Measuring is knowing?

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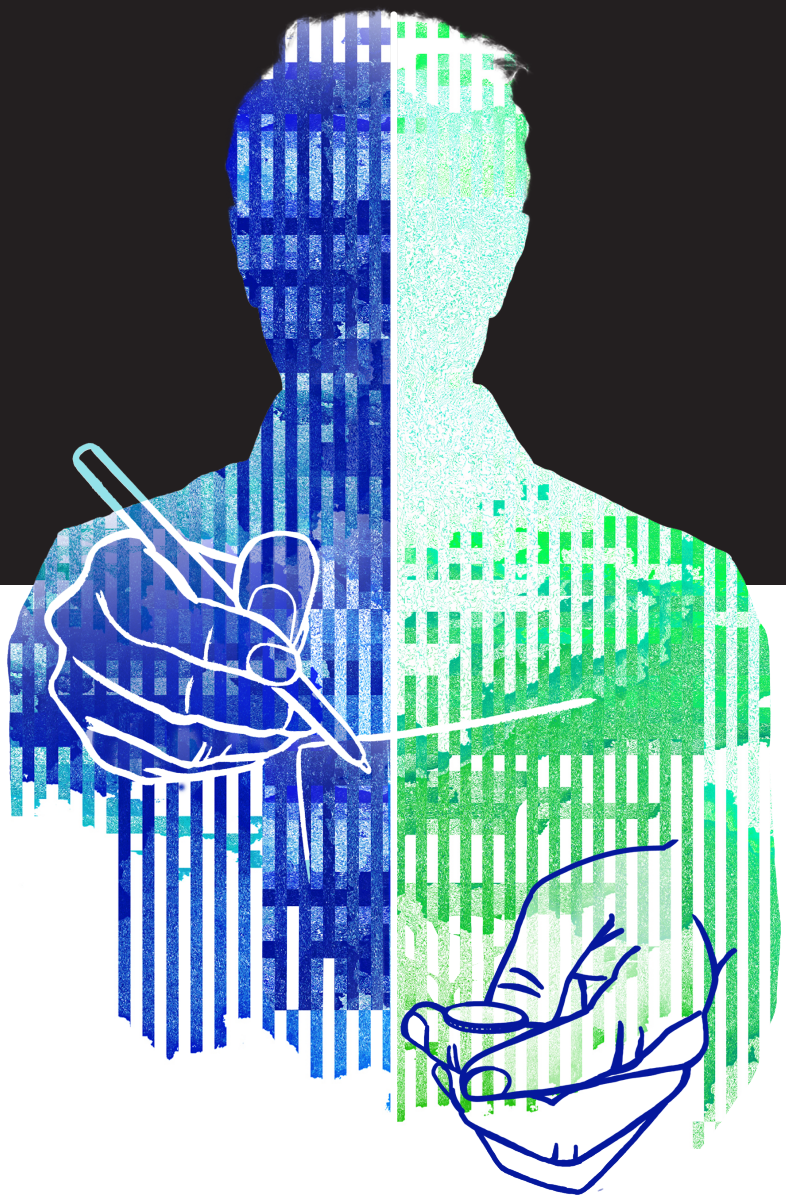
Eliciting Preferences in the General Population



Paul Bokern

Doctoral thesis

MEASURING IS KNOWING?

Eliciting Preferences in the General Population

Paul K. Bokern

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MEASURING IS KNOWING?

Eliciting Preferences in the General Population

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To Nina and Tedje

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Paul K. Bokern
Maastricht, March 2024

Summary

Preferences are fundamental characteristics of individuals and have been shown to be predictive of decisions in a variety of domains. For example, people's willingness to take risks (risk preferences) has been shown to affect investment and occupational decisions. The willingness to defer immediate gratification (time preferences) is related to saving and retirement decisions, and caring about others (social preferences) affects donating behavior and attitudes toward redistribution. This thesis is about measuring preferences in a general population sample of the Netherlands. Preferences are elicited with methods that ask people to make actual decisions, usually with real (financial) incentives, from which preferences are inferred (revealed preferences), and methods that ask people to state their own perception of their preferences (stated preferences). The thesis contributes to a better understanding of (i) the validity of measures, (ii) the stability of measures after experiencing life events and during a crisis, and (iii) differences between self-employed workers and employees in their preferences.

Chapter 2 examines whether measures from different risk preference elicitation methods correlate with each other (convergent validity) and with field behavior (external validity). Previous literature suggests that stated methods perform better than revealed methods in terms of convergent and external validity when it comes to measuring risk preferences. One critique of this literature is that measurement error is often not properly accounted for. Measurement error can occur, for instance, because of varying attention and focus of participants. A contribution of this study is that we correct measurement error using a method that was recently proposed in the literature. We find that the correlation between methods improves when controlling for measurement error. This provides an indication that not accounting for measurement error can partly explain the lack of convergent validity among revealed risk preference elicitation methods found in previous studies. At the same time, we find clear differences between stated and revealed methods when it comes to their external validity. Revealed methods do not correlate well with risk-related field behavior, even when controlling for measurement error. Stated methods correlate with most types of risk-related field behavior and correlations are of economic significance. Thus, measurement error appears insufficient to explain why the external validity of incentivized risk preference elicitation methods is generally found to be low.

Chapters 3 and 4 investigate the stability of preferences after personal life events and during the COVID-19 crisis, respectively. Stable preferences are often implicitly assumed, but it is important that this assumption is validated empirically. Chapter 3 examines the effect of (recent) marriage, divorce, and parenthood on risk, time, and social preferences. The findings suggest that there are only some short-lasting effects of personal life events on preferences. Importantly, however, the results from revealed and stated preference methods largely do not coincide. Chapter 4 examines the effect of the COVID-19 crisis on preferences. Preferences were measured right before and over a one-year period during the COVID-19 pandemic. The findings from this study suggest that preferences remained remarkably stable throughout the pandemic. The results from both studies are encouraging from a theoretical and a practical point of view as they support the assumption of stable preferences. However, more research is needed to investigate why the literature on these topics is far from conclusive.

Chapter 5 compares the preferences and traits of self-employed workers and employees. The study contributes to question "Who are the self-employed?". The question has been studied before but remains relevant because the labor market is constantly changing and the characteristics of self-employed workers vary across countries and time. The results show that self-employed workers state to be more patient compared to employees but behave equally or less patiently in revealed preference methods. In addition, self-employed workers in our sample are found not to differ from employees in terms of self-control and financial literacy, contrasting results from previous studies. Other findings suggest that self-employed workers are more willing to take risks (as inferred from both stated and revealed methods), are more optimistic, and have lower trust in institutions but higher trust in other people.

Samenvatting

Voorkeuren zijn fundamentele kenmerken van personen waarvan is aangetoond dat ze voorspellend kunnen zijn voor keuzes in diverse situaties. De bereidheid om risico's te nemen (risicovoorkeuren) heeft bijvoorbeeld invloed op investerings- en beroepsbeslissingen. Geduld (tijdsvoorkeuren) is gerelateerd aan sparen en pensioenbeslissingen, en het geven om anderen (sociale voorkeuren) beïnvloedt donatiegedrag en opvattingen over inkomensongelijkheid. In dit proefschrift staan voorkeuren centraal en worden deze gemeten in een steekproef van de Nederlandse bevolking. Voorkeuren worden gemeten met methoden die mensen vragen beslissingen te nemen, meestal met echte (financiële) prikkels, waaruit voorkeuren worden afgeleid (zogenoemde *revealed* methoden) en methoden waarbij mensen worden gevraagd om aan te geven hoe ze hun eigen voorkeuren zien (zogenoemde *stated* methoden). Het proefschrift draagt bij een aan beter begrip van (i) de validiteit van meetmethodes, (ii) de stabiliteit van meetmethodes na levensgebeurtenissen en tijdens een crisis en (iii) verschillen tussen zelfstandigen en werknemers in hun voorkeuren.

Hoofdstuk 2 onderzoekt de convergente- en externe validiteit van risicovoorkeur meetmethoden. Uit eerder onderzoek komt naar voren dat voor het vaststellen van risicovoorkeuren *stated* methoden te prefereren zijn boven *revealed* methoden als het gaat om convergente- en externe validiteit. Een punt van kritiek op deze studies is dat vaak geen rekening wordt gehouden met meetfouten. Meetfouten kunnen bijvoorbeeld optreden door variatie in aandacht en focus van deelnemers. In dit onderzoek corrigeren we voor meetfouten met behulp van een methode die recentelijk is aanbevolen. We vinden dat de correlatie tussen de verschillende risicovoorkeur meetmethoden verbetert als gecontroleerd wordt voor meetfouten. Daaruit blijkt dat het niet corrigeren voor meetfouten een gedeeltelijke verklaring kan zijn voor het eerder gevonden gebrek aan convergente validiteit. Tegelijkertijd vinden we duidelijke verschillen tussen *revealed* en *stated* methoden ten aanzien van externe validiteit. *Revealed* methoden correleren niet goed met risico gerelateerd gedrag in de "echte" wereld, zelfs als gecorrigeerd wordt voor meetfouten. *Stated* methoden daarentegen correleren met de meeste soorten risico gerelateerd gedrag en de correlaties zijn inhoudelijk van betekenis. Meetfouten bieden dus geen afdoende verklaring waarom de externe validiteit van *revealed* risicovoorkeur meetmethoden over het algemeen laag is.

Hoofdstuk 3 en 4 onderzoeken respectievelijk de stabiliteit van voorkeuren na levensgebeurtenissen en tijdens de COVID-19 crisis. Stabiele voorkeuren worden vaak impliciet verondersteld, maar het is belangrijk dat deze veronderstelling empirisch wordt gevalideerd. Hoofdstuk 3 onderzoekt het effect van een (recent) huwelijk, scheiding en ouderschap op risico-, tijds- en sociale voorkeuren. De bevindingen tonen aan dat er slechts enkele kortdurende effecten zijn. Belangrijk is echter dat de resultaten van de *revealed* en *stated* methoden grotendeels niet overeenkomen. Hoofdstuk 4 onderzoekt het effect van de COVID-19 crisis op voorkeuren. Voorkeuren werden vlak voor en op verschillende momenten gedurende de COVID-19 pandemie gemeten. De bevindingen van deze studie laten zien dat voorkeuren opmerkelijk stabiel bleven tijdens de pandemie. De resultaten van beide onderzoeken zijn bemoedigend vanuit een theoretisch en praktisch oogpunt omdat ze de veronderstelling ondersteunen dat voorkeuren stabiel zijn. Meer onderzoek is echter nodig om na te gaan waarom er in de literatuur geen consensus is over de mate waarin voorkeuren stabiel zijn.

Hoofdstuk 5 vergelijkt zelfstandigen en werknemers met betrekking tot hun voorkeuren en eigenschappen. Het onderzoek draagt bij aan een beter begrip over zelfstandigen. Onderzoek naar zelfstandigen blijft relevant omdat de arbeidsmarkt voortdurend verandert en de kenmerken van zelfstandigen variëren per land en door de tijd heen. Onze bevindingen laten zien dat zelfstandigen geduldiger zeggen te zijn dan werknemers, terwijl uit de *revealed* methoden blijkt dat ze zich even geduldig of zelfs minder geduldig gedragen. Daarnaast verschillen zelfstandigen in ons onderzoek niet van werknemers op het gebied van zelfcontrole en financiële kennis in tegenstelling tot bevindingen van eerdere studies. Tevens blijkt dat zelfstandigen meer bereid zijn om risico's te nemen (zowel in *revealed* en *stated* methoden), optimistischer zijn en minder vertrouwen hebben in publieke en private instituties maar meer vertrouwen in andere mensen.

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1
Introduction

> Tastes are the unchallengeable axioms of a man's behavior: he may properly (usefully) be criticized for inefficiency in satisfying his desires, but the desires themselves are data. (Stigler & Becker, 1977, p .76)

Preferences are fundamental characteristics of individuals and have been shown to predict life outcomes in a variety of domains (Golsteyn & Schildberg-Hörisch, 2017). Consider the well-known "marshmallow test" developed in the 1960s. In this experiment, preschool children were seated alone in a room with in front of them an immediately available reward (e.g., a single marshmallow). The children were given the choice to consume the reward right away or wait until the experimenter returned to receive a larger reward (e.g., two marshmallows). Studies using this type of design have found, among others, that children who were able to defer immediate gratification (i.e., eating the one marshmallow) scored higher on standardized college admissions exams, attained higher education, and were less likely to be overweight, years after the experiment (Mischel et al., 2010). These results suggest that the decision to wait in such experiments captures a fundamental characteristic of the individual, which is predictive of outcomes in various other domains of life.[1]

The marshmallow test concerns intertemporal choices between an immediate and delayed reward. Such preferences over temporal trade-offs are called time preferences in economics and are considered one of the fundamental economic preferences (J. Cohen et al., 2020). Two other key dimensions of economic preferences are risk and social preferences (Golsteyn & Schildberg-Hörisch, 2017). Risk preferences refer to the extent to which people are willing to take on risks (Charness et al., 2013).[2] Social preferences capture the extent to which people care about the well-being of others in addition to their

[1] There has been some debate about the validity and reproducibility of the marshmallow test. However, discussions by Duckworth et al. (2013) and Falk et al. (2020) provide compelling arguments in support of the results.

[2] It is important to note that risk has a different meaning in economics as compared to the standard dictionary definition. In the dictionary, risk refers to the possibility of harm, injury, or loss (Friedman et al., 2014). In economics, risk more commonly refers to variance in outcomes. To illustrate, suppose that someone is asked to choose between €200 for sure and receiving either €100 or €300 with an equal chance. The expected value is €200 in both options, whereas the variance of the outcome is larger in the latter option. Risk preferences determine the (un)willingness to choose options with higher variance. In this example, the person should choose the certain option if they are risk-averse, the risky option if they are risk-seeking, and be indifferent if they are risk-neutral. Note that in this example there is no possibility of loss, taking the lottery will always make you better off (in terms of money).

own self-interest (List, 2009). A common thread in this thesis is that all chapters deal with the elicitation of risk, time, and social preferences in a general population sample of the Netherlands.

A critical aspect of preferences is that they are latent, meaning that they are not directly observable. Economists and psychologists have developed numerous methods to elicit preferences. These methods can broadly be categorized into revealed and stated methods. Revealed preference methods ask people to make actual decisions, usually with real (financial) incentives, from which preferences are inferred. The marshmallow test is an example of such a revealed preference method, where preferences are inferred from the choice between an immediate and delayed reward, and marshmallows act as the incentive. Stated preference methods ask people to state their own perception of their preferences or how they would behave in certain situations. For time preferences, one could ask "On a scale from 0 to 10, how willing are you to give up something that is beneficial for you today in order to benefit more from that in the future?" (Falk et al., 2016, 2022).

Economists generally advocate using revealed preference methods, because real consequences should incentivize people to respond truthfully (e.g., Smith, 1982). However, a drawback of revealed preference methods is that they can be costly and difficult to implement, especially in large population samples (Dohmen et al., 2011). Stated preference methods, on the other hand, are relatively cheap and easy to administer. However, critics argue that, due to the lack of incentives, responses could be distorted because of various factors, such as inattention, self-serving biases, or strategic motives (Dohmen et al., 2011). It is ultimately an empirical question what the relative strengths and weaknesses of revealed and stated methods are, as well as how they could complement each other (Mata et al., 2018). The second common thread of this thesis is that we elicit risk, time, and social preferences with both revealed and stated preference methods (except in Chapter 4), which allows us to compare the results from the different methods.

An important consideration of any method to elicit preferences is that the measurement is *valid*. Validity refers to the extent to which a method measures what it is intended to measure (Price et al., 2015). Three important criteria to assess a measure's validity are temporal (or test-retest) stability, convergent validity, and external (or predictive) validity (e.g., Borghans et al., 2008; Golsteyn and Schildberg-Hörisch, 2017; Mata et al., 2018). Temporal stability concerns the degree to which a measure produces stable results over time. If a method produces highly inconsistent results when used at

different points in time, then it cannot be a good measure of the underlying characteristic that is assumed to be stable. Convergent validity concerns the extent to which different measures of the same construct capture a common underlying characteristic. If a measure is intended to capture an underlying characteristic, then we should expect it to correlate with other measurements of the same underlying characteristic. External validity refers to the extent to which a measure is predictive of actual behavior that should be affected by the underlying characteristic. If a measure fails to predict "real-world" behavior that should be affected by the underlying characteristic, then it is most likely not a good measure. The topic of validity is addressed in Chapter 2 which discusses the convergent and external validity of risk preference elicitation methods.

In sum, this thesis is about measuring preferences in a general population sample using revealed and stated preference methods and assessing the validity of preference elicitation methods. We apply a lab-in-the-field methodology where we study the general population yet maintain control over the decisions that people make (Gneezy et al., 2017). This type of study complements lab studies that offer more control but are typically done on student samples. Student samples are more homogeneous and results do not necessarily generalize to the general population (Hanel & Vione, 2016). Lab-in-the-field studies, therefore, contribute to a better understanding of the generalizability of results in lab studies.

Chapters 2, 3, and 5 concern the same sample of individuals. These data were collected in a two-wave online survey in May and June of 2020 in collaboration with Statistics Netherlands, who drew the sample, and research agency Flycatcher, who programmed the survey and collected the data. A total of 18,000 Dutch employees and 18,000 Dutch self-employed workers in the Netherlands were randomly selected and invited through physical letters to participate in the study.[3] The final sample consists of 4,282 participants, who fully completed both waves of the survey. Chapter 4 concerns data that were collected at four different points during the COVID-19 crisis in the years 2020 and 2021. These data were collected in collaboration with research agency Flycatcher and the sample was drawn from their participant pool which consists of Dutch residents with a variety of backgrounds. A total of 1,035 Dutch residents participated in this study.

[3]The work in this thesis is part of a larger project, which focuses explicitly on the self-employed, and hence self-employed workers were over-sampled. We exploit this setup in Chapter 5.

Outline

Chapter 2 examines the convergent and external validity of risk preference elicitation methods. Previous literature suggests that stated risk preference elicitation methods perform better than revealed risk preference elicitation methods when it comes to temporal stability, convergent validity, and external validity (Friedman et al., 2014; Mata et al., 2018). One potential explanation for the relatively poor performance of revealed preference methods is given by Gillen et al. (2019), who suggest that measurement error is not properly accounted for in experimental work. Errors in measurement can occur, for instance, because of random variation in the attention and focus of participants. In line with this, Gillen et al. (2019) show in a sample of students that revealed risk preference elicitation methods perform better on convergent validity once measurement error is accounted for. We contribute to the literature by building on the work of Gillen et al. (2019) and evaluating both the convergent and external validity of risk preference elicitation methods in a general population sample while controlling for measurement error.

Chapter 3 investigates whether changes in marital status and parenthood are associated with changes in risk, time, and social preferences. Personal life events such as marriage, divorce, and parenthood can have a substantial impact on how people live their lives. An important question is whether such shocks affect people's preferences. Our contribution is threefold. First, we contribute to a better understanding of the stability of preferences after personal life events. While risk preferences have received quite some attention in the literature, less is known about the impact of personal life events on time and social preferences. Second, preferences are elicited with both revealed and stated preference methods, whereas existing studies mostly rely on self-reports. This allows us to examine whether conclusions differ depending on the elicitation method used. Third, we identify life events with register data rather than self-reports, which is likely to reduce reporting errors and identify life events in an inconspicuous manner. To the best of our knowledge, our study is the first that investigates the impact of personal life events on such a wide range of preference measures and compares the results of stated and revealed preference methods.

Chapter 4 examines the temporal stability of risk, time, and social preferences during the COVID-19 pandemic. The COVID-19 pandemic impacted people all over the world through substantial health risks and adverse effects on the economy and society. Given the importance of preferences for economic and social behavior, it is important to understand if and how they are affected by

exogenous shocks, such as the COVID-19 pandemic. We make several contributions to the literature. First, our participant pool consists of a large general population sample. Second, we consider a wide range of preferences using different incentivized experimental tasks. Third, preferences were elicited before the onset of the crises and in three waves during the crises over a time period of more than a year, allowing us to investigate both short-term and medium-term preference responses. Fourth, besides the measurement of causal effects of the crisis, we also analyze within each wave during the crisis, how differential exposure to the crisis in the health, career, and financial domain affects preferences.

