549***	-1.281***	-1.294***	-1.349***	-1.281***
	(0.124)	(0.123)	(0.112)	(0.113)	(0.114)	(0.112)
Constant cut3	-0.976***	-0.949***	-0.811***	-0.812***	-0.856***	-0.811***
	(0.110)	(0.109)	(0.102)	(0.102)	(0.103)	(0.102)
Constant cut4	-0.636***	-0.617***	-0.564***	-0.558***	-0.596***	-0.564***
	(0.106)	(0.105)	(0.099)	(0.100)	(0.100)	(0.099)
Constant cut5	0.008	0.007	-0.096	-0.071	-0.098	-0.096
	(0.103)	(0.102)	(0.097)	(0.098)	(0.098)	(0.097)
Constant cut6	0.532***	0.513***	0.295***	0.340***	0.315***	0.295***
	(0.106)	(0.105)	(0.098)	(0.099)	(0.099)	(0.098)
Constant cut7	1.174***	1.131***	0.783***	0.850***	0.829***	0.783***
	(0.117)	(0.115)	(0.104)	(0.106)	(0.106)	(0.104)
Constant cut8	2.129***	2.064***	1.500***	1.594***	1.573***	1.500***
	(0.159)	(0.156)	(0.132)	(0.135)	(0.134)	(0.132)
Constant cut9	2.777***	2.701***	2.042***	2.149***	2.120***	2.042***
	(0.218)	(0.214)	(0.187)	(0.191)	(0.189)	(0.187)
N	348	348	348	348	348	348

Notes. Ordered probit regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized.

Table A.8. Robustness Check to Table 1. Relationship between the general risk question and risk conception.

	Risk - neg/pos	Risk - stake size	Risk - stake size (gains)	Risk - stake size (losses)
	(1)	(2)	(3)	(4)
Optimism (SOP)	0.238***	-0.022	0.034	-0.143**
	(0.056)	(0.055)	(0.055)	(0.056)
Female	-0.251**	-0.050	-0.194*	0.034
	(0.115)	(0.114)	(0.114)	(0.114)
Cognitive Ability (Raven)	-0.013	-0.036	0.017	-0.119**
	(0.056)	(0.055)	(0.056)	(0.056)
Constant cut1	-1.609***	-1.690***	-1.815***	-1.667***
	(0.126)	(0.136)	(0.139)	(0.136)
Constant cut2	-0.874***	-0.931***	-1.178***	-1.156***
	(0.104)	(0.105)	(0.111)	(0.113)
Constant cut3	-0.159*	-0.382***	-0.609***	-0.599***
	(0.097)	(0.097)	(0.100)	(0.101)
Constant cut4	0.656***	0.225**	0.107	-0.074
	(0.101)	(0.097)	(0.097)	(0.097)
Constant cut5	1.207***	0.777***	0.645***	0.490***
	(0.116)	(0.103)	(0.101)	(0.098)
Constant cut6	1.757***	1.656***	1.545***	1.531***
	(0.150)	(0.137)	(0.132)	(0.127)
N	348	348	348	348

Notes. Ordered probit regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized.

Table A.9. Robustness check to Table 2: Relationship between risk conception and dispositional optimism.

	General risk question					
	(1)	(2)	(3)	(4)	(5)	(6)
Optimism (SOP)	0.233***	0.106*	0.115**	0.233***	0.233***	0.202***
	(0.055)	(0.057)	(0.057)	(0.055)	(0.055)	(0.056)
Risk - neg/pos		0.712***	0.795***			
		(0.069)	(0.065)			
Risk - stake size		0.116*		-0.003		
		(0.063)		(0.054)		
Risk - stake size (gains)		0.136**			0.269***	
		(0.061)			(0.056)	
Risk - stake size (losses)		-0.243***				-0.298***
		(0.067)				(0.057)
Female	-0.307***	-0.203*	-0.207*	-0.307***	-0.263**	-0.320***
	(0.113)	(0.115)	(0.114)	(0.113)	(0.114)	(0.113)
Cognitive Ability (Raven)	-0.131**	-0.191***	-0.159***	-0.132**	-0.141**	-0.170***
	(0.055)	(0.056)	(0.056)	(0.055)	(0.055)	(0.056)
Constant cut1	-1.978***	-2.418***	-2.373***	-1.978***	-2.000***	-2.057***
	(0.145)	(0.165)	(0.164)	(0.145)	(0.145)	(0.147)
Constant cut2	-1.315***	-1.603***	-1.563***	-1.315***	-1.330***	-1.376***
	(0.113)	(0.125)	(0.124)	(0.113)	(0.114)	(0.115)
Constant cut3	-0.828***	-0.982***	-0.956***	-0.828***	-0.831***	-0.869***
	(0.102)	(0.110)	(0.109)	(0.102)	(0.103)	(0.104)
Constant cut4	-0.574***	-0.639***	-0.621***	-0.574***	-0.568***	-0.602***
	(0.100)	(0.106)	(0.105)	(0.100)	(0.100)	(0.101)
Constant cut5	-0.094	0.006	0.005	-0.094	-0.069	-0.096
	(0.097)	(0.103)	(0.103)	(0.097)	(0.098)	(0.098)
Constant cut6	0.310***	0.535***	0.516***	0.310***	0.355***	0.327***
	(0.099)	(0.106)	(0.105)	(0.099)	(0.100)	(0.100)
Constant cut7	0.813***	1.183***	1.140***	0.813***	0.882***	0.854***
	(0.105)	(0.117)	(0.115)	(0.105)	(0.107)	(0.107)
Constant cut8	1.545***	2.139***	2.075***	1.545***	1.641***	1.609***
	(0.133)	(0.159)	(0.157)	(0.133)	(0.137)	(0.135)
Constant cut9	2.083***	2.779***	2.706***	2.082***	2.191***	2.149***
	(0.186)	(0.217)	(0.213)	(0.186)	(0.191)	(0.188)
N	348	348	348	348	348	348

Notes. Ordered probit regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized.