Chapter 5 compares self-employed workers and employees in the Netherlands with respect to individual preferences and traits. The goal of the study is to provide a comprehensive and recent picture of the question "Who are the self-employed?". Although the question has been studied before, it remains relevant because the labor market is constantly changing and the individuals who comprise the group of self-employed vary across countries and time. Therefore, several authors have argued that it is important to keep research on self-employment up-to-date and test "established" relationships (Cowling et al., 2019; Simoes et al., 2016). Our main contribution is that our survey contains measures of a rich set of preferences and traits, including economic preferences, social preferences, personality traits, and cognitive traits, allowing us to draw an extensive picture of the differences between the two groups. Additionally, we measure preferences both with incentivized economic experiments and self-assessed survey questions, so that we can compare results from different elicitation methods.

The thesis concludes with a general discussion of the findings and an impact paragraph that reflects on the scientific contribution as well as its impact on society in general.

2

The Validity of Risk Preference Elicitation Methods

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Abstract

We evaluate the convergent and external validity of several commonly used risk preference elicitation methods with and without controlling for measurement error using the obviously related instrumental variable (ORIV) approach (Gillen et al., 2019). Risk preferences are elicited in a large sample of the Dutch population ($N = 4,282$) and linked to field behavior in financial, occupational, and health domains based on register data and survey questions. We find that controlling for measurement error improves the correlation between methods, suggesting that not accounting for measurement error can partly explain the lack of convergent validity among risk preference elicitation methods found in previous studies. At the same time, we find clear differences between revealed and stated preference methods in terms of their external validity. Stated methods correlate well with most types of field behavior and correlations are of economic significance. In addition, controlling for measurement error increases the strength of the relationships found. Revealed methods are at best weakly related to field behavior, even when controlling for measurement error. The difference between revealed and stated methods appears not to be driven by the higher complexity of the incentivized tasks used to elicit revealed risk preferences.

2.1 Introduction

Risk plays an important role in many economic decisions, such as investing, occupational choice, and health matters. Understanding and predicting how individuals make decisions in such situations requires knowledge of their risk preferences. Consequently, both economists and psychologists have proposed numerous methods that aim to uncover people's risk preferences (e.g., Charness et al., 2013; Harrison and Rutström, 2008). A question that remains unsettled, however, is which method captures an individual's risk preference "best" (Eckel, 2019; Mata et al., 2018). In this study, we evaluate several commonly used risk preference elicitation methods concerning their correlation with each other (convergent validity) and their relationship with risk-related decisions in the field (external validity), while controlling for measurement error.

Risk preference elicitation methods can broadly be divided into the categories of revealed and stated preference methods. Revealed preference methods require people to make actual decisions under risk, usually with real (financial) incentives. Stated preference methods ask people to state their own perception of how willing they are to take risks or ask people to state the likelihood that they engage in certain risky behavior. Economists generally advocate using revealed preference methods, because real (financial) consequences should incentivize people to respond truthfully. On the other hand, stated preference methods rely on self-awareness and honesty (Eckel, 2019).

Despite the intuitive appeal of revealed preference methods, there is little evidence showing that they are superior to stated preference methods at capturing risk preferences. In fact, Mata et al. (2018) review the empirical evidence and argue that revealed preference methods generally perform worse than stated preference methods in terms of temporal stability, convergent validity, and external validity, three conceptual issues relevant to measuring personality traits.[1] They conclude that many important phenomena related to measuring risk preferences are still insufficiently understood and call for more research on (i) understanding the lack of convergent validity among revealed and between revealed and stated risk preference elicitation methods and (ii) the relative external validity of revealed and stated risk preference elicitation methods, two topics that we will address in this chapter.

[1] Temporal stability refers to the degree that a trait is stable over time, which is not discussed in this chapter. See Schildberg-Hörisch (2018) for a discussion of the literature.

Friedman et al. (2014) are even more critical of revealed risk preference elicitation methods, stating: "After almost seven decades of intensive attempts to generate and validate estimates of parameters for standard decision theories, it is perhaps time to ask whether the failure to find stable results *is* the result." (p.7). Their extensive review of the literature highlights several regularities. First, different revealed preference methods often yield different patterns of risk preferences (see e.g., P. He et al., 2018, Holzmeister and Stefan, 2021, and Pedroni et al., 2017 for more recent work). Second, risk preferences inferred from revealed preference methods often do not correlate or correlate only weakly with field behavior or other decisions in the laboratory (see e.g., Bokern, Linde, Riedl, Schmeets, et al., 2021 and Charness et al., 2020 for more recent work). Finally, revealed risk preference methods are often sensitive to contextual factors that should not matter theoretically, such as framing effects, stake size, and payment procedure (see also Friedman et al., 2022).

A potential explanation for the poor performance of revealed risk preference elicitation methods is provided by Gillen et al. (2019), who show that not accounting for measurement error can substantially affect the results and implications of experimental work. To correct measurement error, they propose the obviously related instrumental variable (ORIV) approach, a convenient statistical tool that can be applied when multiple measurements of the same elicitation method are available. They illustrate their method in several domains, including the measurement of risk preferences. Specifically, they elicit risk preferences using four elicitation methods in a large student sample ($N = 819$) and show that ORIV corrected correlations between the methods are substantially larger than those found by conventional correlation analysis.[2] It is an open question whether controlling for measurement error using ORIV also increases the external validity of revealed risk preference elicitation methods.[3]

Our main contribution is that we assess both the convergent and external validity of several revealed and stated risk preference elicitation methods in a large and heterogeneous population sample of more than 4,000 participants

[2] Gillen et al. elicit risk preferences with the investment task (Gneezy and Potters, 1997), the gamble choice task (Eckel and Grossman, 2002), a multiple price list in the spirit of M. Cohen et al. (1987), and the general risk question (Dohmen et al., 2011). Correlations between risk preference measures, simply measured in the units of the elicitation method, range from .13 to .47 when not controlling for measurement error and range from .19 to .71 when applying ORIV.

[3] Beauchamp et al. (2017) investigate the effect of controlling for measurement error on the external validity of risk preference elicitation methods, but only consider stated risk preference methods and hypothetical lottery questions.

while controlling for measurement error using ORIV. We elicit risk preferences with the convex time budget method (Andreoni and Sprenger, 2012a), three types of multiple price lists (in the spirit of Holt and Laury, 2002; M. Cohen et al., 1987; and Drichoutis and Lusk, 2016), and the general and domain-specific risk questions introduced by Dohmen et al. (2011). External validity is assessed by linking the elicited risk preferences to naturally-occurring field behavior that reflects the risk individuals are willing to take in various domains of their everyday lives. Our field behavior measures are based on register data from Statistics Netherlands (savings, investments, debt, and self-employment) and self-collected survey data (following COVID-19 recommendations on social distancing and handwashing). The majority of our field behavior measures are thus extracted from register data, contrasting much of the literature that assesses external validity with stated field behavior only (see Bokern, Linde, Riedl, Schmeets, et al., 2021 for a recent survey).[4] An advantage of register data is that it does not rely on the recall of participants, meaning that it is less noisy and does not suffer from non-response bias.

In terms of convergent validity, we find that controlling for measurement error improves the correlation between revealed preference methods (raw correlations range from $r = .20$ to $r = .45$, whereas ORIV corrected correlations range from $r = .30$ to $r = .88$), corroborating the results of Gillen et al. (2019) in a general population sample. Correlations between stated preference methods (raw: $r = .35$ to $r = .62$, ORIV: $r = .53$ to $r = .94$) and between revealed and stated methods (raw: $r = .09$ to $r = .26$, ORIV: $r = .11$ to $r = .39$) similarly improve when controlling for measurement error.

In terms of external validity, we find clear differences between revealed and stated preference methods. Stated methods correlate strongly with risk-related field behavior both with and without controlling for measurement error. Specifically, all stated methods have a statistically significant association with at least six out of seven types of field behavior that we investigated and most of these associations are of economic significance. For example, when controlling for measurement error, we find that a one-standard-deviation increase in the willingness to take risks in financial matters is associated with an 11 percentage point increase in the probability of having investments, corresponding to a 37% increase relative to the unconditional probability. In contrast, revealed methods are

[4] The exception is Beauchamp et al. (2017) who consider one measure of field behavior extracted from register data, as discussed in Section 2.2.

at best weakly related to risk-related field behavior, even when controlling for measurement error. Specifically, revealed methods have a statistically significant association with at most three out of seven types of field behavior that we investigated and associations tend to be relatively small in terms of economic significance. Comparing estimates from specifications where we control for measurement using ORIV to those where we do not, we find that ORIV mainly affects the effect size of the estimates but not their statistical significance. Finally, we show that there is little evidence that our results are driven by the higher complexity of the experimental tasks.

The remainder of this chapter is structured as follows. Section 2.2 discusses related literature. Section 2.3 describes the procedures and data. Section 2.4 presents the empirical strategy and results. Section 2.5 checks whether our results may be driven by the higher complexity of the experimental tasks. Section 2.6 provides a discussion and concludes.

2.2 Related Literature

There are a number of studies that examine the convergent validity and/or the external validity of risk preference elicitation methods. We briefly review recent studies that, similar to ours, investigate both the convergent and external validity of risk preference elicitation methods in a general population sample.[5]

The study closest to ours is Beauchamp et al. (2017) which investigates the effect of controlling for measurement error (using a latent-variable model) on the external validity of risk preference elicitation methods in a population of Swedish Twins ($N = 11,418$). The main difference with our study is that they elicit risk preferences only with stated methods or hypothetical questions. In particular, they use the general and financial risk questions (Dohmen et al., 2011) and hypothetical lottery questions (Barsky et al., 1997; Tversky and Kahneman, 1992). The external validity of the risk preference methods is assessed by considering five field behavior measures (one based on register data) in financial, occupational, and health domains. They find that risk preferences are strongly associated with most types of field behavior. Moreover, the estimated effect sizes increase substantially after controlling for measurement error.

[5]More extensive reviews are for instance provided by Mata et al. (2018) and Friedman et al. (2014) for convergent validity and Bokern, Linde, Riedl, Schmeets, et al. (2021) for external validity.

A number of other studies similarly assess the convergent and external validity of multiple revealed and stated risk preference elicitation methods in a general population sample. In contrast to our study, however, they do not control for measurement error and only consider stated field behavior. Galizzi et al. (2016) elicit risk preferences using a within-subject design with two multiple price lists (Holt and Laury, 2002), a gamble choice task (Eckel and Grossman, 2002), and the general, financial, and health risk questions (Dohmen et al., 2011) in a representative sample of the UK ($N = 661$). They report Pearson correlations of .12 to .19 between different revealed preference methods and $-.02$ to .17 between revealed and stated preference methods. Pearson correlations between stated preference methods are higher, ranging from .42 to .62. Comparing the two multiple price lists with different stakes, thus in a within-method comparison, they report a Pearson correlation of .67. They assess the external validity of the risk preference elicitation methods by considering eight stated field behavior measures in the financial and health domain. The evidence is mixed, but no method has a statistically significant correlation (at the five percent level) with more than two types of field behavior.

Menkhoff and Sakha (2017) elicit risk preferences using a within-subject design with a multiple price list (M. Cohen et al., 1987), two gamble choice tasks (Eckel and Grossman, 2002), an investment task (Gneezy and Potters, 1997), a set of hypothetical lottery questions (Barsky et al., 1997), and the general and financial risk questions (Dohmen et al., 2011) in a sample of rural households in Thailand ($N = 760$). They report Pearson correlations of .03 to .10 between different revealed preference methods, $-.01$ to .20 between revealed and stated preference methods, and .09 to .36 between stated preference methods. Comparing the two gamble choice tasks, thus in a within-method comparison, they report a Pearson correlation of .44. The authors consider eleven types of stated field behavior in financial, occupation, and health domains to assess the external validity of the risk preference elicitation methods. They find mixed results, but no method has a statistically significant correlation (at the five percent level) with more than three types of field behavior. Moreover, they note that the economic significance of the relationships they find is relatively low.

Charness et al. (2020) elicit risk preferences using a between-subject design with a multiple price list (Holt and Laury, 2002), an investment task (Gneezy and Potters, 1997), a gamble choice task (Eckel and Grossman, 2002), a set of multiple price lists developed by Tanaka et al. (2010), and the general and financial risk questions (Dohmen et al., 2011) in a representative sample of

the Netherlands ($N = 1,122$). Based on pairwise comparisons using two-sided t-tests, they conclude that there is no consistency between incentivized methods, meaning that the methods yield different risk preference parameter estimates on average. External validity is assessed by considering three types of laboratory behavior and six types of stated field behavior in the domain of financial and occupational domains. They find that most methods correlate with laboratory behavior, although simpler methods perform better than more complex ones. Strikingly, none of the risk preference methods has a statistically significant association with any of the stated field behavior measures.

2.3 Procedures and Data

We start by introducing our sample and data collection procedures. Then, we discuss our revealed and stated risk preference elicitation methods. Lastly, we describe our field behavior measures.

2.3.1 Data Collection

The data were collected in a two-wave online survey in May and June of 2020, carried out in collaboration with Statistics Netherlands and research agency Flycatcher.[6,7] A total of 18,000 Dutch employees and 18,000 self-employed were randomly selected and invited through physical letters to participate in the online study (see Appendix 2.C for screenshots of the letters translated to English).[8] In total, 4,282 Dutch residents completed both waves. Data from the survey are enriched with demographic and socioeconomic variables from register data of Statistics Netherlands. Table 2.1 reports basic demographics of the sample.

[6] Statistics Netherlands drew the sample, which allowed us to link the survey and experimental data with register data. Flycatcher programmed the online survey and experiments and collected the data.

[7] The data collection took place during the first COVID-19 lockdown in the Netherlands. We provide evidence in Bokern, Linde, Riedl, and Werner (2021) that this did not have a large impact on participants' behavior in the incentivized experiments.

[8] The survey was part of a larger project "Understanding and Improving Pension Savings", which focused explicitly on the self-employed and hence self-employed individuals were over-sampled. The study also collected a wide range of other incentivized experiments and survey measures, not reported here. A complete overview of the material is available at http://bit.ly/pbbs-main.

Table 2.1: Descriptive Statistics - Individual and Household Characteristics

	Mean	SD	Min	Max	N
Individual Characteristics					
Sex (1=female)	0.43	0.50	0	1	4,282
Age	47.55	12.20	20	87	4,282
Breadwinner (1=yes)	0.61	0.49	0	1	4,282
Migration Background (1=native)	0.87	0.34	0	1	4,282
Marital Status (1=married)	0.59	0.49	0	1	4,282
Children (1=yes)	0.67	0.47	0	1	4,282
Household Characteristics					
Income	44,350	80,122	-23,839	4,844,076	4,276
Wealth Savings	57,746	104,128	0	1,956,581	4,276
Wealth Investments	25,685	179,765	0	8,453,932	4,276
Wealth Other	483,300	795,237	-382,597	18,517,955	4,276

Notes: Data refers to January 1, 2020 (for the variables breadwinner, children, wealth, and income) or to the date the participant filled in the second wave of the survey (for the variables age and marital status). Breadwinner is defined as the member of the household with the highest personal income. Migration background indicates whether both parents were born in the Netherlands or not. Marital status is either married (incl. registered partnership) or single (incl. divorced and widowed). Household income refers to spendable income adjusted for the size and composition of the household, it may be negative for self-employed individuals who incurred losses with their businesses. Wealth other is total wealth minus savings and investments, and includes, for instance, housing wealth and wealth from own business.

Risk preferences were elicited with four incentivized revealed preference methods and four stated preference methods, discussed below (see Appendix 2.D for more details). All participants completed the same set of measures in the same order. The median completion time was 46 and 51 minutes respectively in waves 1 and 2. One in five participants, among those who completed both waves, was randomly selected for payment based on their decisions in one randomly selected incentivized task. Possible earnings ranged from €0 up to €186 depending on the task. The average earning among the participants selected for payment was €77.10 ($SD = 41.33$).[9] In addition, one iPad was raffled off among the participants who completed

[9]The average earnings over all participants are therefore €15.42, which is approximately 50% above the net hourly minimum wage in the Netherlands at the time (the minimum wage in 2020 was €9.70 per hour for a 40-hour workweek, see https://bit.ly/wage-Dutch, last retrieved May 2023). Our decision to pay one random choice to only 1 out of 5 participants was motivated by the aim to have a large sample size as well as sizeable absolute stakes given our budget constraint. Empirical evidence suggests that paying only a subset of participants has only a minimal effect on motivation (Charness et al., 2016). Moreover, it is recommended to pay one random decision in the type of experiments we ran (Azrieli et al., 2020; Charness et al., 2016).

both waves. Participants were fully informed about the procedures in advance.

2.3.2 Risk Preference Measures

We elicited revealed risk preferences with the convex time budget (CTB) method in wave 1 and three types of multiple price lists (MPLs) in wave 2. To infer risk preferences from participants' decisions in these methods, we rely on simple count measures because they do not require any assumptions about the model of decision-making under risk and the functional form.[10] Stated preferences were elicited in both waves with the general risk question (GRQ) and domain-specific risk questions on health (HRQ), finances (FRQ), and career (CRQ).

Next, we discuss the methods and how risk preferences are inferred from decisions. Finally, we discuss participants' understanding of the revealed preference methods based on their own subjective assessment and built-in understanding checks.

CTB. This elicitation method was introduced by Andreoni and Sprenger (2012a), designed to jointly elicit risk and time preferences. In our implementation, adapted from Potters et al. (2016), participants received two sets of 12 decision tasks sequentially (see Table 2.2).[11] In each decision task, participants were asked how they would like to divide a budget of €75 between an earlier date (t), 8 weeks from the day of participation, and a later date

[10] Another approach is to assume some model and functional form, often expected utility theory (EUT) with constant relative risk aversion (CRRA), when inferring risk preferences from MPLs (e.g., Holt and Laury, 2002; Harrison and Rutström, 2008) and CTBs (Andreoni and Sprenger, 2012a). In that case, however, findings depend on the specific model and functional form that are assumed. Drichoutis and Lusk (2016) argue, for example, that this is relevant for multiple price lists in the spirit of Holt and Laury (2002), because risk preferences measured with this method may confound the curvature of the utility function with the curvature of the probability weighting function under prospect theory. For CTB this is relevant because under EUT/CRRA it is assumed that an individual's attitude towards risk and intertemporal substitution are captured by the same parameter (Andreoni and Sprenger, 2012b; Miao and Zhong, 2015). For these reasons, we decide to avoid making assumptions about the model and functional form and use simple count measures (similar to e.g., Loomes and Pogrebna, 2014; Menkhoff and Sakha, 2017).

[11] Participants received one additional practice task at the start, which is excluded from the analysis.

(k), either 16 weeks (Set 1) or 24 weeks (Set 2) from the day of participation. Money allocated to the early date was always paid out with certainty, whereas money allocated to later dates was paid with a 100%, 90%, 70%, or 50% chance (p_{t+k}) while keeping the expected value of the payment constant. In addition, money allocated to the later date paid an interest rate ($1 + r'$) of 0%, 4%, or 16% over the delay period. To simplify the decisions, each choice set was discretized into 13 predefined allocations. Two of the predefined allocations constituted dominated choices, which serve as a comprehension and attention check.[12]

To evaluate how individuals responded to the introduction of risk, we compare allocations in decision tasks with risk to allocations in their risk-free counterpart (i.e., the task that is identical, except that it is without risk). For example, task #4 and #1 in Table 2.2 are identical, except that money allocated to the late date is uncertain in #4 and certain in #1 (and the late payment is higher in #4 to ensure that they are the same in expected value). If an individual allocates more (less) money to the later date in the task with risk, compared to its risk-free counterpart, then we categorize the allocation as risk-seeking (averse). If the individual allocates the same in both, then we categorize the allocation as risk neutral.[13] As a measure of risk preference, we simply count the number of decisions in tasks #4-#12 that are classified as risk averse (RA) with weight=-1, risk-neutral (RN) with weight=0, and risk-seeking (RS) with weight=1 for both sets (denoted as CTB1 and CTB2 hereafter). A higher score on these measures, therefore, implies a higher willingness to take risks in the task. The measures are standardized (z-score) for comparison with other risk preference measures.

MPLs. We elicit three different types of MPLs in the spirit of Holt and Laury (2002), M. Cohen et al. (1987), and Drichoutis and Lusk (2016). In our implementation, each MPL consists of ten ordered binary decisions between two lotteries, denoted as Option A and Option B (see Table 2.3 for an example). The types of MPLs differ from each other in terms of which outcomes and probabilities are used. In the first type, we present paired gambles with fixed

[12] For example, in decision #1 participants could choose between the following allocations: [70,0]; [75,0]; [67.50,7.50]; [60,15]; [52.50,22.50]; [45,30]; [37.50,37.50]; [30,45]; [22.50,52.50]; [15,60]; [7.50,67.50]; [0,75]; [0,70]. The first and the last allocations are dominated as they always yield less money than the second and second-to-last allocations, respectively.

[13] If an individual makes a corner choice in both the decision with risk and their risk-free counterpart, then we categorize the pairs of corner choices at the early (late) date as risk averse (seeking).

Table 2.2: CTB Parameters Set 1

Task	t	k	a_t	a_{t+k}	p_{t+k}	EV(a_{t+k})	1+r	1+r′
#1	8	16	€75	€75.00	1	€75.00	1.00	1.00
#2	8	16	€75	€79.50	1	€79.50	1.06	1.06
#3	8	16	€75	€93.00	1	€93.00	1.24	1.24
#4	8	16	€75	€83.40	0.9	€75.00	1.11	1.00
#5	8	16	€75	€88.35	0.9	€79.50	1.18	1.06
#6	8	16	€75	€103.35	0.9	€93.00	1.38	1.24
#7	8	16	€75	€107.10	0.7	€75.00	1.43	1.00
#8	8	16	€75	€113.55	0.7	€79.50	1.51	1.06
#9	8	16	€75	€132.75	0.7	€93.00	1.77	1.24
#10	8	16	€75	€150.00	0.5	€75.00	2.00	1.00
#11	8	16	€75	€159.00	0.5	€79.50	2.12	1.06
#12	8	16	€75	€186.00	0.5	€93.00	2.48	1.24

Notes: t=delay period early date in weeks, k=delay period late date in weeks, a_t=amount available at the early date, a_{t+k}= amount available at the late date, p_{t+k}=probability that the payment at the late date is actually paid out, EV(a_{t+k})=expected value of the amount available at the late date, 1+r=interest rate over the delay period not adjusted for risk, 1+r′= interest rate over the delay period adjusted for risk. Set 2 is identical, except that k=24.

outcomes and vary the probabilities between 0.1 and 1 when moving down the list (hereafter MPL-PGp). The last row is thus a dominated choice (i.e., one option yields a larger amount of money with certainty), which serves as a comprehension and attention check. In the second type, we present a standard gamble (i.e., Option B is a lottery with fixed probabilities of the outcomes, while Option A is a sure outcome) and increase the sure outcome when moving down the list (hereafter MPL-SGsure). In the third type, we present paired gambles with fixed probabilities and increase the highest outcome when moving down the list (hereafter MPL-PGhigh). We implement two versions of MPL-PGp that differ in the outcomes used (Tables 2.3 and 2.D.1 in Appendix 2.D), two versions of MPL-SGsure that differ in the outcomes and probabilities used (Tables 2.D.2 and 2.D.3 Appendix 2.D), and one version of MPL-PGhigh (Table 2.D.4 Appendix 2.D).[14]

The intention of the MPL design is that an individual switches at most once to the option that is becoming more attractive when moving down the list (for example option B in Table 2.3) and that this "switching point" provides

[14]Each participant received the MPLs in the same order, alternating between type of MPL. In particular, it was presented in the following order: MPL-PGp 1, MPL-SGsure 1, MPL-PGhigh 1, MPL-PGp 2, MPL-SGsure 2.

an indication of the individual's risk preference. We do not enforce a single switching point, meaning that participants are allowed to switch multiple times (see "Understanding" below). As a measure of risk preference, we simply count the number of risky choices an individual makes in decisions #1-#9 for MPL-PGp (excluding the dominated choice) and #1-#10 for MPL-SGsure and MPL-PGhigh (the measures are denoted as PGp1, PGp2, SGsure1, SGsure2, and PGhigh hereafter). A higher score on these measures, therefore, implies a higher willingness to take risks in the task. The measures are standardized (z-score) for comparison with other risk preference measures.

Table 2.3: MPL-PGp 1

	Option A					Option B				
	p	€	p	€	EV(A)	p	€	p	€	EV(B)
#1	0.1	80	0.9	64	€66	0.1	154	0.9	4	€19
#2	0.2	80	0.8	64	€67	0.2	154	0.8	4	€34
#3	0.3	80	0.7	64	€69	0.3	154	0.7	4	€49
#4	0.4	80	0.6	64	€70	0.4	154	0.6	4	€64
#5	0.5	80	0.5	64	€72	0.5	154	0.5	4	€79
#6	0.6	80	0.4	64	€74	0.6	154	0.4	4	€94
#7	0.7	80	0.3	64	€75	0.7	154	0.3	4	€109
#8	0.8	80	0.2	64	€77	0.8	154	0.2	4	€124
#9	0.9	80	0.1	64	€78	0.9	154	0.1	4	€139
#10	1	80	0	64	€80	1	154	0	4	€154

Notes: EV(A) and EV(B) list the expected value of the related lottery.

GRQ, FRQ, CRQ, HRQ. These self-reported survey questions are based on the work by Dohmen et al. (2011). Participants self-identify as being more or less willing to take risks on an eleven-point Likert-scale from "not at all willing to take risks" (0) to "very willing to take risk" (10) either in general (GRQ), or in specific domains. The specific domains include willingness to take risks in personal finances (FRQ), occupation (CRQ), and health (HRQ). We asked these questions in both waves of the study. The measures are standardized (z-score) for comparison with other risk preference measures.

Table 2.4 provides summary statistics of the risk preference measures, reported in their original unit of observation.

Table 2.4: Descriptive Statistics - Risk Preference Measures

	Unit	Mean	SD	Mdn	Min	Max	N
Revealed Methods							
CTB1	Σ RA (-1), RN (0), RS (1) Choices	-3.38	5.00	-3	-9	9	4,282
CTB2	Σ RA (-1), RN (0), RS (1) Choices	-3.66	5.17	-5	-9	9	4,282
PGp1	# Risky Choices (0-9)	3.55	1.84	4	0	9	4,282
PGp2	# Risky Choices (0-9)	4.20	2.07	4	0	9	4,282
SGsure1	# Risky Choices (0-10)	3.36	2.55	4	0	10	4,282
SGsure2	# Risky Choices (0-10)	4.07	2.53	4	0	10	4,282
PGhigh1	# Risky Choices (0-10)	3.97	2.93	4	0	10	4,282
Stated Methods							
GRQ1	Likert Item (0-10)	5.45	2.09	6	0	10	4,282
GRQ2	Likert Item (0-10)	5.77	1.87	6	0	10	4,282
FRQ1	Likert Item (0-10)	4.29	2.45	4	0	10	4,282
FRQ2	Likert Item (0-10)	4.62	2.31	5	0	10	4,282
CRQ1	Likert Item (0-10)	5.64	2.54	6	0	10	4,282
CRQ2	Likert Item (0-10)	5.78	2.32	6	0	10	4,282
HRQ1	Likert Item (0-10)	3.28	2.45	3	0	10	4,282
HRQ2	Likert Item (0-10)	3.61	2.39	3	0	10	4,282

Notes: Variables are shown here in their original unit but are standardized (z-score) for the analysis.

Understanding. To facilitate understanding of the experimental tasks, we created short videos that were shown to participants prior to the experiments (one for the CTB and one for the MPLs).[15] The videos explained the decision tasks step by step, successively highlighting the relevant parts of the decision screens. In addition to the videos, written instructions were available for online reading and download (see Appendix 2.D). Participants were required to watch the entire video or download the written instructions before being able to proceed to the decision tasks. We implemented several measures to check for understanding. First, we included multiple-choice comprehension questions prior to the experimental tasks. Second, directly after completing the tasks in an experiment, we asked the participants to self-assess whether they deemed the instructions clear on a scale from completely unclear (0) to completely clear (10). Finally, we included dominated options in the CTB and MPL-PGp tasks and did not enforce a single switching point in the MPLs.[16]

The majority of participants show a high level of understanding in all three measures. First, 89.0% (92.8%) of participants answered all three (both) comprehension questions correctly on the first try in the CTB (MPLs). Second,

[15] The videos are available at http://bit.ly/pbbs-main (in Dutch).

[16] There is some debate about the interpretation of multiple switching in MPLs (Yu et al., 2021). Evidence by Yu et al. (2021) suggests that it is mostly due to the miscomprehension of participants. Accordingly, we treat it as an indicator of participants' understanding of the experiment.

participants assessed the clarity of instructions as very clear in both the CTB (Mean=9.0, SD=1.5, Mdn=10) and MPLs (Mean=9.0, SD=1.4, Mdn=9). Finally, 88.0% of participants made zero dominated choices in the CTB and 79.8% did not switch multiple times or to the option that became less attractive and made zero dominated choices in the MPLs.[17] We conduct our analysis on the entire sample, including participants who switch multiple times, switch to the option that becomes less attractive or make dominated choices. In Section 2.5, we discuss the effect of understanding on our results.

2.3.3 Field Behavior

We consider field behavior in three domains that are expected to be associated with an individual's risk preference: financial domain (savings, investments, and debt), occupational domain (self-employment), and health domain (following COVID-19 guidelines on social distancing and handwashing). Our measures for financial and occupational field behavior are based on register data, whereas our measures for health-related behavior are self-reported.

Savings and Investments. These variables are based on the total worth of households' financial assets on January 1, 2020, measured in euros. Financial assets are categorized into savings (total amount of money in current and savings accounts) and investments (total amount of money in stocks and bonds).[18] We create three variables. First, a continuous variable capturing the total amount of savings (in log) that the household has in their current and savings accounts. We expect that a higher willingness to take risks corresponds to less (precautionary) savings, which would safeguard against short-term financial reverses. Similar measures have been used by Galizzi et al. (2016) and Charness et al. (2020). Second, a binary variable that captures whether the household has investments. Investing is riskier than keeping money in a savings account and therefore we expect a positive correlation

[17] Comparing the different types of MPLs, we observe that switching multiple times, switching to the option that became less attractive, or making a dominated choice is most prevalent in MPL-PGp (approx. 9% of participants engage in such behavior). In the other lists, this behavior is observed for 4% to 6% of participants. This number is substantially smaller than on average found in the literature (Crosetto and Filippin (2016) report 15.8% for MPL-PGp in a sample of about 7000 subjects over 54 published articles), which makes us confident that our participants have a relatively high understanding of the tasks.

[18] Unfortunately, it is not possible to distinguish between stocks and bonds with the data provided.

between willingness to take risks and investing. Similar measures have been used by Ding et al. (2010) and Dohmen et al. (2011). Third, a continuous variable measuring the ratio of investments to financial assets (i.e., the sum of savings and investments), conditional on having investments. We expect that a higher willingness to take risks corresponds to a higher investment to financial assets ratio. Similar measures have been used by Beauchamp et al. (2017), Menkhoff and Sakha (2017), and Charness et al. (2020).

Debt. This variable is based on the total worth of a household's debt, excluding mortgage debt for own house and study debt, on January 1, 2020, measured in euros.[19] We create a binary variable capturing whether or not the household has debt. Acquiring debt involves some risk because the borrower commits to a future repayment without knowing their future economic situation. Hence, we expect a positive relationship between the willingness to take risks and having debt. Similar measures have been used by Brown et al. (2013) and Menkhoff and Sakha (2017).

Self-Employment. This variable is based on the participants' occupational status on January 1, 2020. The variable is coded as (1) when the individual is self-employed and (0) when the individual is not self-employed.[20] Being self-employed generally involves more risks than receiving a regular paycheck as an employee. Therefore, we expect a positive relationship between willingness to take risks and being self-employed. Similar measures have been used by Barsky et al. (1997), Dohmen et al. (2011), Hardeweg et al. (2013), Beauchamp et al. (2017), and Charness et al. (2020).

COVID-19 Social Distancing and Handwashing. These variables are based on survey questions that asked participants to indicate whether they followed safety recommendations concerning social distancing and handwashing during the first lockdown of the COVID-19 pandemic. The questions were asked

[19] We exclude mortgage and study debt because we think these types of debt are less clearly associated with risk preferences. Mortgage debt is very common in the Netherlands (73% of the participants in our sample have a positive mortgage debt) due to the attractiveness of borrowing money for a house. Study debt can be considered an investment in the future and can also be obtained under relatively attractive conditions.

[20] Statistics Netherlands determines occupational status based on income. If an individual receives income both from employment and self-employment, the main source of income determines the occupation status.

in both waves of the survey, in both cases we take the average and standardize it. Individuals who did not respond to the question in at least one wave are excluded.[21] Given the uncertainty around COVID-19 during the first lockdown, not following safety recommendations was risky as it increased the likelihood of contracting the disease. Therefore, we expect a negative relationship between the willingness to take risks and following social distancing or handwashing safety recommendations. Similar measures on social distancing have been used by Sheth and Wright (2020), Müller and Rau (2021), Collier et al. (2022), and Bergeot and Jusot (2022). A similar measure on handwashing has been used by Collier et al. (2022).

Table 2.5: Descriptive Statistics - Field Behavior

	Unit	Mean	SD	Min	Max	N
Financial						
Savings	Log	9.99	1.71	0.00	14.49	4,276
Investments	Yes (1)/No (0)	0.30	0.46	0.00	1.00	4,276
Investments	Ratio	0.34	0.30	0.00	1.00	1,302
Debt	Yes (1)/No (0)	0.36	0.48	0.00	1.00	4,276
Occupation						
Self-employed	Yes (1)/No (0)	0.35	0.48	0.00	1.00	4,282
Health						
Distancing	Likert Item 0-5*	3.95	0.80	0.00	5.00	4,266
Handwashing	Likert Item 0-5*	3.79	0.95	0.00	5.00	4,270

Notes: Financial and occupation variables are based on register data and refer to January 1, 2020. Savings (log) is the log of the total amount of savings in current and saving accounts. Investments include stocks and bonds. Investments (y/n) captures whether the amount of investments is positive. Investments (ratio) is the ratio of investments to financial assets (i.e., the sum of savings and investments). Debt (y/n) captures whether the amount of debt, excluding mortgage and study debt, is positive. Health variables are survey questions asked in wave 1 and wave 2 of the survey, the responses are averaged. Participants who indicated that they did not want to answer either of the questions are excluded. *Variables are shown here in their original unit but are standardized (z-score) for analysis.

[21] The questions were asked on a scale from 0 "never" – 5 "always", also including the option "prefer not to answer". The exact wording for social distancing was (translated from Dutch): "In response to the so-called coronavirus (COVID-19), it is recommended to keep distance from others (so-called social distancing) when going outside. According to your own estimate, to what extent do/did you adhere to this recommendation?". The exact wording for handwashing was (translated from Dutch): "In response to the so-called coronavirus (COVID-19), it is recommended to pay more attention to hygiene, such as regularly washing your hand with water and soap. According to your own estimate, to what extent do/did you adhere to this recommendation?".

Table 2.5 summarizes the field behavior variables. We have data on each measure for nearly all participants, with a few exceptions. First, financial field behavior is unknown in the register data for six individuals. Second, the investments ratio variable contains fewer observations because it is conditional on having investments. Finally, there are a couple of missing observations for our self-reported health behavior because participants were given the option to refrain from answering these questions.

2.4 Results

We first introduce the ORIV approach by Gillen et al. (2019) that we implement to control for measurement error in our risk preference measures. Then, we analyze the correlation between the risk preference measures (convergent validity) and the correlation between each risk preference measure and the different types of field behavior (external validity). We report both raw and ORIV correlations and assess the added benefit of controlling for measurement error.

2.4.1 Empirical Strategy: ORIV

We use the ORIV approach by Gillen et al. (2019) to control for measurement error in our elicitation methods.[22] The idea behind ORIV is to use duplicates of a noisy measure to reduce attenuation bias and increase the significance of estimated coefficients. More concretely, suppose that we are interested in the relationship between a dependent variable, denoted by y, and an explanatory variable, denoted by x. We do not directly observe x, but we have two duplicates of a noisy measure, say x_1 and x_2, that are both proxies for x. Under the assumption that the errors in both measures are independent, we can control for measurement error in the explanatory variable by simultaneously using x_1 as an instrument for x_2 and x_2 as an instrument for x_1. In this case, we apply ORIV one-sided because only the explanatory variable, but not the dependent variable, is measured with error. The resulting model can be estimated by means of a stacked two-stage least squares (2SLS) regression with clustered standard errors and can be written as follows[23]:

[22] Perez et al. (2021) show in simulations that ORIV requires a sufficient sample size to solve the significance issue resulting from measurement error. They report that $N = 1000$ is sufficient to overcome the significance bias almost every time, a criterion easily met with our sample.

[23] The technique uses each individual twice (stacked dataset), thus clustered standard errors should be used to appropriately treat multiple observations as having the same source.

$$\begin{pmatrix} y \\ y \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \end{pmatrix} + \beta \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} + \epsilon \tag{2.1}$$

$$\text{instrumenting } \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} \text{ with } W = \begin{pmatrix} x_2 & 0_N \\ 0_N & x_1 \end{pmatrix}$$

Where N is the sample size and 0_N is a $N \times 1$ zero matrix. Gillen et al. (2019) show that this technique produces consistent coefficients and results in efficient use of the data. The model can easily be extended to the case where both the dependent and explanatory variables are measured with error, thus two-sided. We use this, for example, to assess the correlation between different risk preference measures. In that case, the model can be written as follows, where y_1 and y_2 are two duplicates of a noisy dependent variable:

$$\begin{pmatrix} y_1 \\ y_1 \\ y_2 \\ y_2 \end{pmatrix} = \begin{pmatrix} \alpha_1 \\ \alpha_2 \\ \alpha_1 \\ \alpha_2 \end{pmatrix} + \beta \begin{pmatrix} x_1 \\ x_2 \\ x_1 \\ x_2 \end{pmatrix} + \epsilon \tag{2.2}$$

$$\text{instrumenting } \begin{pmatrix} x_1 \\ x_2 \\ x_1 \\ x_2 \end{pmatrix} \text{ with } W = \begin{pmatrix} x_2 & 0_N & 0_N & 0_N \\ 0_N & x_1 & 0_N & 0_N \\ 0_N & 0_N & x_2 & 0_N \\ 0_N & 0_N & 0_N & x_1 \end{pmatrix}.$$

2.4.2 Convergent Validity

Table 2.6 reports the correlations between the risk preference measures and contrasts raw and ORIV correlations with each other. Looking at the raw correlations (printed in normal font), our results are mostly in line with previous literature (e.g., Galizzi et al., 2016; Menkhoff and Sakha, 2017). We find raw correlations of $.20 - .45$ between revealed preference methods (1)-(4) and higher correlations between stated preference methods (5)-(8) of $.35 - .62$. Correlations between revealed and stated methods are weakest, ranging from .07 to .26.