Table A.10. Robustness check to Table 3: Relationship between the general risk question and dispositional optimism controlling for risk conception.

	Risk taking: Stocks			Risk taking: Self-employed		
	(1)	(2)	(3)	(4)	(5)	(6)
Std. Optimism	0.053***		0.043***	0.076***		0.044**
	(0.016)		(0.016)	(0.021)		(0.022)
Std. General risk question		0.067***	0.060***		0.192***	0.186***
		(0.016)	(0.016)		(0.023)	(0.024)
Female	0.033	0.049	0.045	-0.125**	-0.074	-0.075
	(0.043)	(0.043)	(0.043)	(0.054)	(0.055)	(0.055)
Age	0.002**	0.002**	0.003**	0.023***	0.024***	0.024***
	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)
Height	0.006**	0.005**	0.005**	0.005*	0.005	0.004
	(0.002)	(0.002)	(0.002)	(0.003)	(0.003)	(0.003)
Abitur mother	-0.095	-0.090	-0.099	0.297***	0.277***	0.285***
	(0.061)	(0.061)	(0.061)	(0.065)	(0.066)	(0.066)
Abitur father	0.229***	0.229***	0.234***	0.207***	0.228***	0.220***
	(0.046)	(0.046)	(0.046)	(0.054)	(0.055)	(0.055)
Log househ. wealth	0.041***	0.042***	0.041***	0.015***	0.018***	0.018***
	(0.003)	(0.003)	(0.003)	(0.005)	(0.005)	(0.005)
Log househ. debt	-0.028***	-0.028***	-0.028***	0.004	0.004	0.005
	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)	(0.008)
Log net househ. income	0.747***	0.742***	0.737***	0.000	0.006	0.001
	(0.034)	(0.034)	(0.034)	(0.044)	(0.044)	(0.044)
Number of adults in hh	-0.161***	-0.157***	-0.154***			
	(0.025)	(0.025)	(0.025)			
Constant	7.731***	7.714***	7.632***	3.262***	3.418***	3.352***
	(0.513)	(0.514)	(0.515)	(0.659)	(0.660)	(0.664)
N	9,324	9,325	9,267	8,593	8,573	8,537

Notes. Probit regressions. Standard errors in parentheses. $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. The samples in columns 1 to 3 include only household heads. The dependent variable takes a value of 1 if the household holds stocks and 0 otherwise. The dependent variable in columns 4 to 6 takes a value of 1 if respondent is self-employed and 0 otherwise. Here, we limit the sample to individuals under 66 years who are part of the labor force.

Table A.11. Robustness check to Table 5: Relationship between risk taking behavior and dispositional optimism.

	General risk question				
	(1)	(2)	(3)	(4)	(5)
Risk - neg/pos	0.607***		0.585***		
	(0.084)		(0.085)		
Optimism (SOP)		0.214***	0.117		0.196**
		(0.078)	(0.080)		(0.079)
δ				0.124	0.093
				(0.078)	(0.079)
Female	0.019	-0.102	0.043	-0.079	-0.046
	(0.158)	(0.156)	(0.158)	(0.160)	(0.161)
Cognitive Ability (Raven)	-0.131*	-0.118	-0.121	-0.132*	-0.115
	(0.077)	(0.077)	(0.077)	(0.077)	(0.077)
Constant cut1	-2.101***	-1.964***	-2.109***	-1.917***	-1.940***
	(0.215)	(0.208)	(0.217)	(0.206)	(0.209)
Constant cut2	-1.079***	-1.002***	-1.072***	-0.969***	-0.968***
	(0.150)	(0.145)	(0.150)	(0.146)	(0.147)
Constant cut3	-0.667***	-0.630***	-0.655***	-0.603***	-0.593***
	(0.142)	(0.138)	(0.142)	(0.139)	(0.140)
Constant cut4	-0.295**	-0.306**	-0.279**	-0.285**	-0.266*
	(0.139)	(0.135)	(0.139)	(0.136)	(0.137)
Constant cut5	0.045	-0.016	0.064	-0.000	0.026
	(0.137)	(0.133)	(0.138)	(0.135)	(0.136)
Constant cut6	0.481***	0.355***	0.504***	0.367***	0.400***
	(0.139)	(0.134)	(0.140)	(0.136)	(0.137)
Constant cut7	1.105***	0.882***	1.125***	0.902***	0.936***
	(0.151)	(0.142)	(0.152)	(0.145)	(0.145)
Constant cut8	2.039***	1.695***	2.056***	1.684***	1.724***
	(0.209)	(0.188)	(0.209)	(0.189)	(0.190)
N	182	182	182	181	181

Notes. Ordered probit regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized. δ is the standardized elevation parameter of the estimated weighting function.

Table A.12. Robustness check to Table 6: Relationship between the general risk question, risk conception, optimism, and probability weighting.

	Selective information: Reveal higher outcome (1)	Attention: Longer time on higher outcome (2)	Memory: Remember good outcome (3)
Optimism (SOP)	0.037	0.148*	0.168*
	(0.097)	(0.079)	(0.097)
Female	-0.250	-0.144	0.067
	(0.197)	(0.160)	(0.195)
Cognitive Ability (Raven)	-0.309***	-0.071	0.096
	(0.099)	(0.079)	(0.096)
Constant cut2		-1.534***	
		(0.171)	
Constant cut3		-0.391***	
		(0.134)	
Constant cut4		0.611***	
		(0.137)	
Constant cut5		1.369***	
		(0.168)	
Constant cut6		1.878***	
		(0.219)	
Constant cut7		2.268***	
		(0.292)	
Constant cut8		2.527***	
		(0.371)	
Constant cut1	-0.280*	-2.618***	0.031
	(0.151)	(0.358)	(0.149)
N	182	182	175

Notes. Ordered probit regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All independent variables except "Female" are standardized.

Table A.13. Robustness check to Table 7: Relationship between the different focusing tasks, dispositional optimism and probability weighting.

A.10 Robustness of results to use of different specifications

Specification 1	Risk - neg/pos	Risk - stake size	Risk - stake size (gains)	Risk - stake size (losses)
	(1)	(2)	(3)	(4)
Optimism (LOT) - week 3	0.204***	-0.002	0.055	-0.157***
	(0.053)	(0.056)	(0.056)	(0.055)
Female	-0.227**	-0.034	-0.238**	0.037
	(0.110)	(0.116)	(0.114)	(0.113)
Cognitive Ability (Raven)	-0.011	-0.029	-0.014	-0.105*
	(0.054)	(0.057)	(0.056)	(0.055)
Constant	0.102	0.021	0.140	-0.011
	(0.085)	(0.090)	(0.088)	(0.087)
R^2	0.06	0.00	0.02	0.04
N	326	326	326	326
Specification 2	**Risk - neg/pos**	**Risk - stake size**	**Risk - stake size (gains)**	**Risk - stake size (losses)**
	(1)	(2)	(3)	(4)
Optimism (SOP) - week 2	0.260***	0.003	0.021	-0.214***
	(0.053)	(0.055)	(0.055)	(0.054)
Female	-0.236**	-0.014	-0.209*	0.049
	(0.109)	(0.114)	(0.113)	(0.111)
Cognitive Ability (Raven)	-0.004	-0.029	0.005	-0.097*
	(0.053)	(0.055)	(0.055)	(0.054)
Constant	0.130	0.016	0.111	-0.028
	(0.086)	(0.089)	(0.088)	(0.087)
R^2	0.08	0.00	0.01	0.06
N	335	335	335	335
Specification 3	**Risk - neg/pos**	**Risk - stake size**	**Risk - stake size (gains)**	**Risk - stake size (losses)**
	(1)	(2)	(3)	(4)
Optimism (LOT) - week 2	0.239***	0.018	0.023	-0.162***
	(0.053)	(0.055)	(0.055)	(0.054)
Female	-0.238**	-0.014	-0.209*	0.052
	(0.110)	(0.114)	(0.113)	(0.112)
Cognitive Ability (Raven)	-0.023	-0.031	0.003	-0.085
	(0.054)	(0.056)	(0.055)	(0.055)
Constant	0.134	0.016	0.112	-0.032
	(0.086)	(0.089)	(0.088)	(0.087)
R^2	0.07	0.00	0.01	0.04
N	335	335	335	335

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$.The dependent variables consist of the answers to questions eliciting what subjects thought of while answering the general risk question along the dimensions of valence and stake size. The optimism measure varies by specification. LOT-R is the Life Orientation Test. SOP is a two-item measure assessing subjects self-stated optimism and pessimism. Both were elicited in weeks 2 and 3. All variables except "Female" are standardized.

Table A.14. Robustness check to Table 2.

	Risk - neg/pos						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS	OLS	2SLS	OLS	OLS	2SLS
Optimism (SOP - week 3)	0.223***			0.313***			0.197**
	(0.052)			(0.065)			(0.081)
Optimism (SOP - week 2)		0.260***					
		(0.053)					
Optimism (SOP - agg)			0.253***		0.253***	0.139**	
			(0.053)		(0.055)	(0.062)	
Female	-0.220**	-0.236**	-0.236**	-0.234**	-0.236**	-0.078	-0.094
	(0.108)	(0.109)	(0.110)	(0.111)	(0.110)	(0.117)	(0.120)
Cognitive Ability (Raven)	-0.009	-0.004	-0.006	-0.009	-0.006	0.034	0.026
	(0.053)	(0.053)	(0.053)	(0.054)	(0.053)	(0.053)	(0.053)
Mood (week 3)					0.001		
					(0.056)		
Conscientiousness (agg)						-0.118**	
						(0.054)	
Extraversion (agg)						0.203***	
						(0.061)	
Openness(agg)						0.013	
						(0.053)	
Agreeableness (agg)						-0.109**	
						(0.053)	
Neuroticism (agg)						-0.172***	
						(0.060)	
Conscientiousness (week 3)							-0.073
							(0.061)
Extraversion (week 3)							0.181**
							(0.071)
Openness (week 3)							0.035
							(0.059)
Agreeableness (week 3)							-0.130**
							(0.065)
Neuroticism (week 3)							-0.150**
							(0.071)
Constant	0.135	0.130	0.130	0.131	0.130	0.033	0.048
	(0.084)	(0.086)	(0.086)	(0.087)	(0.086)	(0.088)	(0.090)
R^2	0.06	0.08	0.08	0.06	0.08	0.16	0.15
N	348	335	335	335	335	335	335