When we control for measurement error using ORIV (printed in bold font), correlations between measures increase. First, we observe a substantial increase in correlation coefficients between the different types of MPLs (raw:

Table 2.6: **ORIV**/Raw Correlation - Risk Preference Measures

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) CTB	1							
(2) PGp	**0.34**/0.20	1						
(3) SGsure	**0.39**/0.22	**0.60**/0.29	1					
(4) PGhigh	**0.30**/0.20	**0.88**/0.45	**0.67**/0.31	1				
(5) GRQ	**0.38**/0.26	**0.39**/0.23	**0.39**/0.22	**0.30**/0.20	1			
(6) FRQ	**0.31**/0.21	**0.30**/0.18	**0.37**/0.21	**0.24**/0.16	**0.94**/0.62	1		
(7) CRQ	**0.19**/0.12	**0.20**/0.11	**0.23**/0.12	**0.16**/0.10	**0.77**/0.49	**0.71**/0.45	1	
(8) HRQ	**0.18**/0.12	**0.15**/0.09	**0.21**/0.12	**0.11**/0.07	**0.53**/0.35	**0.70**/0.46	**0.56**/0.35	1

Notes: We apply ORIV one-sided (Equation 2.1) for PGhigh because we do not have a duplicate for this elicitation method and two-sided (Equation 2.2) for all other measures. All correlations are statistically significant ($p < 0.01$).

$.29 - .45$, ORIV: $.60 - .88$). Second, the correlation between the CTB and MPLs increases as well but only modestly (raw: $.20 - .22$, ORIV: $.30 - .39$). Third, we observe a substantial increase in correlations between stated preference methods (raw: $.35 - .62$, ORIV: $.53 - .94$). Finally, correlations between revealed and stated methods increase modestly (raw: $.07 - .26$, ORIV: $.11 - .39$).

Our results corroborate the findings from Gillen et al. (2019) in a general population sample, observing that correlations between risk preference measures increase when controlling for measurement error. Importantly, controlling for measurement is particularly relevant for comparing different types of MPLs, as the correlations increase substantially. This suggests that there may be more similarity between different types of MPLs than suggested in previous work (for instance, Csermely and Rabas, 2016; Drichoutis and Lusk, 2016). At the same time, correlations between CTB, MPLs, and GRQ remain moderate at best, indicating that measurement error alone can only partly explain differences between measures. We now turn to our analysis of the relationship between risk preference measures and risk-related field behavior.

2.4.3 External Validity

We first discuss the relationship between risk preference measures and field behavior when controlling for measurement error. To this end, we run stacked 2SLS regressions following the ORIV approach (equation 2.1), or simple OLS regressions in the case of PGhigh (because we do not have a duplicate for this measure), separately for each pair of field behavior and risk preference measure. In all models, we control for individual characteristics of the decision-maker (including variables for sex, age,

migration background, marital status, parenthood, and whether or not the participant is the breadwinner) as well as household characteristics (income and wealth).

Table 2.7 reports our estimates concerning external validity (full regressions are reported in Appendix 2.A). Specifically, the table lists the coefficients and significance levels of each risk preference measure when included as an explanatory variable in separate regression models with the respective type of field behavior as the dependent variable. Overall, the results reveal a clear difference between revealed and stated risk preference measures. Stated measures are statistically significantly associated with field behavior in most cases, whereas revealed measures are associated only with specific types of field behavior. We discuss the results in more detail separately for the financial, occupational, and health domains.

Table 2.7: Regressions - Risk Preference Measures and Field Behavior

	Financial				**Occupation**	**Health**	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
CTB	0.02	0.01	0.00	-0.01	0.02*	-0.07**	-0.03
	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
PGp	-0.04	0.02	0.01	0.01	0.02	-0.12**	-0.05
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
SGsure	0.02	0.02	0.06*	-0.01	0.02	-0.14**	-0.12**
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
PGhigh	-0.03	0.01	0.01	0.01	0.01	-0.06**	0.00
	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
GRQ	-0.22***	0.05***	0.06***	0.06***	0.08***	-0.11***	-0.04
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
FRQ	-0.12***	0.11***	0.07***	0.04***	0.09***	-0.16***	-0.11***
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
CRQ	-0.20***	0.02	0.04**	0.06***	0.12***	-0.07**	-0.05*
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
HRQ	-0.13***	0.01	0.02*	0.03**	0.06***	-0.29***	-0.26***
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
N	4,276	4,276	1,302	4,276	4,282	4,266	4,270
Controls	✓	✓	✓	✓	✓	✓	✓

Notes: Each coefficient is from a separate regression, full regressions are reported in Appendix 2.A. Coefficients are from stacked 2SLS regressions with duplicate measures as IVs, following the ORIV approach (Equation 2.1) with clustered standard errors in parenthesis, or OLS in the case of PGhigh (because we do not have a duplicate for this measure) with robust standard errors in parenthesis. N represents the number of participants; the number of observations is doubled for the 2SLS regression because the data is stacked. Regressions control for sex, age, migration background, marital status, child (y/n), breadwinner (y/n), income (quintiles), and wealth other (quintiles). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

In the financial domain, we find almost no statistically significant relationships between the incentivized measures and field behavior. The only exception is SGsure, which is positively correlated with the investment ratio. On the contrary, most of the survey measures are statistically significantly correlated with financial behavior, and in the expected direction, with a higher reported willingness to take risks being associated with more risky behavior in the field. Importantly, the relationships between the survey measures and field behavior are also economically significant. For example, a one-standard-deviation increase in the willingness to take risks in financial matters is associated with an 11 percentage point increase in the probability of having investments, corresponding to a 37% increase relative to the unconditional probability.[24] Similarly, a one-standard-deviation increase in the general willingness to take risks is associated with a decrease of about 20% in savings. The relationships between the survey measures and the investment ratio and debt are smaller but remain sizeable.

In the occupational domain, we find a statistically significant association between the CTB and being self-employed. Specifically, a one-standard-deviation increase in the willingness to take risks in the task is associated with a two percentage point increase in being self-employed, corresponding roughly to a 6% increase relative to the unconditional probability. Similar effect sizes are found for the different types of MPLs (PGp, SGsure, and PGhigh), but they are not statistically significant. The survey measures are all statistically significantly related to self-employment. As expected, the willingness to take risks in career matters (CRQ) has the largest coefficient. Specifically, a one-standard-deviation increase in the willingness to take risks in career matters is associated with a 12 percentage point increase in being self-employed, corresponding to a 34% increase relative to the unconditional probability.[25]

In the health domain, the incentivized measures perform better as compared to the other domains: all incentivized measures are statistically significantly associated with the frequency of following social distancing recommendations and SGsure is statistically significantly associated with the reported frequency of handwashing. The effect sizes are relatively small, however. The

[24] This result is similar to Dohmen et al. (2011) who find that a one-standard-deviation increase in the willingness to take risk in financial matters is associated with a 34% increase in investing in stocks in a large representative sample of Germans.

[25] Dohmen et al. (2011) report a similar result in Germany, finding that a one-standard-deviation increase in the willingness to take risks in career matters is associated with a 43% increase in being self-employed.

effect size of SGsure, which has the largest coefficient among the incentivized measures, implies that a one-standard-deviation increase in the willingness to take risk is associated with a 0.14 standard-deviation decrease in the self-reported following of social distancing recommendations. The survey measures are almost all statistically significantly related to following social distancing and handwashing recommendations. As expected, the willingness to take risks in the health domain has the largest coefficient. Specifically, a one-standard-deviation increase in the willingness to take risks in health matters (HRQ) is associated with a 0.29 standard-deviation decrease in the self-reported following of social distancing recommendations. The economic significance of the other survey questions is smaller and similar to the incentivized measures.

A relevant question that arises is what effect controlling for measurement error has on these analyses. Thus, how do the estimates from specifications with ORIV compare to those without ORIV? To address this question, we consider two alternatives. First, we analyze the case where there are no duplicates available of an elicitation method. Specifically, we run simple OLS regressions with only one version of a risk preference elicitation method as the main explanatory variable (hereafter "ONE").[26] Second, we analyze the case where we calculate a simple average of the duplicate measures and run OLS regression with this (uncorrected) average as the main explanatory variable (hereafter "AVG"). We contrast the estimated effects with those where we control for measurement error (ORIV).

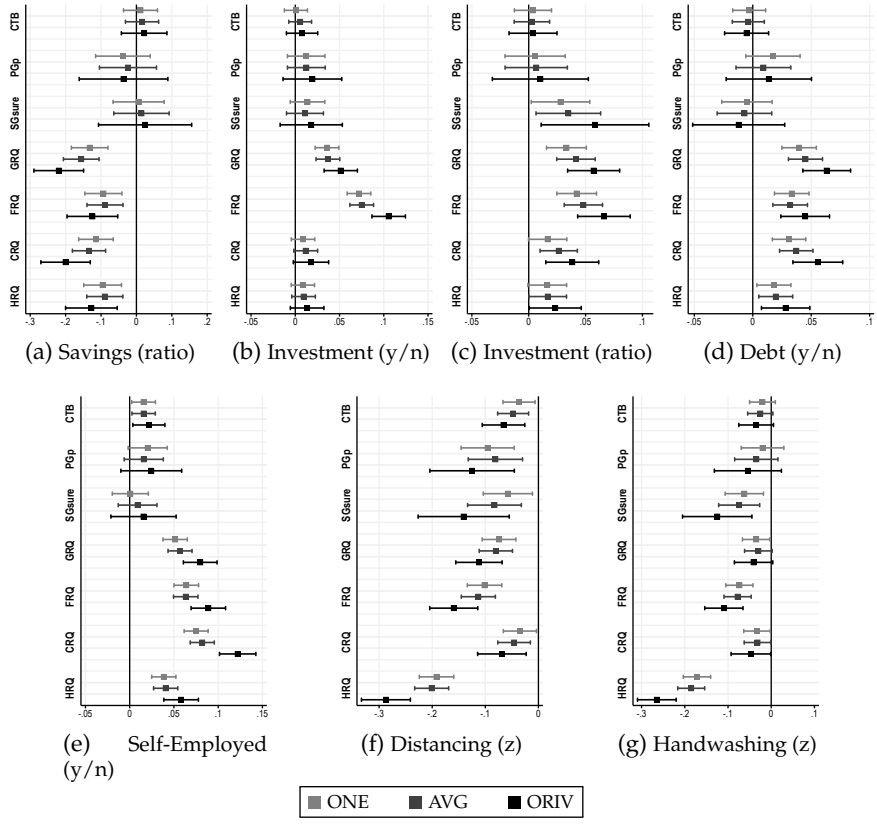
Figure 2.1 shows the results of this analysis. Each panel corresponds to one measure of field behavior and displays the point estimates and corresponding 95%-confidence intervals of the main explanatory variable (i.e., the risk preference measure) from the three different specifications (ONE, AVG, ORIV).[27] The solid vertical line represents a coefficient of zero. For example, panel (a) shows the estimated effect sizes of the relationship between the risk preference measures and savings (log). For each risk preference measure, the estimates from top to bottom represent the ONE (light grey), AVG (dark grey), and ORIV (black) specifications, respectively. In panel (a), we thus observe that none of the revealed preference measures have a statistically significant association with savings (log) for any of the specifications. In contrast, all

[26] We consider the first task that the participant sees within a given method (CTB1, PGp1, SGsure1) for incentivized measures and the response from wave 1 (GRQ1, FRQ1, CRQ1, HRQ1) for survey questions.

[27] Note that the 95% confidence intervals increase after applying ORIV, which is a consequence of clustering standard errors when using stacked 2SLS regression.

stated preference measures have a statistically significant association with log (savings) for all specifications. Comparing the different specifications within each method, we can observe that estimates are larger when using ORIV, but the effect is most pronounced for those cases where the estimated effect is already statistically significant in the ONE and AVG specifications.

Looking at all panels in Figure 2.1, we can observe that it is generally the case that the estimated effect sizes tend to increase only when the estimated effect is already statistically significant in the ONE and AVG specifications



(a) Savings (ratio) (b) Investment (y/n) (c) Investment (ratio) (d) Debt (y/n)

(e) Self-Employed (y/n) (f) Distancing (z) (g) Handwashing (z)

Figure 2.1: The effect of controlling for measurement error with ORIV on regression coefficients

and that this is the case for both the stated and the revealed preference measures. Therefore, controlling for measurement error in our sample using ORIV seems to allow for estimating larger effect sizes in case of statistically significant relations, but does not lead to changes in the conclusions of statistical significance per se in a particular domain of field behavior.

2.5 Robustness Check: Understanding

Our results show that survey measures perform better in terms of their relation to field behavior than incentivized measures, irrespective of whether or not measurement error is controlled for. A possible reason why incentivized measures may perform worse than survey measures is that they are more complex. It might thus be that the incentivized measures have a higher predictive power for participants who are able to better cope with this complexity. To test this conjecture, we rerun our analyses, restricting the sample to participants who arguably have a high understanding of the experimental tasks. We categorize individuals as having "high understanding" if they did not make any dominated choices in the CTB or MPLs, did not switch multiple times or to the option that became less attractive in the MPLs, did not make mistakes in the comprehension questions in the CTB or MPLs, and rated their understanding of the experimental instructions for the CTB and MPL tasks with a score of 10 out of 10. This leaves 1,114 individuals (26% of the full sample) for the analysis.

Table 2.8 reproduces the external validity results for the subset of individuals who we categorize as having a high understanding (full regressions are reported in Appendix 2.B). Despite reducing the sample size to a quarter, we observe more statistically significant associations between revealed preference methods and financial field behavior. Specifically, we now find an association between the CTB, PGp, and SGsure measures and the probability of having investments. This suggests that the external validity of incentivized measures somewhat improves when considering only individuals who appear to have a high understanding. At the same time, there is little improvement for the other measures of field behavior that we consider.[28] Thus, overall, and particularly compared to stated preference methods, the external validity of the

[28] In fact, for both revealed and stated preference methods we find less statistically significant associations than in the regressions for the full sample. However, this appears to be a consequence of reducing the sample size in most cases, given that effect sizes largely remain of similar magnitude.

Table 2.8: Regressions - Risk Preference Measures and Field Behavior for High Understanding

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
CTB	0.08	0.05**	0.01	0.01	0.04*	-0.09**	-0.08
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
PGp	-0.02	0.10**	0.05	0.02	0.06	-0.18*	-0.07
	(0.13)	(0.04)	(0.04)	(0.04)	(0.04)	(0.08)	(0.09)
SGsure	0.21	0.07*	0.05	0.08	0.05	-0.12	-0.15
	(0.13)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.09)
PGhigh	0.01	0.02	0.03	-0.01	0.03	-0.10*	-0.02
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
GRQ	-0.09	0.07***	0.05*	0.06***	0.12***	-0.10*	-0.08
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
FRQ	0.03	0.13***	0.04	0.06**	0.12***	-0.12**	-0.17***
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
CRQ	-0.08	0.04*	0.03	0.05*	0.14***	-0.04	-0.09*
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
HRQ	-0.05	0.01	0.03	0.04	0.07***	-0.27***	-0.28***
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)
N	1,114	1,114	354	1,114	1,114	1,111	1,111
Controls	✓	✓	✓	✓	✓	✓	✓

Notes: Each coefficient is from a separate regression, full regression are reported in Appendix 2.B. Coefficients are from stacked 2SLS regressions with duplicate measures as IVs, following the ORIV approach (Equation 2.1) with clustered standard errors in parenthesis, or OLS in the case of PGhigh with robust standard errors in parenthesis. N represents the number of participants; the number of observations is doubled for the 2SLS regression because the data is stacked. Regressions control for sex, age, migration background, marital status, child (y/n), household size, and breadwinner (y/n). *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$

incentivized methods remains low even for the group of participants who appear to have a high understanding.

2.6 Discussion and Conclusion

We have investigated the convergent and external validity of commonly used survey and incentivized methods for risk preferences in a large and heterogeneous population sample from the Netherlands. We find that controlling for measurement error using ORIV improves the correlation within and to a lesser extent between risk preference measures in our sample. This corroborates the recommendation by Gillen et al. (2019) that measurement error should be taken into account when using risk preference elicitation meth-

ods and suggests that not accounting for measurement error can partly explain the lack of convergent validity among risk preference elicitation methods found in previous studies. At the same time, we find that the external validity of survey measures in our sample is higher relative to incentivized measures, even after controlling for measurement error. Thus, measurement error appears insufficient to explain why the external validity of incentivized risk preference elicitation methods is generally found to be low.

It remains an open question why we find that the external validity of incentivized methods is so low. A potential explanation is that the incentivized methods that we used are relatively complex for participants to understand (e.g., Charness et al., 2013). However, this conjecture is at odds with our observation that participants exhibit relatively high levels of understanding both in their behavior (i.e., the low prevalence of dominated choices and multiple switching) as well as their own subjective assessment. Moreover, in a robustness check where we re-run our analysis concerning external validity on a quarter of the participants that we classified (under some strict criteria) as individuals with high understanding, we find that our conclusions are largely unaltered.

An alternative explanation is that the stakes that we used for the incentivized methods are too small. Consequently, it might be that people's propensity to take risks in these tasks is related to different factors than the large-stake and more long-term oriented financial and occupational choices. This could also potentially explain why the correlation between incentivized methods and lower-impact health-related behavior such as social distancing and handwashing tends to be higher. At the same time, however, there is evidence suggesting that behavior in risk elicitation tasks is not affected by low to moderate incentives compared to no incentives (Hackethal et al., 2023). Moreover, in a different setting, it was found that (very) high stakes in experiments do not necessarily improve the decision quality in participants' decisions (Enke et al., 2023). More research is needed that investigates the external validity of incentivized methods that use (very) high stakes.

We also acknowledge that the choice of the incentive structure (i.e., paying only 1 out of 5 participants) could have caused a selection effect in our sample. In particular, it may have been the case that more risk-averse individuals were less likely to accept this "gamble" and therefore influence the distribution of risk preferences in our sample. However, even if such selection effects play a role, this should not affect the general conclusions about convergent

and external validity: the average level of risk tolerance should not affect the correlations between preference measures and field behavior.

Finally, it is important to note that the variety of incentivized risk preference methods that exist is large, and although we include multiple methods, the results of our study do not necessarily extend to other risk preference methods that we did not include. The scope of our study also does not allow us to systematically explore which specific factors of incentivized methods may improve or deteriorate the external validity of specific methods. More systematic research is needed into other existing methods and determining which designs can capture risk preferences that exhibit higher correlations with risk-related field behavior.

To conclude, accurately measuring risk preferences is an important topic for researchers, policymakers, and professionals, and hence it is important that we can ensure the validity of the methods that we use. Despite the intuitive appeal of incentivized risk preference methods, the methods generally perform poorly when they are evaluated on their convergent and external validity (e.g., Friedman et al., 2014; Mata et al., 2018). As shown in this chapter, accounting for measurement error partly addresses the issue for the incentivized methods that we study: it improves their convergent validity, but it does not improve their external validity. In contrast, stated preference methods appear to perform much better on convergent and external validity (Mata et al., 2018), something that we confirm in this chapter as well. An important drawback of stated preference methods, however, is that they do not allow for quantitative parameter estimates and are generally harder to interpret. Moving forward, it is important to further investigate why incentivized risk preference elicitation methods generally perform poorly concerning external validity and use these insights to improve the validity of the methods.