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. While "Risk - neg/pos" was elicited in week 3, models 1 and 2 use the SOP measures from weeks 3 and 2, respectively. Models 3,5 and 6 use the SOP measure aggregated over these two weeks, with model 5 including mood (beginning of session in week 3) and model 6 including the Big Five (aggregated across weeks 2 and 3) as controls. Models 4 and 7 are two-stage least squares estimations using the variables for SOP and the Big Five from week 2 as instruments for those from week 3. All variables except "Female" are standardized.

Table A.15. Robustness check: Relationship between optimism and risk conception questions

	Risk - stake size						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS	OLS	2SLS	OLS	OLS	2SLS
Optimism (SOP - week 3)	-0.015			0.004			-0.043
	(0.054)			(0.067)			(0.087)
Optimism (SOP - week 2)		0.003					
		(0.055)					
Optimism (SOP - agg)			-0.004		-0.001	-0.040	
			(0.055)		(0.058)	(0.066)	
Female	-0.048	-0.014	-0.014	-0.014	-0.014	0.004	0.023
	(0.111)	(0.114)	(0.114)	(0.114)	(0.114)	(0.127)	(0.129)
Cognitive Ability (Raven)	-0.035	-0.029	-0.029	-0.029	-0.029	-0.038	-0.040
	(0.054)	(0.055)	(0.055)	(0.055)	(0.056)	(0.057)	(0.057)
Mood (week 3)					-0.010		
					(0.058)		
Conscientiousness (agg)						0.047	
						(0.058)	
Extraversion (agg)						-0.051	
						(0.066)	
Openness (agg)						0.116**	
						(0.058)	
Agreeableness (agg)						0.031	
						(0.057)	
Neuroticism (agg)						-0.066	
						(0.065)	
Conscientiousness (week 3)							0.040
							(0.066)
Extraversion (week 3)							-0.053
							(0.077)
Openness (week 3)							0.105*
							(0.063)
Agreeableness (week 3)							0.027
							(0.070)
Neuroticism (week 3)							-0.085
							(0.076)
Constant	0.030	0.016	0.016	0.016	0.016	0.005	-0.006
	(0.087)	(0.089)	(0.089)	(0.089)	(0.089)	(0.095)	(0.096)
R^2	0.002	0.001	0.001	0.001	0.012	0.019	0.021
N	348	335	335	335	335	335	335

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. While "Risk - stake size" was elicited in week 3, models 1 and 2 use the SOP measures from weeks 3 and 2, respectively. Models 3,5 and 6 use the SOP measure aggregated over these two weeks, with model 5 including mood (beginning of session in week 3) and model 6 including the Big Five (aggregated across weeks 2 and 3) as controls. Models 4 and 7 are two-stage least squares estimations using the variables for SOP and the Big Five from week 2 as instruments for those from week 3. All variables except "Female" are standardized.

Table A.16. Robustness check: Relationship between optimism and risk conception questions

	Risk - stake size (gains)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS	OLS	2SLS	OLS	OLS	2SLS
Optimism (SOP - week 3)	0.036			0.031		-0.060	
	(0.066)			(0.081)		(0.106)	
Optimism (SOP - week 2)		0.025					
		(0.065)					
Optimism (SOP - agg)			0.034		0.023	-0.033	
			(0.069)		(0.072)	(0.083)	
Female	-0.308*	-0.316*	-0.316*	-0.316*	-0.316*	-0.273	-0.257
	(0.168)	(0.171)	(0.171)	(0.171)	(0.171)	(0.189)	(0.193)
Cognitive Ability (Raven)	0.013	0.004	0.004	0.004	0.002	0.023	0.025
	(0.040)	(0.041)	(0.041)	(0.041)	(0.041)	(0.042)	(0.042)
Mood (week 3)					0.021		
					(0.040)		
Conscientiousness (agg)						-0.009	
						(0.086)	
Extraversion (agg)						0.147*	
						(0.076)	
Openness (agg)						0.015	
						(0.068)	
Agreeableness (agg)						-0.146	
						(0.095)	
Neuroticism (agg)						-0.047	
						(0.078)	
Conscientiousness (week 3)							-0.036
							(0.094)
Extraversion (week 3)							0.159*
							(0.085)
Openness (week 3)							0.018
							(0.073)
Agreeableness (week 3)							-0.113
							(0.107)
Neuroticism (week 3)							-0.048
							(0.087)
Constant	4.271***	4.305***	4.298***	4.301***	4.171***	4.479***	4.375***
	(0.250)	(0.255)	(0.255)	(0.258)	(0.348)	(0.841)	(0.904)
R^2	0.012	0.011	0.011	0.012	0.012	0.033	0.033
N	348	335	335	335	335	335	335

Notes. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. While "Risk - stake size (gains)" was elicited in week 3, models 1 and 2 use the SOP measures from weeks 3 and 2, respectively. Models 3,5 and 6 use the SOP measure aggregated over these two weeks, with model 5 including mood (beginning of session in week 3) and model 6 including the Big Five (aggregated across weeks 2 and 3) as controls. Models 4 and 7 are two-stage least squares estimations using the variables for SOP and the Big Five from week 2 as instruments for those from week 3. All variables except "Female" are standardized.

Table A.17. Robustness check: Relationship between optimism and risk conception questions

	Risk - stake size (losses)						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	OLS	OLS	OLS	2SLS	OLS	OLS	2SLS
Optimism (SOP - week 3)	-0.138***			-0.258***			-0.292***
	(0.053)			(0.066)			(0.088)
Optimism (SOP - week 2)		-0.214***					
		(0.054)					
Optimism (SOP - agg)			-0.187***		-0.164***	-0.200***	
			(0.054)		(0.056)	(0.065)	
Female	-0.003	0.049	0.050	0.047	0.050	0.014	0.032
	(0.110)	(0.111)	(0.111)	(0.113)	(0.111)	(0.125)	(0.129)
Cognitive Ability (Raven)	-0.108**	-0.097*	-0.096*	-0.093*	-0.092*	-0.093*	-0.086
	(0.054)	(0.054)	(0.054)	(0.055)	(0.054)	(0.056)	(0.057)
Mood (week 3)					-0.085		
					(0.057)		
Conscientiousness (agg)						0.019	
						(0.057)	
Extraversion (agg)						0.002	
						(0.065)	
Openness (agg)						0.048	
						(0.057)	
Agreeableness (agg)						0.034	
						(0.056)	
Neuroticism (agg)						0.024	
						(0.063)	
Conscientiousness (week 3)							-0.018
							(0.066)
Extraversion (week 3)							0.035
							(0.077)
Openness (week 3)							0.029
							(0.063)
Agreeableness (week 3)							0.048
							(0.070)
Neuroticism (week 3)							0.003
							(0.076)
Constant	0.002	-0.028	-0.029	-0.029	-0.029	-0.007	-0.020
	(0.086)	(0.087)	(0.087)	(0.088)	(0.087)	(0.094)	(0.096)
R^2	0.032	0.058	0.047	0.020	0.054	0.051	0.017
N	348	335	335	335	335	335	335

Notes. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. While "Risk - stake size (losses)" was elicited in week 3, models 1 and 2 use the SOP measures from weeks 3 and 2, respectively. Models 3,5 and 6 use the SOP measure aggregated over these two weeks, with model 5 including mood (beginning of session in week 3) and model 6 including the Big Five (aggregated across weeks 2 and 3) as controls. Models 4 and 7 are two-stage least squares estimations using the variables for SOP and the Big Five from week 2 as instruments for those from week 3. All variables except "Female" are standardized.

Table A.18. Robustness check: Relationship between optimism and risk conception questions

Specification 1	General risk question					
	(1)	(2)	(3)	(4)	(5)	(6)
Optimism (LOT - week 3)	0.241***	0.100**	0.119***	0.241***	0.228***	0.199***
	(0.054)	(0.044)	(0.044)	(0.054)	(0.052)	(0.052)
Risk - neg/pos		0.519***	0.599***			
		(0.049)	(0.045)			
Risk - stake size		0.079*		-0.006		
		(0.048)		(0.053)		
Risk - stake size (gains)		0.106**			0.249***	
		(0.046)			(0.052)	
isk - stake size (losses)		-0.189***				-0.272***
		(0.050)				(0.052)
Female	-0.273**	-0.120	-0.137	-0.273**	-0.213**	-0.263**
	(0.110)	(0.088)	(0.089)	(0.111)	(0.108)	(0.106)
Cognitive Ability (Raven)	-0.133**	-0.143***	-0.127***	-0.133**	-0.129**	-0.161***
	(0.054)	(0.043)	(0.044)	(0.054)	(0.052)	(0.052)
Constant	0.150*	0.079	0.089	0.150*	0.116	0.147*
	(0.086)	(0.068)	(0.069)	(0.086)	(0.083)	(0.082)
R^2	0.08	0.41	0.08	0.14	0.15	0.44
N	326	326	326	326	326	326

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. The dependent variables consist of the answers to the general risk question elicited on an 11-point scale. The optimism measure LOT is the Life Orientation Test elicited in week 3. All variables except "Female" are standardized.

Table A.19. Robustness check to Table 3: Alternative specifications showing the relationship between the general risk question and optimism controlling for the risk conception questions.

Specification 2	General risk question					
	(1)	(2)	(3)	(4)	(5)	(6)
Optimism (SOP - week 2)	0.255***	0.075*	0.099**	0.255***	0.250***	0.199***
	(0.053)	(0.044)	(0.044)	(0.053)	(0.051)	(0.052)
Risk - neg/pos		0.529***	0.603***			
		(0.048)	(0.044)			
Risk - stake size		0.092*		-0.004		
		(0.047)		(0.053)		
Risk - stake size (gains)		0.102**			0.257***	
		(0.046)			(0.051)	
Risk - stake size (losses)		-0.188***				-0.262***
		(0.050)				(0.052)
Female	-0.295***	-0.139	-0.153*	-0.295***	-0.241**	-0.283***
	(0.109)	(0.086)	(0.088)	(0.110)	(0.106)	(0.106)
Cognitive Ability (Raven)	-0.115**	-0.129***	-0.113***	-0.115**	-0.116**	-0.140***
	(0.053)	(0.042)	(0.042)	(0.053)	(0.051)	(0.051)
Constant	0.167*	0.080	0.089	0.167*	0.138*	0.160*
	(0.086)	(0.067)	(0.069)	(0.086)	(0.083)	(0.083)
R^2	0.093	0.452	0.422	0.093	0.157	0.156
N	335	335	335	335	335	335

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. The dependent variables consist of the answers to the general risk question elicited on an 11-point scale. The optimism measure SOP was elicited in week 2. All variables except "Female" are standardized.