Appendices

2.A Full Regressions Entire Sample

Table 2.A.1: Full Regressions - CTB and Field Behavior

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
CTB	0.02	0.01	0.00	-0.01	0.02*	-0.07**	-0.03
	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Female	0.09	-0.01	-0.02	-0.06***	-0.07***	0.21***	0.39***
	(0.05)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Age	0.01***	0.00***	0.00***	-0.00	0.00***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.22***	-0.03	0.02	-0.05**	-0.08***	-0.05	-0.09**
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Migration Background (1=native)	0.29***	0.01	-0.01	-0.09***	-0.01	-0.10*	-0.27***
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.04)
Marital Status (1=married)	0.10	-0.02	-0.03	-0.04*	-0.03	0.06	0.05
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Children (1=yes)	-0.07	-0.01	-0.02	0.13***	0.02	-0.07	-0.06
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Household Wealth Other (Quintile=2)	0.50***	0.03	0.01	-0.05*	-0.07**	-0.01	-0.03
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=3)	0.78***	0.06**	0.07*	-0.05	0.03	0.08	-0.03
	(0.09)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=4)	1.12***	0.19***	0.06*	-0.06*	0.11***	0.02	-0.12*
	(0.09)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Household Wealth Other (Quintile=5)	1.23***	0.25***	0.13***	0.11***	0.37***	-0.02	-0.10
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Household Income (Quintile=2)	0.32***	0.01	-0.00	-0.07**	-0.05*	0.01	0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=3)	0.65***	0.05*	-0.04	-0.05*	-0.09***	-0.00	-0.02
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=4)	0.77***	0.07***	-0.03	-0.09***	-0.11***	0.03	-0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=5)	0.95***	0.17***	-0.01	-0.05	-0.04	0.01	-0.03
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Constant Stack 1	8.01***	0.02	0.14**	0.53***	0.24***	-0.78***	-0.32***
	(0.15)	(0.03)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Constant Stack 2	8.01***	0.02	0.14**	0.53***	0.24***	-0.78***	-0.32***
	(0.15)	(0.03)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Observations	8552	8552	2604	8552	8552	8520	8528

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.A.2: Full Regressions - PGp and Field Behavior

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
PGp	-0.04	0.02	0.01	0.01	0.02	-0.12**	-0.05
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Female	0.09	-0.01	-0.02	-0.06***	-0.07***	0.21***	0.39***
	(0.05)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Age	0.01***	0.00***	0.00***	-0.00	0.00***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.22***	-0.03	0.02	-0.05**	-0.08***	-0.05	-0.09**
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Migration Background (1=native)	0.30***	0.01	-0.01	-0.09***	-0.01	-0.10*	-0.27***
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.04)
Marital Status (1=married)	0.10	-0.02	-0.03	-0.04*	-0.03	0.06	0.05
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Children (1=yes)	-0.07	-0.01	-0.02	0.13***	0.02	-0.07	-0.06
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Household Wealth Other (Quintile=2)	0.50***	0.03	0.01	-0.05*	-0.07**	-0.01	-0.03
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=3)	0.79***	0.06**	0.07*	-0.05	0.03	0.07	-0.03
	(0.09)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=4)	1.12***	0.19***	0.06*	-0.07*	0.12***	0.02	-0.12*
	(0.09)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Household Wealth Other (Quintile=5)	1.24***	0.25***	0.13***	0.11***	0.37***	-0.02	-0.10
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Household Income (Quintile=2)	0.32***	0.01	-0.00	-0.07**	-0.05*	0.01	0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=3)	0.65***	0.05*	-0.04	-0.05*	-0.09***	-0.01	-0.02
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=4)	0.77***	0.07**	-0.03	-0.09***	-0.11***	0.03	-0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=5)	0.95***	0.17***	-0.01	-0.05	-0.04	0.01	-0.03
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Constant Stack 1	7.98***	0.03	0.15**	0.54***	0.26***	-0.85***	-0.35***
	(0.15)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.09)
Constant Stack 2	7.98***	0.03	0.15**	0.54***	0.25***	-0.85***	-0.35***
	(0.15)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.09)
Observations	8552	8552	2604	8552	8552	8520	8528

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.A.3: Full Regressions - SGsure and Field Behavior

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
SGsure	0.02	0.02	0.06*	-0.01	0.02	-0.14**	-0.12**
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Female	0.09	-0.01	-0.01	-0.06***	-0.07***	0.20***	0.38***
	(0.05)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Age	0.01***	0.00***	0.00***	-0.00	0.00***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.22***	-0.03	0.02	-0.05**	-0.08***	-0.05	-0.08*
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Migration Background (1=native)	0.29***	0.01	-0.01	-0.09***	-0.01	-0.10*	-0.27***
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.04)
Marital Status (1=married)	0.10	-0.02	-0.03	-0.04*	-0.03	0.06	0.05
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Children (1=yes)	-0.07	-0.01	-0.02	0.13***	0.02	-0.07	-0.06
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Household Wealth Other (Quintile=2)	0.50***	0.04	0.02	-0.06*	-0.07**	-0.03	-0.04
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=3)	0.79***	0.06**	0.07*	-0.05	0.03	0.07	-0.03
	(0.09)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=4)	1.12***	0.19***	0.06*	-0.06*	0.12***	0.02	-0.12*
	(0.09)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Household Wealth Other (Quintile=5)	1.23***	0.25***	0.13***	0.11***	0.37***	-0.01	-0.09
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Household Income (Quintile=2)	0.32***	0.01	-0.00	-0.07**	-0.05*	0.01	0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=3)	0.65***	0.05*	-0.05	-0.05*	-0.09***	0.00	-0.01
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=4)	0.77***	0.07**	-0.03	-0.09***	-0.11***	0.04	0.00
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=5)	0.95***	0.17***	-0.02	-0.05	-0.04	0.02	-0.02
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Constant Stack 1	8.01***	0.03	0.16**	0.52***	0.24***	-0.82***	-0.36***
	(0.15)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.09)
Constant Stack 2	8.01***	0.03	0.16**	0.52***	0.24***	-0.82***	-0.36***
	(0.15)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.09)
Observations	8552	8552	2604	8552	8552	8520	8528

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.A.4: Full Regressions - PGhigh and Field Behavior

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
PGhigh	-0.03	0.01	0.01	0.01	0.01	-0.06**	0.00
	(0.03)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Female	0.09	-0.01	-0.02	-0.06***	-0.07***	0.21***	0.40***
	(0.05)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Age	0.01***	0.00***	0.00***	-0.00	0.00***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.22***	-0.03	0.02	-0.05**	-0.08***	-0.05	-0.09**
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Migration Background (1=native)	0.30***	0.01	-0.01	-0.09***	-0.01	-0.10*	-0.27***
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.04)
Marital Status (1=married)	0.10	-0.02	-0.03	-0.04*	-0.03	0.06	0.05
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Children (1=yes)	-0.07	-0.01	-0.02	0.13***	0.02	-0.07	-0.06
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Household Wealth Other (Quintile=2)	0.50***	0.03	0.01	-0.06*	-0.07**	-0.01	-0.03
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=3)	0.79***	0.06**	0.07*	-0.05	0.03	0.07	-0.03
	(0.09)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=4)	1.12***	0.19***	0.06*	-0.07*	0.12***	0.02	-0.12*
	(0.09)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Household Wealth Other (Quintile=5)	1.23***	0.26***	0.13***	0.11***	0.37***	-0.02	-0.10
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Household Income (Quintile=2)	0.32***	0.01	-0.00	-0.07**	-0.05*	0.01	0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=3)	0.65***	0.05*	-0.04	-0.05*	-0.09***	-0.00	-0.02
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=4)	0.77***	0.07***	-0.03	-0.09***	-0.11***	0.03	-0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=5)	0.95***	0.17***	-0.01	-0.05	-0.04	0.00	-0.04
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Constant	7.98***	0.03	0.15**	0.53***	0.25***	-0.80***	-0.32***
	(0.15)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.09)
Observations	4276	4276	1302	4276	4276	4260	4264

Notes: Coefficients are from OLS regressions with robust standard errors in parenthesis. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.A.5: Full Regressions - GRQ and Field Behavior

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
GRQ	-0.22***	0.05***	0.06***	0.06***	0.08***	-0.11***	-0.04
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Female	0.02	0.01	0.00	-0.04*	-0.05**	0.18***	0.39***
	(0.05)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Age	0.01***	0.00***	0.00***	-0.00	0.00***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.21***	-0.03	0.02	-0.05**	-0.08***	-0.05	-0.09**
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Migration Background (1=native)	0.30***	0.01	-0.02	-0.10***	-0.02	-0.10*	-0.27***
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.04)
Marital Status (1=married)	0.06	-0.01	-0.02	-0.03	-0.01	0.04	0.04
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Children (1=yes)	-0.04	-0.01	-0.03	0.12***	0.01	-0.06	-0.05
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Household Wealth Other (Quintile=2)	0.46***	0.04*	0.02	-0.04	-0.06**	-0.03	-0.04
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=3)	0.77***	0.07**	0.07*	-0.04	0.04	0.06	-0.03
	(0.09)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=4)	1.12***	0.19***	0.07*	-0.06*	0.12***	0.01	-0.12*
	(0.09)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Household Wealth Other (Quintile=5)	1.27***	0.25***	0.12***	0.10***	0.36***	-0.00	-0.09
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Household Income (Quintile=2)	0.32***	0.01	-0.00	-0.07**	-0.05*	0.01	0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=3)	0.65***	0.05*	-0.05	-0.05*	-0.09***	-0.00	-0.02
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=4)	0.79***	0.07**	-0.03	-0.10***	-0.12***	0.04	-0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=5)	0.98***	0.16***	-0.02	-0.06*	-0.05	0.01	-0.03
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Constant Stack 1	8.07***	0.01	0.13**	0.51***	0.21***	-0.73***	-0.30***
	(0.15)	(0.03)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Constant Stack 2	8.08***	0.01	0.13**	0.51***	0.21***	-0.73***	-0.30***
	(0.15)	(0.03)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Observations	8552	8552	2604	8552	8552	8520	8528

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.A.6: Full Regressions - FRQ and Field Behavior

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
FRQ	-0.12***	0.11***	0.07***	0.04***	0.09***	-0.16***	-0.11***
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Female	0.05	0.03	0.01	-0.04**	-0.04**	0.16***	0.36***
	(0.05)	(0.01)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Age	0.01***	0.00***	0.00***	-0.00	0.00***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.21***	-0.03*	0.01	-0.05**	-0.08***	-0.04	-0.08*
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Migration Background (1=native)	0.30***	0.01	-0.02	-0.09***	-0.01	-0.10*	-0.27***
	(0.08)	(0.02)	(0.02)	(0.02)	(0.02)	(0.05)	(0.04)
Marital Status (1=married)	0.08	-0.00	-0.02	-0.03	-0.01	0.03	0.03
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Children (1=yes)	-0.06	-0.02	-0.02	0.12***	0.01	-0.06	-0.05
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Household Wealth Other (Quintile=2)	0.48***	0.05*	0.02	-0.05*	-0.06**	-0.03	-0.04
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=3)	0.79***	0.06**	0.07*	-0.05	0.03	0.07	-0.03
	(0.09)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=4)	1.13***	0.18***	0.06*	-0.07**	0.11***	0.02	-0.12*
	(0.09)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Household Wealth Other (Quintile=5)	1.27***	0.23***	0.12***	0.10***	0.35***	0.02	-0.07
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Household Income (Quintile=2)	0.32***	0.00	-0.00	-0.07**	-0.06**	0.02	0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=3)	0.65***	0.04*	-0.05	-0.06*	-0.10***	0.00	-0.02
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=4)	0.79***	0.06**	-0.03	-0.10***	-0.12***	0.05	0.00
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=5)	0.97***	0.15***	-0.02	-0.06*	-0.05*	0.02	-0.02
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Constant Stack 1	8.05***	-0.01	0.12*	0.51***	0.21***	-0.71***	-0.28***
	(0.15)	(0.03)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Constant Stack 2	8.05***	-0.02	0.12*	0.51***	0.21***	-0.71***	-0.28***
	(0.15)	(0.03)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Observations	8552	8552	2604	8552	8552	8520	8528

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.A.7: Full Regressions - CRQ and Field Behavior

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
CRQ	-0.20***	0.02	0.04**	0.06***	0.12***	-0.07**	-0.05*
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Female	0.06	-0.01	-0.02	-0.05**	-0.05***	0.21***	0.39***
	(0.05)	(0.01)	(0.02)	(0.02)	(0.01)	(0.03)	(0.03)
Age	0.01***	0.00***	0.00***	-0.00	0.00***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.23***	-0.02	0.03	-0.05**	-0.07***	-0.06	-0.09**
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Migration Background (1=native)	0.30***	0.01	-0.01	-0.09***	-0.01	-0.10*	-0.27***
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.04)
Marital Status (1=married)	0.08	-0.02	-0.02	-0.03	-0.01	0.05	0.05
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Children (1=yes)	-0.07	-0.01	-0.02	0.13***	0.02	-0.07	-0.06
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Household Wealth Other (Quintile=2)	0.46***	0.04	0.02	-0.04	-0.05*	-0.03	-0.04
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=3)	0.76***	0.07**	0.07*	-0.04	0.04	0.06	-0.04
	(0.09)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=4)	1.12***	0.19***	0.06*	-0.06*	0.12***	0.01	-0.12*
	(0.09)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Household Wealth Other (Quintile=5)	1.26***	0.25***	0.13***	0.10***	0.36***	-0.01	-0.09
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Household Income (Quintile=2)	0.30***	0.01	-0.00	-0.07**	-0.04	0.00	0.00
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=3)	0.63***	0.05*	-0.05	-0.05*	-0.08***	-0.01	-0.03
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=4)	0.76***	0.08***	-0.03	-0.09***	-0.10***	0.02	-0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=5)	0.95***	0.17***	-0.01	-0.05	-0.03	-0.00	-0.04
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Constant Stack 1	8.09***	0.01	0.14**	0.50***	0.19***	-0.74***	-0.30***
	(0.15)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Constant Stack 2	8.10***	0.01	0.14**	0.50***	0.18***	-0.74***	-0.30***
	(0.15)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Observations	8552	8552	2604	8552	8552	8520	8528

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.A.8: Full Regressions - HRQ and Field Behavior

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
HRQ	-0.13***	0.01	0.02*	0.03**	0.06***	-0.29***	-0.26***
	(0.04)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)
Female	0.07	-0.01	-0.02	-0.05***	-0.06***	0.18***	0.36***
	(0.05)	(0.01)	(0.02)	(0.02)	(0.01)	(0.03)	(0.03)
Age	0.01***	0.00***	0.00***	-0.00	0.00***	0.01***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.22***	-0.03	0.02	-0.05**	-0.08***	-0.04	-0.08*
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.03)	(0.03)
Migration Background (1=native)	0.31***	0.01	-0.02	-0.10***	-0.02	-0.06	-0.23***
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.04)
Marital Status (1=married)	0.08	-0.02	-0.03	-0.04*	-0.02	0.02	0.01
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Children (1=yes)	-0.07	-0.01	-0.02	0.13***	0.02	-0.06	-0.05
	(0.07)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Household Wealth Other (Quintile=2)	0.48***	0.04	0.02	-0.05*	-0.06**	-0.06	-0.08
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=3)	0.77***	0.07**	0.07*	-0.04	0.04	0.04	-0.06
	(0.09)	(0.02)	(0.03)	(0.03)	(0.02)	(0.05)	(0.05)
Household Wealth Other (Quintile=4)	1.12***	0.19***	0.06*	-0.06*	0.12***	0.00	-0.13*
	(0.09)	(0.02)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Household Wealth Other (Quintile=5)	1.23***	0.26***	0.13***	0.11***	0.37***	-0.02	-0.10
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.06)
Household Income (Quintile=2)	0.32***	0.01	-0.00	-0.07**	-0.06*	0.02	0.02
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=3)	0.65***	0.05*	-0.05	-0.05*	-0.09***	0.00	-0.02
	(0.08)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=4)	0.77***	0.07***	-0.03	-0.09***	-0.11***	0.03	-0.01
	(0.09)	(0.02)	(0.03)	(0.02)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=5)	0.96***	0.17***	-0.01	-0.05	-0.04	0.01	-0.03
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.05)
Constant Stack 1	8.07***	0.02	0.14**	0.51***	0.21***	-0.62***	-0.18*
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Constant Stack 2	8.07***	0.01	0.14**	0.51***	0.21***	-0.62***	-0.18*
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.08)
Observations	8552	8552	2604	8552	8552	8520	8528

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

2.B Full Regressions Subsample High Understanding

Table 2.B.1: Full Regressions - CTB and Field Behavior for High Understanding

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
CTB	0.08	0.05**	0.01	0.01	0.04*	-0.09**	-0.08
	(0.05)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Female	0.19	-0.02	-0.02	-0.03	-0.06	0.19**	0.34***
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Age	0.01*	0.00	0.00**	0.00	0.01***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.21*	-0.03	0.03	-0.03	-0.09**	-0.05	-0.08
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.07)	(0.07)
Migration Background (1=native)	0.13	0.08*	0.03	-0.09*	0.00	-0.17*	-0.22*
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)	(0.09)
Marital Status (1=married)	0.19*	-0.02	-0.08*	-0.08*	-0.02	0.02	-0.01
	(0.10)	(0.03)	(0.04)	(0.03)	(0.03)	(0.07)	(0.07)
Children (1=yes)	0.01	0.01	-0.01	0.11**	0.00	-0.10	-0.02
	(0.11)	(0.03)	(0.04)	(0.04)	(0.04)	(0.08)	(0.08)
Household Wealth Other (Quintile=2)	0.29	0.05	0.06	-0.03	-0.05	-0.11	-0.06
	(0.16)	(0.04)	(0.05)	(0.05)	(0.04)	(0.10)	(0.10)
Household Wealth Other (Quintile=3)	0.46**	0.06	0.15**	-0.09	0.03	0.05	-0.11
	(0.17)	(0.04)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=4)	0.90***	0.22***	0.18**	-0.09	0.12*	-0.01	-0.20
	(0.16)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=5)	1.13***	0.21***	0.15*	0.08	0.33***	-0.08	-0.10
	(0.18)	(0.05)	(0.06)	(0.06)	(0.05)	(0.12)	(0.12)
Household Income (Quintile=2)	0.16	-0.02	-0.01	-0.06	-0.04	0.06	-0.05
	(0.17)	(0.04)	(0.07)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=3)	0.78***	0.06	-0.06	-0.01	-0.09*	0.03	0.03
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=4)	0.86***	-0.00	-0.01	-0.09*	-0.11*	0.07	-0.03
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=5)	0.92***	0.20***	0.01	-0.04	-0.05	-0.18	-0.18
	(0.17)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Constant Stack 1	8.26***	0.09	0.06	0.40***	0.17*	-0.56***	-0.36*
	(0.23)	(0.06)	(0.09)	(0.07)	(0.06)	(0.16)	(0.16)
Constant Stack 2	8.26***	0.08	0.06	0.40***	0.17*	-0.55***	-0.36*
	(0.23)	(0.06)	(0.09)	(0.07)	(0.06)	(0.16)	(0.16)
Observations	2228	2228	708	2228	2228	2222	2222

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.B.2: Full Regressions - PGp and Field Behavior for High Understanding

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
PGp	-0.02	0.10**	0.05	0.02	0.06	-0.18*	-0.07
	(0.13)	(0.04)	(0.04)	(0.04)	(0.04)	(0.08)	(0.09)
Female	0.17	-0.02	-0.02	-0.03	-0.06	0.19**	0.35***
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Age	0.01	0.00	0.00**	0.00	0.01***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.20*	-0.03	0.04	-0.03	-0.09**	-0.06	-0.09
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.07)	(0.07)
Migration Background (1=native)	0.14	0.08*	0.02	-0.09*	0.01	-0.17*	-0.23**
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)	(0.09)
Marital Status (1=married)	0.19	-0.02	-0.08*	-0.08*	-0.03	0.03	-0.01
	(0.10)	(0.03)	(0.04)	(0.03)	(0.03)	(0.07)	(0.07)
Children (1=yes)	0.02	0.01	-0.01	0.11**	0.00	-0.10	-0.03
	(0.11)	(0.03)	(0.04)	(0.04)	(0.04)	(0.08)	(0.08)
Household Wealth Other (Quintile=2)	0.29	0.05	0.06	-0.03	-0.05	-0.11	-0.06
	(0.16)	(0.04)	(0.05)	(0.05)	(0.04)	(0.10)	(0.10)
Household Wealth Other (Quintile=3)	0.48**	0.07	0.16**	-0.08	0.04	0.03	-0.13
	(0.17)	(0.04)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=4)	0.91***	0.22***	0.19**	-0.09	0.12*	-0.02	-0.22*
	(0.16)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=5)	1.15***	0.21***	0.15*	0.08	0.33***	-0.09	-0.11
	(0.18)	(0.05)	(0.06)	(0.06)	(0.05)	(0.12)	(0.12)
Household Income (Quintile=2)	0.16	-0.02	-0.01	-0.06	-0.04	0.06	-0.05
	(0.17)	(0.04)	(0.07)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=3)	0.78***	0.06	-0.06	-0.01	-0.09*	0.02	0.03
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=4)	0.86***	0.00	-0.01	-0.09*	-0.11*	0.07	-0.04
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=5)	0.93***	0.19***	0.00	-0.04	-0.05	-0.16	-0.18
	(0.17)	(0.05)	(0.06)	(0.05)	(0.05)	(0.11)	(0.11)
Constant Stack 1	8.24***	0.15*	0.10	0.41***	0.20**	-0.68***	-0.40*
	(0.24)	(0.07)	(0.09)	(0.08)	(0.07)	(0.16)	(0.17)
Constant Stack 2	8.24***	0.14*	0.10	0.41***	0.20**	-0.65***	-0.39*
	(0.24)	(0.07)	(0.09)	(0.07)	(0.07)	(0.16)	(0.17)
Observations	2228	2228	708	2228	2228	2222	2222

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.B.3: Full Regressions - SGsure and Field Behavior for High Understanding

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
SGsure	0.21	0.07*	0.05	0.08	0.05	-0.12	-0.15
	(0.13)	(0.04)	(0.05)	(0.04)	(0.04)	(0.09)	(0.09)
Female	0.20*	-0.01	-0.01	-0.02	-0.05	0.18**	0.33***
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Age	0.01*	0.00	0.00**	0.00*	0.01***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.20*	-0.03	0.03	-0.03	-0.09**	-0.06	-0.09
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.07)	(0.07)
Migration Background (1=native)	0.13	0.08*	0.02	-0.09*	0.01	-0.18*	-0.22**
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)	(0.09)
Marital Status (1=married)	0.19	-0.02	-0.08*	-0.08*	-0.02	0.03	-0.01
	(0.10)	(0.03)	(0.04)	(0.03)	(0.03)	(0.07)	(0.07)
Children (1=yes)	0.01	0.01	-0.01	0.11**	0.00	-0.11	-0.03
	(0.11)	(0.03)	(0.04)	(0.04)	(0.04)	(0.08)	(0.08)
Household Wealth Other (Quintile=2)	0.29	0.06	0.05	-0.02	-0.05	-0.11	-0.06
	(0.16)	(0.04)	(0.05)	(0.05)	(0.04)	(0.10)	(0.10)
Household Wealth Other (Quintile=3)	0.48**	0.07	0.16**	-0.09	0.04	0.03	-0.13
	(0.17)	(0.04)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=4)	0.91***	0.23***	0.18**	-0.09	0.13*	-0.03	-0.22*
	(0.16)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=5)	1.13***	0.21***	0.14*	0.08	0.33***	-0.09	-0.10
	(0.18)	(0.05)	(0.06)	(0.06)	(0.05)	(0.12)	(0.12)
Household Income (Quintile=2)	0.15	-0.02	-0.01	-0.07	-0.04	0.06	-0.04
	(0.17)	(0.04)	(0.07)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=3)	0.79***	0.06	-0.06	-0.01	-0.09*	0.02	0.02
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=4)	0.85***	-0.01	-0.01	-0.10*	-0.12**	0.08	-0.02
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=5)	0.90***	0.20***	0.00	-0.05	-0.05	-0.18	-0.17
	(0.17)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Constant Stack 1	8.32***	0.10	0.08	0.42***	0.18**	-0.58***	-0.40*
	(0.23)	(0.06)	(0.09)	(0.07)	(0.07)	(0.16)	(0.16)
Constant Stack 2	8.32***	0.10	0.09	0.42***	0.18**	-0.58***	-0.40*
	(0.23)	(0.06)	(0.09)	(0.07)	(0.07)	(0.16)	(0.16)
Observations	2228	2228	708	2228	2228	2222	2222

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.B.4: Full Regressions - PGhigh and Field Behavior for High Understanding

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
PGhigh	0.01	0.02	0.03	-0.01	0.03	-0.10*	-0.02
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Female	0.18	-0.02	-0.01	-0.03	-0.06	0.19**	0.35***
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Age	0.01	0.00	0.00**	0.00	0.01***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.20*	-0.03	0.04	-0.02	-0.09**	-0.06	-0.09
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.07)	(0.07)
Migration Background (1=native)	0.14	0.08*	0.02	-0.08	0.00	-0.17*	-0.23**
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)	(0.09)
Marital Status (1=married)	0.19	-0.02	-0.09*	-0.08*	-0.03	0.03	-0.01
	(0.10)	(0.03)	(0.04)	(0.03)	(0.03)	(0.07)	(0.07)
Children (1=yes)	0.02	0.01	-0.01	0.12**	0.00	-0.10	-0.03
	(0.12)	(0.04)	(0.04)	(0.04)	(0.04)	(0.08)	(0.08)
Household Wealth Other (Quintile=2)	0.29	0.05	0.06	-0.03	-0.05	-0.11	-0.06
	(0.17)	(0.04)	(0.06)	(0.05)	(0.04)	(0.10)	(0.10)
Household Wealth Other (Quintile=3)	0.48**	0.07	0.15**	-0.09	0.04	0.02	-0.13
	(0.17)	(0.04)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=4)	0.91***	0.23***	0.18**	-0.09	0.13*	-0.02	-0.22*
	(0.16)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=5)	1.15***	0.22***	0.15*	0.08	0.34***	-0.10	-0.12
	(0.18)	(0.05)	(0.06)	(0.06)	(0.05)	(0.12)	(0.12)
Household Income (Quintile=2)	0.16	-0.02	-0.01	-0.06	-0.04	0.07	-0.05
	(0.17)	(0.04)	(0.07)	(0.05)	(0.04)	(0.10)	(0.10)
Household Income (Quintile=3)	0.78***	0.05	-0.07	-0.01	-0.10*	0.04	0.03
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=4)	0.86***	-0.00	-0.02	-0.09*	-0.12**	0.09	-0.03
	(0.16)	(0.04)	(0.06)	(0.05)	(0.05)	(0.09)	(0.10)
Household Income (Quintile=5)	0.93***	0.20***	-0.00	-0.04	-0.05	-0.17	-0.19
	(0.17)	(0.05)	(0.06)	(0.05)	(0.05)	(0.11)	(0.11)
Constant	8.26***	0.09	0.09	0.39***	0.19**	-0.61***	-0.36*
	(0.24)	(0.07)	(0.09)	(0.07)	(0.07)	(0.16)	(0.16)
Observations	1114	1114	354	1114	1114	1111	1111

Notes: Coefficients are from OLS regressions with robust standard errors in parenthesis. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.B.5: Full Regressions - GRQ and Field Behavior for High Understanding

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
GRQ	-0.09	0.07***	0.05*	0.06***	0.12***	-0.10*	-0.08
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Female	0.15	0.00	0.00	-0.01	-0.02	0.17**	0.33***
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Age	0.01	0.00	0.00**	0.00*	0.01***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.20*	-0.03	0.03	-0.03	-0.09**	-0.06	-0.09
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Migration Background (1=native)	0.15	0.08*	0.01	-0.09*	-0.01	-0.17*	-0.22*
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)	(0.09)
Marital Status (1=married)	0.17	-0.00	-0.07*	-0.06	-0.00	0.01	-0.03
	(0.10)	(0.03)	(0.04)	(0.03)	(0.03)	(0.07)	(0.07)
Children (1=yes)	0.04	-0.00	-0.02	0.10**	-0.01	-0.10	-0.02
	(0.11)	(0.03)	(0.04)	(0.04)	(0.03)	(0.08)	(0.08)
Household Wealth Other (Quintile=2)	0.28	0.06	0.07	-0.02	-0.03	-0.12	-0.07
	(0.17)	(0.04)	(0.06)	(0.05)	(0.04)	(0.10)	(0.10)
Household Wealth Other (Quintile=3)	0.49**	0.07	0.15**	-0.09	0.03	0.03	-0.13
	(0.17)	(0.04)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=4)	0.92***	0.22***	0.19***	-0.09	0.12*	-0.02	-0.21*
	(0.16)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=5)	1.18***	0.20***	0.14*	0.07	0.30***	-0.07	-0.09
	(0.18)	(0.05)	(0.06)	(0.06)	(0.05)	(0.12)	(0.12)
Household Income (Quintile=2)	0.16	-0.01	-0.01	-0.06	-0.04	0.05	-0.05
	(0.17)	(0.04)	(0.07)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=3)	0.78***	0.05	-0.06	-0.02	-0.10*	0.03	0.03
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=4)	0.88***	-0.01	-0.01	-0.10*	-0.13**	0.09	-0.02
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=5)	0.94***	0.19***	0.01	-0.05	-0.06	-0.18	-0.18
	(0.17)	(0.05)	(0.06)	(0.05)	(0.05)	(0.11)	(0.11)
Constant Stack 1	8.27***	0.06	0.06	0.38***	0.14*	-0.52***	-0.33*
	(0.24)	(0.06)	(0.08)	(0.07)	(0.06)	(0.16)	(0.16)
Constant Stack 2	8.27***	0.06	0.06	0.38***	0.13*	-0.52***	-0.33*
	(0.24)	(0.06)	(0.08)	(0.07)	(0.06)	(0.16)	(0.16)
Observations	2228	2228	708	2228	2228	2222	2222

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.B.6: Full Regressions - FRQ and Field Behavior for High Understanding

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
FRQ	0.03	0.13***	0.04	0.06**	0.12***	-0.12**	-0.17***
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Female	0.19	0.02	-0.00	-0.01	-0.02	0.16*	0.29***
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Age	0.01	0.00	0.00**	0.00*	0.01***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.20*	-0.03	0.02	-0.03	-0.10**	-0.06	-0.08
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Migration Background (1=native)	0.13	0.07	0.02	-0.09*	-0.01	-0.17*	-0.21*
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)	(0.09)
Marital Status (1=married)	0.19	0.00	-0.08*	-0.07	-0.01	0.01	-0.04
	(0.10)	(0.03)	(0.04)	(0.03)	(0.03)	(0.07)	(0.07)
Children (1=yes)	0.02	-0.01	-0.01	0.11**	-0.01	-0.10	-0.01
	(0.11)	(0.03)	(0.04)	(0.04)	(0.03)	(0.08)	(0.08)
Household Wealth Other (Quintile=2)	0.29	0.07	0.06	-0.02	-0.03	-0.13	-0.08
	(0.17)	(0.04)	(0.06)	(0.05)	(0.04)	(0.10)	(0.10)
Household Wealth Other (Quintile=3)	0.48**	0.06	0.15**	-0.09	0.03	0.03	-0.12
	(0.17)	(0.04)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=4)	0.91***	0.21***	0.18**	-0.10	0.11*	-0.02	-0.20
	(0.16)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=5)	1.14***	0.17***	0.14*	0.06	0.29***	-0.06	-0.06
	(0.18)	(0.05)	(0.06)	(0.06)	(0.05)	(0.12)	(0.12)
Household Income (Quintile=2)	0.16	-0.01	-0.00	-0.06	-0.04	0.05	-0.05
	(0.17)	(0.04)	(0.07)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=3)	0.78***	0.05	-0.05	-0.01	-0.09*	0.03	0.03
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=4)	0.86***	-0.02	-0.01	-0.10*	-0.13**	0.09	-0.01
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=5)	0.92***	0.18***	0.00	-0.05	-0.06	-0.17	-0.16
	(0.18)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Constant Stack 1	8.25***	0.05	0.06	0.38***	0.13*	-0.51**	-0.31
	(0.24)	(0.06)	(0.09)	(0.07)	(0.06)	(0.16)	(0.16)
Constant Stack 2	8.25***	0.05	0.06	0.38***	0.13*	-0.52**	-0.31*
	(0.24)	(0.06)	(0.09)	(0.07)	(0.06)	(0.16)	(0.16)
Observations	2228	2228	708	2228	2228	2222	2222

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.B.7: Full Regressions - CRQ and Field Behavior for High Understanding

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
CRQ	-0.08	0.04*	0.03	0.05*	0.14***	-0.04	-0.09*
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.04)
Female	0.16	-0.02	-0.01	-0.02	-0.03	0.19**	0.33***
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Age	0.01	0.00	0.00**	0.00	0.01***	0.02***	0.01***
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.21*	-0.02	0.03	-0.02	-0.08**	-0.07	-0.10
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.07)	(0.07)
Migration Background (1=native)	0.14	0.08*	0.02	-0.09*	0.01	-0.18*	-0.23**
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)	(0.09)
Marital Status (1=married)	0.18	-0.01	-0.08*	-0.07*	-0.01	0.02	-0.02
	(0.10)	(0.03)	(0.04)	(0.03)	(0.03)	(0.07)	(0.07)
Children (1=yes)	0.02	0.01	-0.01	0.11**	0.01	-0.11	-0.03
	(0.11)	(0.03)	(0.04)	(0.04)	(0.03)	(0.08)	(0.08)
Household Wealth Other (Quintile=2)	0.28	0.06	0.05	-0.02	-0.03	-0.11	-0.07
	(0.16)	(0.04)	(0.05)	(0.05)	(0.04)	(0.10)	(0.10)
Household Wealth Other (Quintile=3)	0.48**	0.07	0.15**	-0.08	0.04	0.03	-0.13
	(0.17)	(0.04)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=4)	0.92***	0.22***	0.18**	-0.09	0.11*	-0.02	-0.21
	(0.16)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Household Wealth Other (Quintile=5)	1.18***	0.20***	0.13*	0.07	0.29***	-0.09	-0.09
	(0.18)	(0.05)	(0.06)	(0.06)	(0.05)	(0.12)	(0.12)
Household Income (Quintile=2)	0.15	-0.01	-0.02	-0.06	-0.02	0.05	-0.06
	(0.17)	(0.04)	(0.07)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=3)	0.76***	0.06	-0.06	-0.00	-0.07	0.02	0.01
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=4)	0.85***	0.01	-0.01	-0.09	-0.10*	0.07	-0.05
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=5)	0.92***	0.21***	0.01	-0.04	-0.03	-0.20	-0.20
	(0.17)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Constant Stack 1	8.28***	0.07	0.07	0.38***	0.11	-0.53***	-0.32*
	(0.24)	(0.06)	(0.08)	(0.07)	(0.06)	(0.16)	(0.16)
Constant Stack 2	8.29***	0.06	0.07	0.37***	0.10	-0.53**	-0.31
	(0.24)	(0.07)	(0.08)	(0.07)	(0.06)	(0.16)	(0.16)
Observations	2228	2228	708	2228	2228	2222	2222

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

Table 2.B.8: Full Regressions - HRQ and Field Behavior for High Understanding

	Financial				Occupation	Health	
	Savings log	Investments y/n	Investments ratio	Debt y/n	Self-Employed y/n	Distancing z-score	Handwashing z-score
HRQ	-0.05	0.01	0.03	0.04	0.07***	-0.27***	-0.28***
	(0.06)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.05)
Female	0.17	-0.02	-0.02	-0.02	-0.05	0.17**	0.32***
	(0.10)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Age	0.01	0.00	0.00**	0.00*	0.01***	0.01***	0.01**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Breadwinner (1=yes)	-0.19*	-0.03	0.02	-0.03	-0.10**	-0.03	-0.06
	(0.09)	(0.03)	(0.03)	(0.03)	(0.03)	(0.06)	(0.07)
Migration Background (1=native)	0.15	0.08*	0.01	-0.09*	-0.01	-0.12	-0.17
	(0.14)	(0.04)	(0.05)	(0.04)	(0.04)	(0.08)	(0.09)
Marital Status (1=married)	0.18	-0.02	-0.08*	-0.07*	-0.02	0.01	-0.03
	(0.10)	(0.03)	(0.04)	(0.03)	(0.03)	(0.07)	(0.07)
Children (1=yes)	0.02	0.01	-0.01	0.11**	0.00	-0.10	-0.01
	(0.11)	(0.03)	(0.04)	(0.04)	(0.04)	(0.08)	(0.08)
Household Wealth Other (Quintile=2)	0.28	0.06	0.06	-0.02	-0.03	-0.17	-0.12
	(0.17)	(0.04)	(0.06)	(0.05)	(0.04)	(0.10)	(0.10)
Household Wealth Other (Quintile=3)	0.48**	0.07	0.15**	-0.08	0.04	0.01	-0.14
	(0.17)	(0.04)	(0.06)	(0.05)	(0.05)	(0.10)	(0.10)
Household Wealth Other (Quintile=4)	0.91***	0.23***	0.18**	-0.09	0.13**	-0.04	-0.23*
	(0.16)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.10)
Household Wealth Other (Quintile=5)	1.15***	0.22***	0.14*	0.08	0.34***	-0.10	-0.12
	(0.18)	(0.05)	(0.06)	(0.06)	(0.05)	(0.12)	(0.12)
Household Income (Quintile=2)	0.16	-0.02	-0.02	-0.06	-0.04	0.05	-0.06
	(0.17)	(0.04)	(0.07)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=3)	0.78***	0.06	-0.06	-0.01	-0.09*	0.03	0.03
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=4)	0.87***	0.00	-0.02	-0.10*	-0.12**	0.08	-0.02
	(0.16)	(0.04)	(0.06)	(0.05)	(0.04)	(0.09)	(0.10)
Household Income (Quintile=5)	0.94***	0.20***	-0.00	-0.05	-0.05	-0.15	-0.15
	(0.17)	(0.05)	(0.06)	(0.05)	(0.05)	(0.10)	(0.11)
Constant Stack 1	8.27***	0.08	0.07	0.38***	0.13*	-0.43**	-0.23
	(0.24)	(0.06)	(0.09)	(0.07)	(0.07)	(0.16)	(0.15)
Constant Stack 2	8.28***	0.07	0.07	0.38***	0.13*	-0.43**	-0.23
	(0.24)	(0.07)	(0.09)	(0.07)	(0.07)	(0.16)	(0.15)
Observations	2228	2228	708	2228	2228	2222	2222

Notes: Coefficients are from a stacked 2SLS regression with duplicate measures as IVs, one constant per stack, and clustered standard errors (in parenthesis), following the ORIV approach (Equation 2.1). *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$

2.C Invitation Letters and Welcome Screens

Figure 2.C.1: Invitation Letter Wave 1 (Translated from Dutch)

[LOGO CBS // LOGO UM]

Dear Sir/Madam,

We would like to invite you to participate in a survey conducted by Maastricht University (UM) and Statistics Netherlands (CBS). This survey is about your preferences and opinions that play a role in making important social and economic decisions. **By participating in this survey, you contribute to increasing knowledge about the preferences and opinions of the Dutch population.** Many people have already participated in similar research. At the end of the survey, you will find out how your preferences compare to those of others.

For your participation in the study you can receive up to €175 and you have a chance to win an iPad Pro.

CBS is selecting a number of people for this survey. You are one of them. You represent many other residents of the Netherlands. It is therefore very important that you participate in this study.

The research.
The research takes place in two rounds. This is the invitation for the first round. If you participate now, you will receive an invitation for the second round in June. It is important for the research that you participate in both rounds. In both rounds you make a number of choices and answer questions that relate to your views on a number of important social and economic issues.

How can you participate?
You can participate in the survey via the internet. We use a secure connection to protect your data. The study can be found at the following internet address:

https://XXXX
Your login code: <Username>

We recommend using a laptop, desktop computer or tablet.

Win a reward.
If you participate in both rounds of the survey, you can receive up to €175. How much you receive depends on your choices and chance. You also have a chance to win an iPad Pro.

Your data is safe.
Your data is safe in all our investigations. You can read more about this at the end of this letter.

Do you have questions?
This research is being carried out in collaboration with the independent research agency Flycatcher. Flycatcher treats all your answers confidentially and anonymously. Do you have questions? You can contact research agency Flycatcher by e-mail (XXXX) and by telephone (XXXX). Flycatcher can be reached on working days between 8:30 AM and 5:00 PM.

You make an important contribution by participating in our research. We look forward to your participation soon and thank you for your time and cooperation.

Kind regards,
Arno Riedl – Professor of Public Economics (Maastricht University)
Hans Schmeets - Professor of Social Statistics (Maastricht University and CBS)

Maastricht University is collaborating with Statistics Netherlands (CBS) in this study. Research agency Flycatcher collects the data on behalf of Statistics Netherlands and Maastricht University.
In addition to the collected data, CBS also receives many files from other institutions. This contains, for example, data on population, work and income. Statistics Netherlands aggregates this information. In this way we work as economically as possible.
In this study, this data is aggregated with your answers in the study in an anonymous manner. Personal data can never be recognized in the information that Maastricht University receives from Statistics Netherlands.