Table A.20. Robustness check to Table 3 - continued: Alternative specifications showing the relationship between the general risk question and optimism controlling for the risk conception questions.

Specification 3			General risk question			
	(1)	(2)	(3)	(4)	(5)	(6)
Optimism (LOT - week 2)	0.258***	0.099**	0.115***	0.259***	0.253***	0.215***
	(0.053)	(0.043)	(0.044)	(0.053)	(0.051)	(0.052)
Risk - neg/pos		0.524***	0.601***			
		(0.047)	(0.044)			
Risk - stake size		0.090*		-0.008		
		(0.047)		(0.053)		
Risk - stake size (gains)		0.103**			0.257***	
		(0.045)			(0.051)	
Risk - stake size (losses)		-0.189***				-0.270***
		(0.049)				(0.052)
Female	-0.296***	-0.139	-0.153*	-0.296***	-0.243**	-0.282***
	(0.109)	(0.086)	(0.088)	(0.110)	(0.106)	(0.105)
Cognitive Ability (Raven)	-0.137**	-0.138***	-0.123***	-0.137**	-0.138***	-0.160***
	(0.053)	(0.042)	(0.043)	(0.053)	(0.051)	(0.052)
Constant	0.171**	0.081	0.090	0.171**	0.142*	0.162**
	(0.086)	(0.067)	(0.068)	(0.086)	(0.083)	(0.082)
R^2	0.094	0.456	0.425	0.094	0.158	0.163
N	335	335	335	335	335	335

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. The dependent variables consist of the answers to the general risk question elicited on an 11-point scale. The optimism measure LOT is the Life Orientation Test elicited in week 2. All variables except "Female" are standardized.

Table A.21. Robustness check to Table 3 - continued: Alternative specifications showing the relationship between the general risk question and optimism controlling for the risk conception questions.

	Risk premium choice list 1		
	(1)	(2)	(3)
Optimism (SOP - week 3)	-0.264**		-0.185*
	(0.102)		(0.104)
General risk question		-0.394***	-0.351***
		(0.103)	(0.105)
Female	0.217	0.114	0.120
	(0.212)	(0.211)	(0.211)
Cognitive Ability (Raven)	0.334***	0.281***	0.291***
	(0.103)	(0.103)	(0.102)
Constant	-1.804***	-1.741***	-1.745***
	(0.165)	(0.165)	(0.164)
R^2	0.047	0.069	0.078
N	348	348	348

	Risk premium choice list 2		
	(1)	(2)	(3)
Optimism (SOP - week 3)	-0.173		-0.060
	(0.107)		(0.106)
General risk question	0.747***	0.606***	0.608***
	(0.220)	(0.216)	(0.216)
Female	-0.113	-0.178*	-0.175*
	(0.107)	(0.105)	(0.105)
Cognitive Ability (Raven)		-0.517***	-0.503***
		(0.105)	(0.108)
Constant	-0.326*	-0.240	-0.241
	(0.172)	(0.168)	(0.168)
R^2	0.046	0.102	0.103
N	348	348	348

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Choice list 1 elicits the risk premium for a lottery with 25% chance of receiving 15€ and 75% chance of receiving nothing, while choice list 2 elicits the risk premium for a lottery with 50% chance of receiving 15€. The dependent variables are aggregates over measurements in weeks 1 and 3. All variables except "Female" are standardized.

Table A.22. Robustness check to Table 4:
Optimism and risk taking behavior using each risk premium separately.

	Risk premium choice list 3		
	(1)	(2)	(3)
Optimism (SOP - week 3)	-0.205*		-0.125
	(0.111)		(0.113)
General risk question	1.461***	1.359***	1.363***
	(0.230)	(0.229)	(0.229)
Female	-0.155	-0.206*	-0.199*
	(0.112)	(0.111)	(0.112)
Cognitive Ability (Raven)		-0.385***	-0.356***
		(0.111)	(0.114)
Constant	0.429**	0.492***	0.490***
	(0.180)	(0.179)	(0.179)
R^2	0.125	0.146	0.149
N	348	348	348

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. Choice list 3 elicits the risk premium for a lottery with 75% chance of receiving 15€ and 25% chance of receiving nothing. The dependent variable is an aggregate over measurements in week 1 and 3. All variables except "Female" are standardized.

Table A.23. Robustness check to Table 4 - continued:
Optimism and risk taking behavior using each risk premium separately.

	Risk premium index		
	(1)	(2)	(3)
Risk - pos/neg	-0.130***		0.028
	(0.050)		(0.063)
General risk question		-0.237***	-0.254***
		(0.049)	(0.063)
Female	0.405***	0.368***	0.369***
	(0.104)	(0.102)	(0.102)
Cognitive Ability (Raven)	0.012	-0.015	-0.017
	(0.050)	(0.049)	(0.050)
Constant	-0.232***	-0.209***	-0.210***
	(0.081)	(0.079)	(0.079)
R^2	0.07	0.11	0.11
N	348	348	348

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. The dependent variable is an aggregate over measurements in week 1 and 3. All variables except "Female" are standardized.

Table A.24. Alternative to Table 4:
Risk conception and risk taking behavior

A.11 Methods and results of additional experiment

Lottery	p	x1 in EUR	x2 in EUR
1	0.05	4	0
2	0.05	8	2
3	0.05	10	4
4	0.05	30	10
5	0.10	2	0
6	0.10	4	2
7	0.10	10	0
8	0.25	4	0
9	0.25	8	2
10	0.25	10	4
11	0.5	2	0
12	0.5	4	2
13	0.5	8	2
14	0.5	10	0
15	0.5	10	4
16	0.5	30	0
17	0.75	4	0
18	0.75	8	2
19	0.75	10	4
20	0.90	2	0
21	0.90	4	2
22	0.90	10	0
23	0.90	4	0
24	0.90	8	2
25	0.90	10	4

Notes. Each choice lists elicits the certainty equivalent of a lottery (x_1 with probability p or x_2 with probability (1-p)

Table A.25. Parametrization of the choice lists

	General risk question					
	(1)	(2)	(3)	(4)	(5)	(6)
Risk - neg/pos	0.483***	0.516***				
	(0.0720)	(0.0645)				
Risk - stake size	0.105		0.0149			
	(0.0825)		(0.0749)			
Risk - stake size (gains)	0.0192			0.171**		
	(0.0741)			(0.0764)		
Risk - stake size (losses)	-0.111				-0.204***	
	(0.0834)				(0.0738)	
Female	0.0207	0.0107	-0.163	-0.183	-0.0917	-0.161
	(0.133)	(0.132)	(0.152)	(0.150)	(0.150)	(0.151)
Cognitive Ability (Raven)	-0.0951	-0.105	-0.127*	-0.0811	-0.139*	-0.128*
	(0.0667)	(0.0640)	(0.0750)	(0.0765)	(0.0731)	(0.0743)
Constant	-0.0123	-0.00636	0.0966	0.109	0.0544	0.0954
	(0.102)	(0.101)	(0.116)	(0.115)	(0.115)	(0.116)
R^2	0.29	0.28	0.02	0.05	0.06	0.02
N	182	182	182	182	182	182

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized. The independent variables "Risk - neg/pos" to "Risk - stake size (losses)" consist of the answers to questions eliciting what subjects thought of while answering the general risk question along the dimensions of valence and stake size.

Table A.26. Relationship between the general risk question and risk conception in the additional experiment.

	Risk - neg/pos	Risk - stake size	Risk - stake size (gains)	Risk - stake size (losses)
	(1)	(2)	(3)	(4)
Optimism (SOP)	0.185***	-0.0137	0.0742	-0.033
	-0.061	-0.063	-0.061	-0.062
Female	-0.272*	0.132	0.153	0.328**
	(0.148)	(0.153)	(0.147)	(0.152)
Cognitive Ability (Raven)	-0.021	-0.115	-0.266***	-0.055
	-0.073	-0.075	-0.072	-0.075
Constant	0.005	-0.067	-0.154	-0.167
	(0.130)	(0.134)	(0.129)	(0.133)
R^2	0.08	0.02	0.09	0.03
N	182	182	182	182

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized. The dependent variables consist of the answers to questions eliciting what subjects thought of while answering the general risk question along the dimensions of valence and stake size.

Table A.27. Relationship between risk conception and optimism in the additional experiment.

	General risk question					
	(1)	(2)	(3)	(4)	(5)	(6)
Optimism (SOP)	0.399***	0.199	0.192	0.400***	0.373***	0.385***
	(0.140)	(0.125)	(0.125)	(0.140)	(0.139)	(0.137)
Risk - neg/pos		0.682***	0.733***			
		(0.109)	(0.098)			
Risk - stake size		0.145		0.024		
		(0.109)		(0.098)		
Risk - stake size (gains)		0.020			0.211**	
		(0.102)			(0.104)	
Risk - stake size (losses)		-0.170				-0.285***
		(0.121)				(0.105)
Female	-0.235	0.098	0.070	-0.240	-0.288	-0.089
	(0.339)	(0.303)	(0.299)	(0.341)	(0.337)	(0.338)
Cognitive Ability (Raven)	-0.117	-0.095	-0.105	-0.114	-0.072	-0.129
	(0.081)	(0.074)	(0.071)	(0.082)	(0.083)	(0.080)
Constant	5.544***	3.188***	2.992***	5.426***	4.388***	6.948***
	(0.540)	(0.893)	(0.582)	(0.719)	(0.782)	(0.742)
R^2	0.06	0.30	0.29	0.06	0.09	0.10
N	182	182	182	182	182	182

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. All variables except "Female" are standardized.

Table A.28. Relationship between the general risk question and optimism controlling for risk conception in the additional experiment.

	Risk premium index		
	(1)	(2)	(3)
Optimism (SOP)	-0.069		-0.046
	(0.061)		(0.063)
General risk question		-0.063*	-0.058*
		(0.032)	(0.033)
Female	0.444***	0.443***	0.430***
	(0.149)	(0.147)	(0.149)
Cognitive Ability (Raven)	-0.024	-0.028	-0.030
	(0.036)	(0.036)	(0.036)
Constant	-0.084	0.206	0.238
	(0.238)	(0.295)	(0.298)
R^2	0.06	0.08	0.08
N	182	182	182

Notes. OLS regressions. Standard errors in parentheses. * $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$. The variable "risk premium index" is created by standardizing the risk premia (aggregated over measurements in week 1 and 3), averaging, and then standardizing again. All independent variables except "Female" are standardized.