Figure 2.C.2: Invitation Letter Wave 2 (Translated from Dutch)

[LOGO CBS // LOGO UM]

Dear Sir/Madam,

You recently participated in round 1 of our survey, conducted by Maastricht University and Statistics Netherlands (CBS). You have also indicated that you want to participate in the 2nd round of our research. Thank you very much for that!

We hereby invite you to participate in the 2nd round . As in the 1st round, the research in this 2nd round is about your preferences and opinions that play a role in making important social and economic decisions. It is **very important for our research that you also participate in this 2nd round**. By participating in both rounds you can also receive up to €175 and you have a chance to win an iPad Pro. You will also receive information about how your preferences compare to those of other participants in the survey.

How can you participate?
You can participate in the survey via the internet. We use a secure connection to protect your data. The study can be found at the following internet address:

https://XXXX
Your login code: <Username>

Participating in the study is best done with a laptop, desktop computer or tablet. We therefore recommend that you use one of these devices.

Do you have questions?
This research is carried out in collaboration with the independent research agency Flycatcher . Flycatcher treats all your answers confidentially and anonymously. Do you have questions? You can contact research agency Flycatcher by e-mail (XXXX) and by telephone (XXXX). Flycatcher can be reached on working days between 8:30 AM and 5:00 PM.

With your participation you make an important contribution to increasing knowledge about the preferences and opinions of the Dutch population. We look forward to your participation soon and would like to thank you in advance for your time and cooperation.

Kind regards,
Arno Riedl – Professor of Public Economics (Maastricht University)
Hans Schmeets - Professor of Social Statistics (Maastricht University and CBS)

Maastricht University is collaborating with Statistics Netherlands (CBS) in this study. Research agency Flycatcher collects the data on behalf of Statistics Netherlands and Maastricht University.

In addition to the collected data, CBS also receives many files from other institutions. This contains, for example, data about the population, their work and income. Statistics Netherlands aggregates this information. This is how we work as efficiently as possible.
In this study, this data is aggregated with your answers in the study in an anonymous manner. Personal data can never be recognized in the information that Maastricht University receives from Statistics Netherlands. The privacy of your data is therefore safe.

Figure 2.C.3: Welcome Screen Wave 1 (Translated from Dutch)

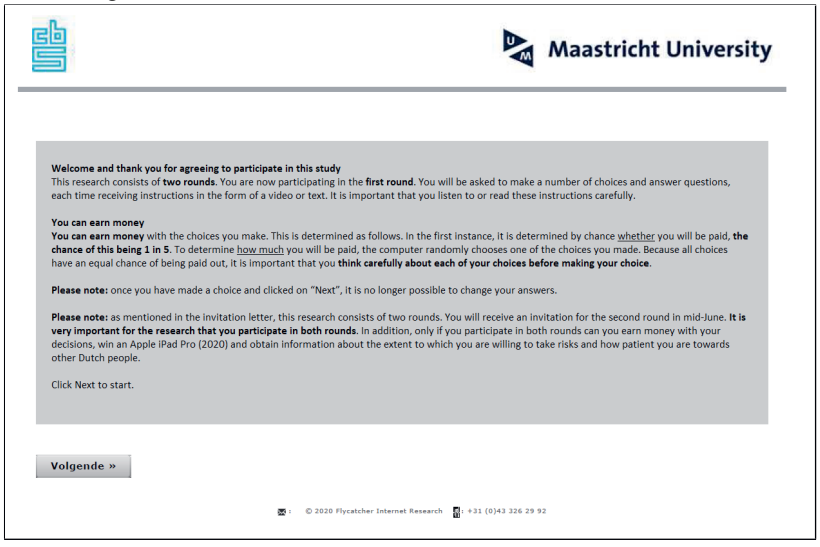


Figure 2.C.4: Welcome Screen Wave 2 (Translated from Dutch)

2.D Experimental Design

Convex Time Budget. The decision tasks were presented with information on the dates, probabilities, and possible allocations on one screen, using colors for clarity. Figure 2.D.1 shows an example of such a decision screen. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 2.D.2 shows the screen with instructions and Figure 2.D.3 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

Figure 2.D.1: Example Decision Screen CTB

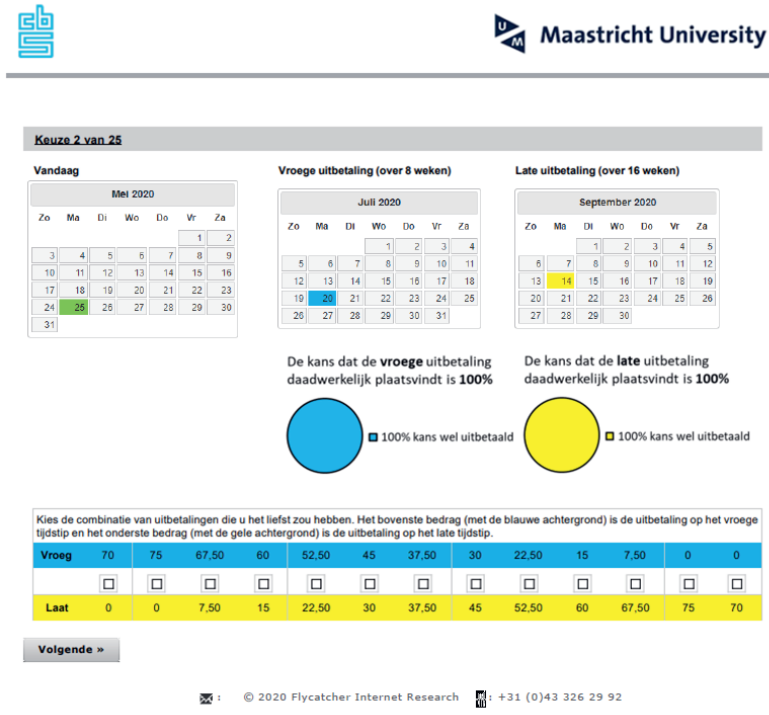


Figure 2.D.2: Instructions Screen CTB

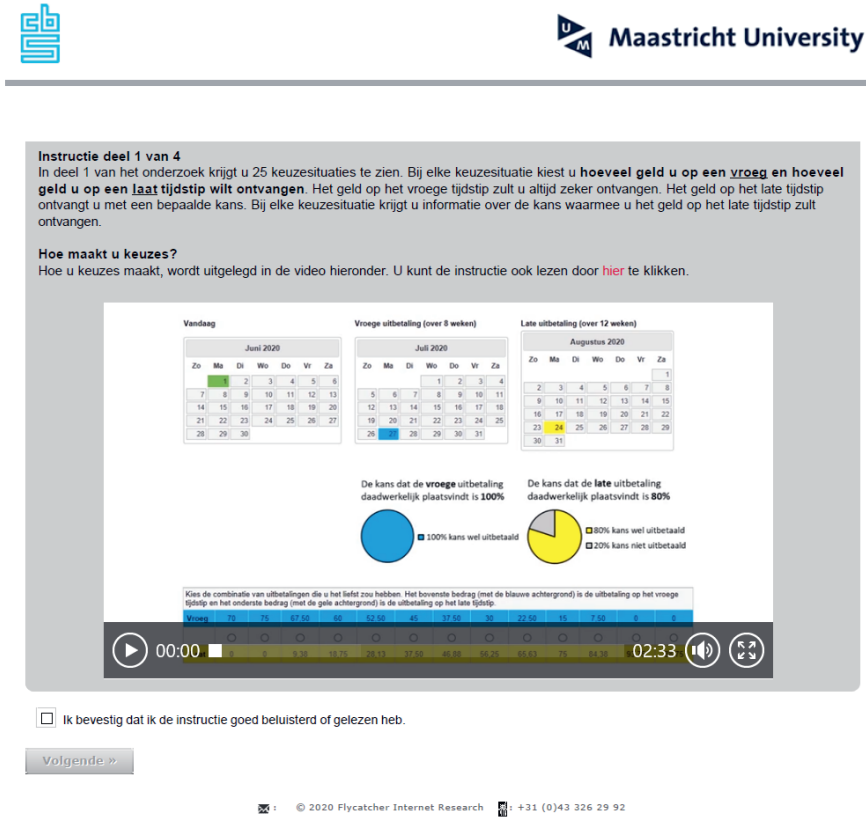


Figure 2.D.3: Written Instructions CTB (Translated from Dutch)

Instructions Part [1/4]
In part 1 of the study, you will be presented with 24 decision situations. In each decision situation, you choose **how much money you want to receive at an "early" and how much money you want to receive at a "late" time**. You will always receive the money at the early time with certainty. You will receive the money at the late time with a certain probability. In each decision situation, you will get information about the probability with which you will receive the money at the late time.

How do you make choices?
How you make choices is explained using the example below. The example shows a decision situation in which you are asked to divide a sum of money between an amount of money at an early time (in this example July 27) and an amount of money at a late time (in this example August 24). The times will be different in the choices you make later.

The calendars indicate times relevant to your choice. Today (June 1 in this example) is highlighted in green. The time of the early payout in each decision situation is exactly 8 weeks from today and is marked in blue. The time of the late payout in this example is 12 weeks from today and is highlighted in yellow. **The time of the late payment may differ between decision situations.**

Below the calendars you will see the probability of actually receiving the money at the late time. In this example, this probability is 80% (i.e. a probability of 8 in 10). **This probability can differ between decision situations.**

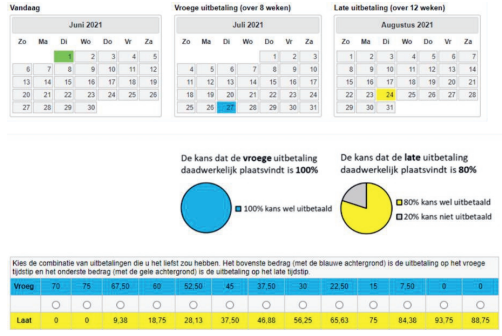
At the bottom of the page you can see the possible divisions of the amount of money in this example. The top amount (with the blue background) shows the amount of money you will receive at the early time. The bottom amount (with the yellow background) shows the amount of money you will receive at the late time with a certain probability.

Explanation of payments in this example. Do you choose:

70 ◉ 0 then you would receive **€70** at the early time (27 July) and receive **€0** at the late time (24 August)

30 ◉ 56,63 then you would receive **€30** at the early time (27 July) and receive **€56,63** at the late time (24 August) and is the probability that you receive the money at the late time 80%.

0 ◉ 93,75 then you would receive **€0** at the early time (27 July) and receive **€93,75** at the late time (24 August) and is the probability that you receive the money at the late time 80%.



Multiple Price Lists. The decision tasks were presented in lists of binary choices with information about the probabilities and outcomes. Table 2.3 in the main text and Tables 2.D.1 to 2.D.4 show the parameters used for the MPLs. Figure 2.D.4 shows an example of MPL-PGp 1 as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 2.D.5 shows the screen with instructions and Figures 2.D.6 and 2.D.7 show the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

Table 2.D.1: MPL-PGp 2

	Option A					Option B				
	p	€	p	€	EV(A)	p	€	p	€	EV(B)
#1	0.1	99	0.9	41	€47	0.1	134	0.9	19	€31
#2	0.2	99	0.8	41	€53	0.2	134	0.8	19	€42
#3	0.3	99	0.7	41	€58	0.3	134	0.7	19	€54
#4	0.4	99	0.6	41	€64	0.4	134	0.6	19	€65
#5	0.5	99	0.5	41	€70	0.5	134	0.5	19	€77
#6	0.6	99	0.4	41	€76	0.6	134	0.4	19	€88
#7	0.7	99	0.3	41	€82	0.7	134	0.3	19	€100
#8	0.8	99	0.2	41	€87	0.8	134	0.2	19	€111
#9	0.9	99	0.1	41	€93	0.9	134	0.1	19	€123
#10	1	99	0	41	€99	1	134	0	19	€134

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table 2.D.2: MPL-SGsure 1

	Option A			Option B				
	p	€	EV(A)	p	€	p	€	EV(B)
#1	1	52	€52	0.5	30	0.5	130	€80
#2	1	57	€57	0.5	30	0.5	130	€80
#3	1	63	€63	0.5	30	0.5	130	€80
#4	1	68	€68	0.5	30	0.5	130	€80
#5	1	73	€73	0.5	30	0.5	130	€80
#6	1	78	€78	0.5	30	0.5	130	€80
#7	1	82	€82	0.5	30	0.5	130	€80
#8	1	88	€88	0.5	30	0.5	130	€80
#9	1	94	€94	0.5	30	0.5	130	€80
#10	1	101	€101	0.5	30	0.5	130	€80

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table 2.D.3: MPL-SGsure 2

	Option A				Option B				
	p	€		EV(A)	p	€	p	€	EV(B)
#1	1	39		€39	0.33	20	0.67	110	€80
#2	1	46		€46	0.33	20	0.67	110	€80
#3	1	56		€56	0.33	20	0.67	110	€80
#4	1	64		€64	0.33	20	0.67	110	€80
#5	1	70		€70	0.33	20	0.67	110	€80
#6	1	75		€75	0.33	20	0.67	110	€80
#7	1	79		€79	0.33	20	0.67	110	€80
#8	1	84		€84	0.33	20	0.67	110	€80
#9	1	88		€88	0.33	20	0.67	110	€80
#10	1	93		€93	0.33	20	0.67	110	€80

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table 2.D.4: MPL-PGhigh

	Option A					Option B				
	p	€	p	€	EV(A)	p	€	p	€	EV(B)
#1	0.5	90	0.5	70	€80	0.5	103	0.5	35	€69
#2	0.5	90	0.5	70	€80	0.5	109	0.5	35	€72
#3	0.5	90	0.5	70	€80	0.5	115	0.5	35	€75
#4	0.5	90	0.5	70	€80	0.5	122	0.5	35	€79
#5	0.5	90	0.5	70	€80	0.5	128	0.5	35	€82
#6	0.5	90	0.5	70	€80	0.5	131	0.5	35	€83
#7	0.5	90	0.5	70	€80	0.5	138	0.5	35	€87
#8	0.5	90	0.5	70	€80	0.5	153	0.5	35	€94
#9	0.5	90	0.5	70	€80	0.5	170	0.5	35	€103
#10	0.5	90	0.5	70	€80	0.5	186	0.5	35	€111

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Figure 2.D.4: Example Decision Screen MPL-PGp

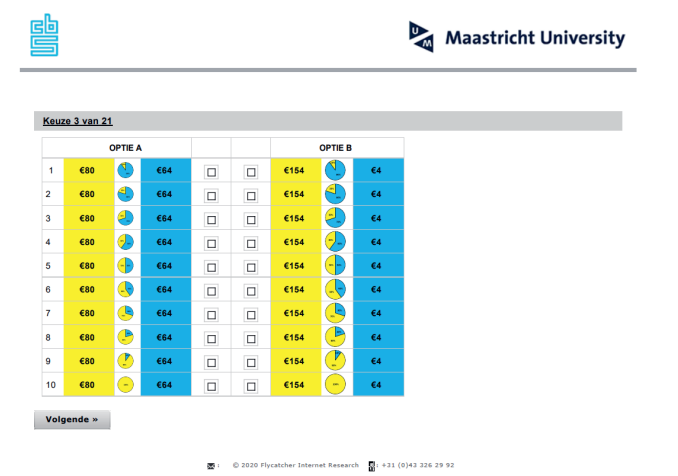


Figure 2.D.5: Instructions Screen MPL

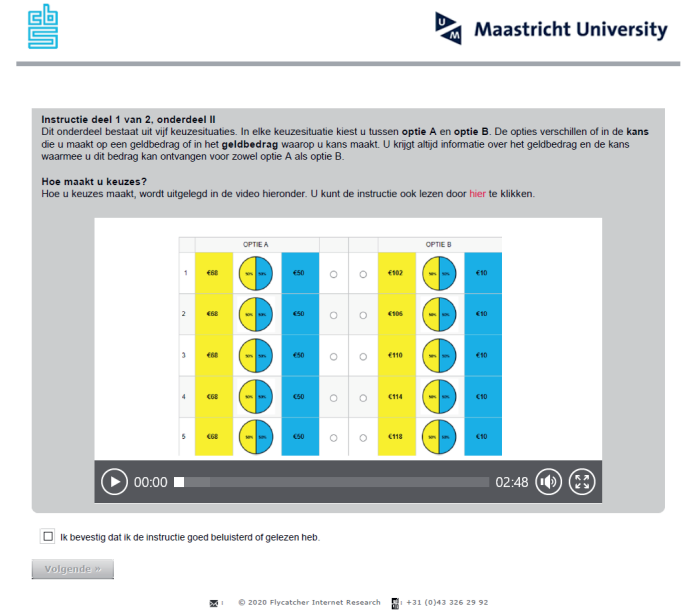


Figure 2.D.6: Written Instructions MPL Page 1 (Translated from Dutch)

Instructions part [1.2/2]
This part consists of five decision situations. In each decision situation you choose between **option A** and **option B**. The options differ either in the **probability** of earning a sum of money or in the **amount** of money that you can earn with a certain probability. You will always receive information about the amount of money and the chance with which you can receive this amount for both option A and option B.

How do you make choices?
How you make choices is explained using the two examples below.

Decision situation Type 1
The screen shows a decision situation in which you are asked to make a choice between **option A** and **option B** in **each row** (in this example 1 to 5).

In this example, **Option A is the same in every row**. In this option you will see two amounts, in this example **€68** (the amount with the yellow background) and **€50** (the amount with the blue background). If you choose option A, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts. In this example, **the probability of receiving €68 is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €50 is 50%** (i.e. a 5 in 10 chance).

In this example, **Option B is different in each row**. In this option you will see two amounts in each row, in this example **€102 or more** (the amount with the yellow background) and **€10** (the amount with the blue background). If you choose option B, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts. In this example, **the probability of receiving €102 or more is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €10 is 50%** (i.e. a 5 in 10 chance).

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

On the next page are instructions for the example of Decision Situation Type 2.

Figure 2.D.7: Written Instructions MPL Page 2 (Translated from Dutch)

Decision situation Type 2
The screen shows a decision situation in which you are asked to make a choice between **option A** and **option B** in **each row** (in this example 1 to 5).

	OPTIE A					OPTIE B		
1	€68		€50	○	○	€106		€10
2	€68		€50	○	○	€106		€10
3	€68		€50	○	○	€106		€10
4	€68		€50	○	○	€106		€10
5	€68		€50	○	○	€106		€10

Option A is different in each row. In this option you will see two amounts, in this example **€68** (the amount with the yellow background) and **€50** (the amount with the blue background). If you choose option A, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts and differs per row. For example, in row 1, the top row, **the probability of receiving €68 is 10%** (i.e. a 1 in 10 chance) and **the probability of receiving €50 is 90%** (i.e. a 9 in 10 chance). For example, in row 5, the bottom row, **the probability of receiving €68 is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €50 is 50%** (i.e. a 5 in 10 chance).

Option B is different in each row. In this option you see two different amounts than in option A, in this example **€106** (the amount with the yellow background) and **€10** (the amount with the blue background). If you choose option B, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts and differs per row. The probability of receiving the amount with the yellow or blue background are the same in option A as in option B in each row. For example, in row 1, the top row, **the probability of receiving €106 is 10%** (i.e. a chance of 1 in 10) and **the probability of receiving €10 is 90%** (i.e. a 9 in 10 chance). For example, in row 5, the bottom row, **the probability of receiving €106 is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €10 is 50%** (i.e. a 5 in 10 chance).

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

3

Personal Life Events and the Stability of Preferences

Adapted from: Bokern, P., Linde, J., Riedl, A., Schmeets, H., & Werner, P. (2022b). Personal life events and individual risk preferences. *Netspar Design Paper*, *210*.