Table A.29. Optimism and Risk Taking Behavior in the additional experiment.

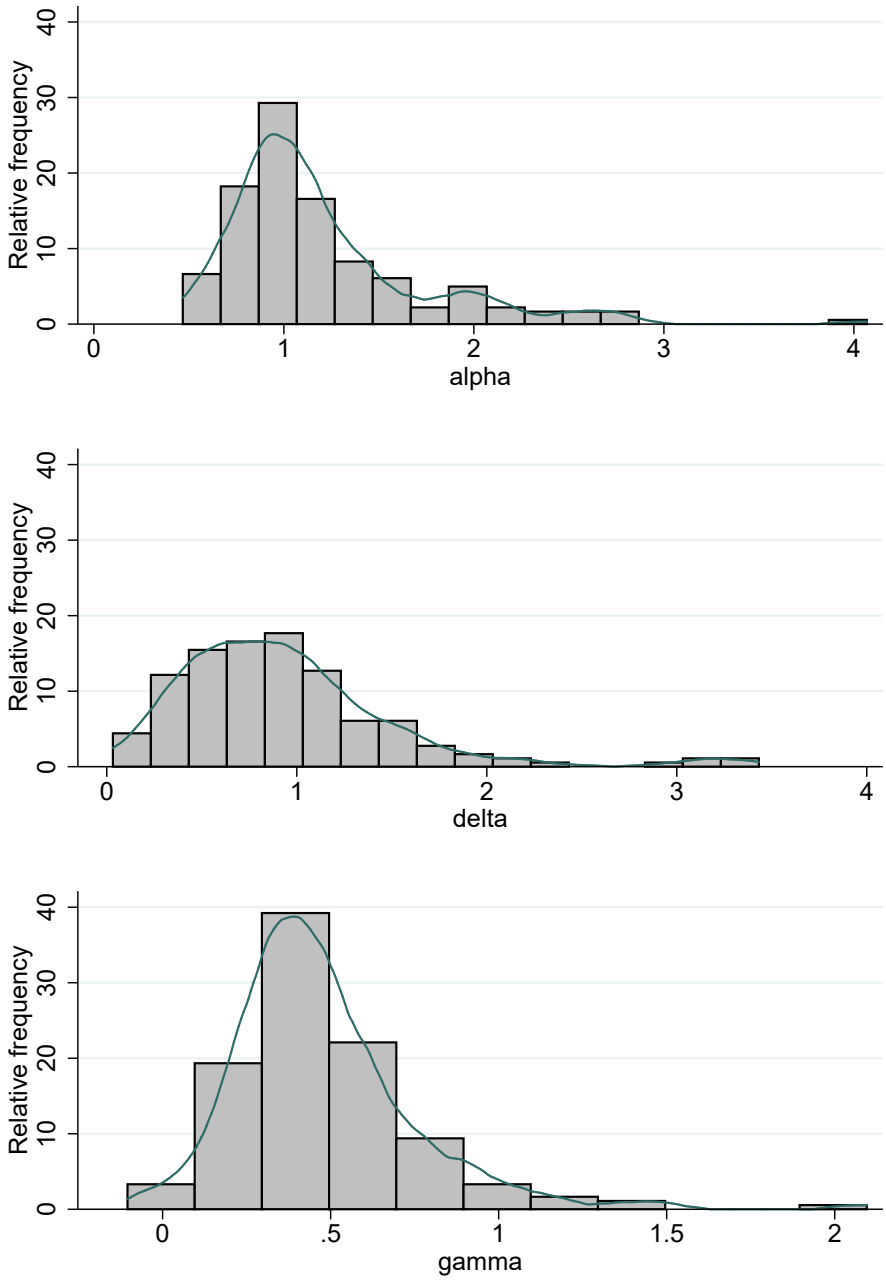

Figure A.3. Distributions of estimated parameters of the utility and probability weighting functions

A.11.1 English translation of the vignettes used in the memory measure. Both vignettes were presented to subjects in German. The German texts are available on request. The order of the vignettes and which of the two stories had a positive and which a negative outcome was balanced across subjects.

Vignette 1: "Taxi story"

You frequently have to travel to a big city. The only way to get to your final destination from the airport is by taxi. Company A charges you according to the taxi meter. Company B charges you a fixed price. If the roads are not too busy, taking Company A is cheaper for you. However, if there is congestion, the drivers of both companies have to take a longer route, which makes company B cheaper for you. Today, you choose Company A that charges you by the meter. Since there is hardly any traffic, you pay less than you would have had to pay with Company B. [Since there is a lot of traffic, you pay more than you would have had to pay with Company B.]

Vignette 2: "Train story"

Imagine you take the train to visit a friend in a city a substantial distance from your home town. You have a choice between two connections which are both covered by your train ticket and start at exactly the same time: Connection A and Connection B. For both you have to make one transfer. Connection A has a very short transfer time, while Connection B has a modest transfer time. Connection A is faster than Connection B if the first train is perfectly on time. If it is only a few minutes late, however, you will miss your connecting train and have to wait for the next one. In this case your travel time will be longer than with Connection B. You choose to take Connection A. Since the first train is perfectly on time, you reach your connecting train and arrive at your friend's house earlier than if you had taken Connection B. [Since your first train is a little late, you miss your connecting train and arrive at your friend's house later than if you had taken Connection B.]