Abstract

Using a large sample of the Dutch working population, this study investigates if and how risk, time, and social preferences are affected by personal life events. Specifically, we investigate whether changes in marital status and parenthood are associated with changes in preferences. Preferences are elicited with survey questions (stated preferences) as well as methods where financial incentives are used (revealed preferences). Using register data of Statistics Netherlands, personal life events are linked to the elicited preferences of participants. Besides immediate effects of personal life events, we explore how long such effects last. Recent marriage is found to have some effect on revealed social preferences, but not on risk and time preferences. Recent divorce is associated with less revealed risk-taking and higher stated patience but has no effect on social preferences. Recent parenthood is associated with more revealed risk-taking and higher stated patience but not with social preferences.

3.1 Introduction

Life events such as marriage, divorce, and parenthood can precipitate a substantial change in how people live their lives. It changes everyday activities, expectations from others, and the position a person holds in society. Sociologists have therefore long studied the importance of life events as key determinants of how people's lives unfold (Bernardi et al., 2019). Despite this, psychologists generally hold the belief that people's personality is so well-established by the time people reach adulthood that personality traits should be largely unaffected. Nevertheless, empirical studies have shown that life events can affect personality later in life (Bühler et al., 2023). In this chapter, we therefore investigate whether life events also produce a shock to some fundamental characteristics that are considered to be important for economic behavior: time, risk, and social preferences.

Knowing when preferences change is important because preferences are fundamental exogenous variables in economic models (Becker, 1978). Because of that, some argue that we should not argue about preferences but rather look for explanations other than preferences to explain changes in behavior (Stigler & Becker, 1977). However, identifying differences in preferences has been used to explain differences in behavior between people (Croson & Gneezy, 2009) and populations (Chan et al., 2020). Time preferences correlate with saving decisions (e.g., Falk et al., 2018; Sutter et al., 2013), risk preferences play a role in investment decisions (e.g., Beauchamp et al., 2017; Dohmen et al., 2011; Menkhoff and Sakha, 2017), and social preferences affect people's willingness to donate money (e.g., Almas et al., 2020; Falk et al., 2018). Knowledge of preferences is similarly essential when providing advice, to the extent that many jurisdictions require financial service providers to ascertain their clients' risk preferences prior to providing advice or when making decisions on their client's behalf.

A number of studies examine the effect of life events on preferences (discussed in more detail in Section 3.2). In this chapter, we contribute to this literature by investigating whether personal life events (marriage, divorce, and parenthood) affect risk, time, and social preferences. We do so by eliciting these preferences in a large heterogeneous sample of the Dutch population and linking participants' answers to register data from Statistics Netherlands (CBS). Our contribution is threefold. First, we assess fundamental economic preferences in three domains, which affect many crucial decisions such as career choices or saving and investment decisions. While risk preferences have received attention in the past, the impact of the personal life events we study

on time and social preferences has not been directly examined before. Second, we elicit preferences using both quantitative incentivized tasks and qualitative self-reports, whereas existing studies rely on self-reports only. This allows us to directly examine whether different elicitation methods lead to different conclusions regarding the impact of life events on preferences. Third, we use register data to identify life events rather than relying on self-reports, thereby potentially reducing reporting errors and identifying life events in an inconspicuous manner.

We find that life events appear to have some short-run effects on risk, time, and social preferences. In particular, the observed effects are almost exclusively found for those individuals who experienced the life event in the most recent year before the study, whereas no effects are found for those who experienced the life event in the two years before that. For risk preferences, we find that people who divorced most recently took fewer risks in one of our revealed preference measures, but no effects are found for the other revealed preference measure and the stated preference measure. People who most recently had their first child took more risks in one of our revealed preference measures, but again no effects are found for the other revealed preference measure and the stated preference measure. Marriage was not found to affect risk preferences. For time preferences, we find that people who most recently divorced or experienced first parenthood assess themselves as more patient. However, for both groups, no effects are found in the incentivized measures. Marriage is not found to affect time preferences. For social preferences, we find that people who married most recently behaved more pro-social, but no effect was found on the stated preference measure. Divorce and first parenthood are not found to affect social preferences.

The remainder of this chapter is organized as follows. In Section 3.2, we review the literature on the effect of life and other events on preferences. In Section 3.3, we describe the procedures of the study, the design of experimental measures and survey questions, the life events that we consider from the CBS register data, and our identification strategy. The results are presented in Section 3.4. Section 3.5 provides a discussion and concludes.

3.2 Related Literature

Given the obvious impact of life events on the way people live their lives it is not surprising that a substantial body of literature has studied the impact of life events on behavior. For example, Bertocchi et al. (2011), Chris-

tiansen et al. (2015), Love (2009), and Zetterdahl (2015) find significant effects of changes in marital status (such as marriage, divorce, or loss of partner) on financial behavior. However, a change in marital status often also implies a change in financial resources, circumstances, and responsibilities, which may directly lead to a change of behavior without a change in preferences. Therefore, such studies do not allow us to draw inferences about the effect of life events on preferences. Important direct evidence on this matter is provided by Hanewald and Kluge (2014) using the German Socioeconomic Panel (GSOEP). They find that married people hold riskier investments, but at the same time, they state to be less willing to take risks compared to singles. This seemingly contradictory observation suggests that the riskier investment may be due to a change in circumstances and/or risk capacity that comes with marriage, rather than with a change in risk preferences, emphasizing the importance of direct measures of preferences rather than measures of related behavior.

In addition to Hanewald and Kluge (2014), several other studies consider the effect of life events on risk preferences directly using stated preference measures. Browne et al. (2016) and Görlitz and Tamm (2020) investigate the impact of several life events on stated risk preferences, using longitudinal data from the GSOEP. Browne et al. find that people who marry or become parents state to be more risk-averse. In addition, separation from a partner, but not divorce, is found to correlate with reduced stated risk aversion. Görlitz and Tamm focus on the effect of becoming a parent and consider when a change in risk preferences occurs, relative to the birth, and how long this lasts. They find that both men and women state higher risk aversion before the birth of their first child and a few years after that, before the stated risk preference converges back to the original level. At the same time, this shift in stated risk preferences is not found to translate into less risky behavior in the labor market (examined with risks of injury at work and the variance of earnings). Kettlewell (2019) explores the impact of a variety of life events in a panel data set of Australian households, based on a survey measure of self-assessed risk preferences, and finds that risk aversion is stronger shortly after the birth of the first child and that this effect vanishes in subsequent periods. Research on the effect of life events on time and social preferences is substantially less common and direct evidence on the effect of marriage, divorce, or parenthood on either social or time preferences is nonexistent.[1]

[1]For time preferences, there is some evidence that a negative income shock leads to more impulsive decisions (Mellis et al., 2018). For social preferences, Vollhardt (2009) proposes that altruism is "born of suffering" and cites supporting empirical studies for the idea that nega-

Indirect evidence for the impact of life events on preferences is provided by studies that do not look at individual life events, but large-scale societal shocks such as natural disasters or economic crises. Chuang and Schechter (2015) review this literature and conclude that the evidence is inconclusive. Sometimes such events appear to have an effect, but at other times not, without a clear picture emerging of either characteristics of the event or the environment in which it occurs explaining the presence, absence, or direction of effects. Recently a substantial body of literature on the effect of the COVID-19 pandemic on risk, time, and social preferences has been added to this. Umer (2023b) reviews this literature which, similar to the literature on society-wide events, does not yield a uniform picture either. Some studies find significant effects, but often in opposite directions, while other studies find no significant change in preferences during the COVID-19 pandemic.[2]

3.3 Data and Methods

We start by introducing our sample and data collection procedures. Then, we discuss our methods for eliciting risk, time, and social preferences using both revealed and stated preference elicitation methods. Lastly, we describe the life events we consider (marriage, divorce, and first parenthood) and our identification strategy.

3.3.1 Data Collection

The data were collected in a two-wave online survey in May and June of 2020 conducted in collaboration with CBS and research agency Flycatcher. CBS

tive life events increase altruism. This empirical basis consists mostly of clinical psychological studies and considers relatively extreme and traumatic events. However, it is unclear how such an effect could be extrapolated to the more "mundane" life events that we study.

[2]Further indirect evidence comes from the literature on the impact of life events on personality in psychology. This literature is extensive and, just as the economics literature on preferences, often finds contradictory results. However, given the extensive nature of the literature, there is room for a meta-analysis to illuminate overall patterns. Bühler et al. (2023) performed such a meta-analysis, which includes results for the three life events we consider. Neither marriage nor child-birth appears to have a substantial effect on any of the Big 5 personality dimensions, although child-birth has a consistently negative effect on self-esteem and life satisfaction. Divorce does however appear to affect many dimensions of personality, decreasing emotional stability and increasing both agreeableness and openness. How such changes might relate to changes in preferences is not self-evident. However, it might suggest that divorce is more likely to have an impact on preferences than marriage or parenthood, as is the case for personality.

selected the stratified random sample, which allowed us to link the survey and experimental data with register data. Flycatcher programmed the online survey and experiments and collected the data. A total of 18,000 employees and 18,000 self-employed in the Netherlands were randomly selected and invited through physical letters to participate in the online study (see Appendix 3.B).[3] In total, 4,282 participants completed both waves. Table 3.3.1 reports basic demographics of the sample.

Table 3.3.1: Descriptive Statistics - Individual and Household Characteristics

	Mean	SD	Min	Max	N
Marital Status (=Single)	0.32	0.47	0	1	4,282
Marital Status (=Married)	0.59	0.49	0	1	4,282
Marital Status (=Widowed)	0.01	0.09	0	1	4,282
Marital Status (=Divorced)	0.09	0.28	0	1	4,282
Parenthood (=Yes)	0.67	0.47	0	1	4,282
Sex (=Female)	0.43	0.50	0	1	4,282
Age	47.44	12.19	20	87	4,282
Occupation (=Employee)	0.56	0.50	0	1	4,282
Occupation (=Self-Employed)	0.35	0.48	0	1	4,282
Occupation (=Other)	0.09	0.28	0	1	4,282
Migration Background (=Native)	0.87	0.34	0	1	4,282
Education Level (=Low)	0.04	0.21	0	1	4,282
Education Level (=Middle)	0.25	0.43	0	1	4,282
Education Level (=High)	0.44	0.50	0	1	4,282
Education Level (=Unknown)	0.26	0.44	0	1	4,282
Cognitive Reflection	1.56	1.11	0	3	4,282
Financial Literacy	3.43	1.15	0	5	4,282
Household Wealth	372,474	769,906	-949,069	20,337,954	4,276
Household Income	44,350	80,122	-23,839	4,844,076	4,276

Notes: Data refers to January 1, 2020 (for marital status, children, occupation, education level, household wealth, and household income) or to the date on which the participant filled in the first wave of the survey (for age). Marital status (=married) includes registered partnership. Household income refers to disposable income and is adjusted for size and composition of the household. Household wealth and income may be negative for self-employed individuals who incurred losses with their business. There are six observations missing for household wealth and income. Cognitive reflection and financial literacy were asked in the second wave of the survey using three questions from the cognitive reflection test (Frederick, 2005) and five financial literacy questions (Lusardi and Mitchell, 2014), respectively.

The survey included a large set of measures in the same order for each participant.[4] The median completion time was 46 and 51 minutes respectively in

[3]The survey was part of a larger project "Understanding and Improving Pension Savings", which focused explicitly on the self-employed and hence self-employed individuals were over-sampled.

[4]In addition to risk, time, and social preferences, the study collected other incentivized experi-

Waves 1 and 2. One in five participants, among those who completed both waves, was randomly selected for payment based on their decisions in one randomly selected incentivized task. Possible earnings ranged from €0 up to €186 depending on the task. The average earning among the participants selected for payment was €77.10 ($SD = 41.33$).[5] In addition, one iPad was raffled off among the participants who completed both waves. Participants were fully informed about the procedures in advance.

3.3.2 Preference Measures

We elicited risk, time, and social preferences using both revealed and stated preference methods. Revealed risk and time preferences were elicited jointly in Wave 1 with the convex time budget (CTB; Andreoni and Sprenger, 2012a) and separately in Wave 2 with several multiple price lists (MPLs) in the spirit of Holt and Laury (2002) and Coller and Williams (1999), respectively. Revealed social preferences were elicited in Wave 1 with a modified version of the solidarity game by Selten and Ockenfels (1998). Stated preferences were elicited in both waves with the general risk question (GRQ), general time question (GTQ), and altruism question (AQ) following Falk et al. (2016, 2022). Below, we discuss the methods (see Appendix 3.C for more details) and how preferences are inferred from decisions. All measures are standardized (z-score) for analysis.

CTB. The CTB (Andreoni and Sprenger, 2012a; Potters et al., 2016) jointly elicits risk and time preferences. Participants received 24 decision tasks sequentially, in which they were asked to divide a budget of €75 between an earlier date, 8 weeks from the day of participation, and a later date, either 16 weeks or 24 weeks from the day of participation.[6] Money allocated to the early date was always paid out for sure, whereas money allocated to later dates was paid with a 100%, 90%, 70%, or 50% chance. Money allocated to the later date also paid an interest rate of 0%, 4%, or 16% over the delay period. The choice sets from which participants received were discretized into

ments and survey measures, not reported here. See http://bit.ly/pbbs-main for a complete overview of the material.

[5] Participants thefore earned €15.42 on average, which is roughly 50% above the net hourly minimum wage in the Netherlands at the time of the study (this was €9.70 per hour for a 40-hour workweek, see https://bit.ly/wage-Dutch, last retrieved May 2023).

[6] One additional practice task that participants received is excluded from the analysis.

13 predefined allocations, to simplify the decisions. We also included a comprehension and attention check by means of dominated options.[7]

To infer risk and time preferences from participants' decisions, we take the following approach. For risk preferences, we compare allocations in decision tasks with risk (that is, the decision situations where the later payoff was obtained with a 90%, 70%, or 50% chance) to allocations in their risk-free counterpart (that is, the decision situation where the later payoff was obtained with a 100% chance) and classify each pair as a risk-averse, risk-neutral, or risk-seeking choice. Specifically, a pair of allocations is classified as risk-neutral if the participant allocates the same amount of money in both tasks, risk-averse if the participant allocates more money to the early period in the task that involves risk (compared to its risk-free counterpart), and risk-seeking if the participant allocates less money to the early period in the task that involves risk (compared to its risk-free counterpart).[8] To create an aggregate measure, we count the number of choices classified as risk-averse (with weight=-1), risk-neutral (with weight=0), and risk-seeking (with weight=1) separately for the two different time periods (i.e., 8 and 16 weeks and 8 and 24 weeks) and then take the average (hereafter "rCTB"). Larger values of this variable are thus associated with a stronger tendency of the participant to take risks in the task.

For time preferences, we simply take the average euro amount a participant allocates to late period in risk-free decision situations, thus, decision situations where the later payoff was obtained with a 100% chance (hereafter "tCTB"). Larger values for this variable are thus associated with more patience of the decision-maker. This measure is therefore based on six decisions as each participant was confronted with three different implied interest rates (0%, 4%, or 16% over the period of delay) for two delay durations (8 or 16 additional weeks).

MPL. We implemented several MPLs to elicit risk and time preferences separately in the spirit of Holt and Laury (2002) and Coller and Williams (1999),

[7] For example, in decision #1 participants could choose between the following allocations: [70,0]; [75,0]; [67.50,7.50]; [60,15]; [52.50,22.50]; [45,30]; [37.50,37.50]; [30,45]; [22.50,52.50]; [15,60]; [7.50,67.50]; [0,75]; [0,70]. The first and the last allocations are dominated as they pay out less money for sure. In total, there are 513 (12%) participants who make at least one dominated choice in the CTB tasks. We control for dominated choices in further analyses.

[8] If an individual makes a corner choice in both the decision with risk and their risk-free counterpart, then we categorize the pairs of corner choices at the early (late) date as risk-averse (seeking).

respectively. An MPL is a list of binary decision situations. For risk preferences, participants are asked to choose between a safer and riskier lottery in each decision situation. The list is designed such that either the safer or the riskier lottery becomes more attractive when moving down the list. The point where the participant switches to the option that becomes more attractive provides an indication of the risk preference. In this study, participants made ten choices in each MPL. We take the average number of risky lottery choices over all five MPLs as a measure for risk preference (hereafter "rMPLs").[9] Larger values of this variable are thus associated with a stronger tendency of the participant to take risks in the task.

For time preferences, participants are asked to choose between an early and late payment in each decision situation. The list is designed such that waiting for the late payment becomes more attractive when moving down the list. The point where the participant switched to the option at the later date provides an indication of their time preference. In this study, participants made nine binary decisions between €75 at an early date (8 weeks from the day of participation) and varying amounts at a later date (16 or 24 weeks from the day of participation). Moving down the list, the amounts at the later date increased, yielding interest rates between 0% and 26.7% over the delay period. We take the average number of later date choices over both MPLs as a measure for time preference (hereafter "tMPLs"). Thus, higher values for this measure imply more patience of the decision-maker.[10]

Solidarity Game. We implemented a modified version of the solidarity game by Selten and Ockenfels (1998) to elicit social preferences. In our implementation, following Riedl et al. (2019), participants were anonymously matched with another participant in the study and were informed that one of the following four possible situations could occur: (i) both participants receive €80 (with 50% probability), (ii) they receive €80 but the matched other receives nothing (with 20% probability), (iii) they

[9] We implemented three different types of MPLs, see Appendix 3.C. In Chapter 1, we show that correlations between the different types of MPLs range from .60 to .88 when controlling for measurement error.

[10] We did not enforce consistency in participants' choices in the MPLs, meaning that participants could switch multiple times as well as in the "wrong" direction (i.e., the option that is becoming less attractive). Moreover, we include a dominated option in two MPLs for risk preferences. The number of participants who make at least one inconsistent choice in the MPLs is 739 (17%) for risk preferences and 167 (4%) for time preferences. The number of participants who make at least one dominated choice in the MPLs for risk preferences is 283 (7%). We control for inconsistent and dominated choices in further analyses.

receive nothing but the matched other receives €80 (with 20% probability), (iv) both receive nothing (with 10% probability). We then elicited solidarity preferences towards different age groups using the strategy method (Selten, 1967). Specifically, for situation (ii) in which they received money and the other did not, they had to decide how much they were willing to transfer if their matched other was (a) a young participant (between 16 and 34 years), (b) a middle-aged participant (between 35 and 64 years), and (c) an old participant (65 years and older). We take the average amount of money sent over all age groups as a measure for solidarity preferences (hereafter "SG"). Larger values of this variable are thus associated with higher pro-social preferences in the task.

GRQ, GTQ, AQ. These self-reported survey questions are based on the work by Falk et al. (2016, 2022). For risk preferences (GRQ), participants self-identify as being more or less willing to take risk in general on an 11-point Likert scale from "not at all willing to take risks" (0) to "very willing to take risk" (10). For time preferences (GTQ), participants identified themselves as being more or less willing to give something up today to benefit from it in the future on an 11-point Likert scale ranging from "not at all willing" (0) to "very willing" (10). The question was asked twice, once referring to the near future and once referring to the distant future. We take the average of both questions.[11] For social preferences (AQ), participants self-identified as being more or less willing to give to a good cause without expecting anything in return on an 11-point Likert scale ranging from "not at all willing" (0) to "very willing" (10). All survey questions were asked in both waves of the study. We use the average response for our analysis.

Table 3.3.2 provides summary statistics of our preference measures. The table reports the measures in their original unit, but the data are standardized (z-score) for later analysis.

3.3.3 Life Events

The register data from CBS allows us to identify life events that potentially have an impact on preferences. We focus on marriage, divorce, and first parenthood. These three life events are commonly studied and it is likely that

[11] The Pearson correlation between these two measures is 0.76 in Wave 1 and 0.73 in Wave 2.

Table 3.3.2: Descriptive Statistics - Risk, Time, and Social Preference Measures

	Unit	Mean	SD	Mdn	Min	Max	N
Risk							
rCTB	Σ RA (-1), RN (0), RS (1) Choices, Avg over 2 Sets	-3.52	4.64	-4	-9	9	4,282
rMPL	# Risky Choices (0-10), Avg over 5 MPLs	3.83	1.68	4	0	10	4,282
GRQ	Likert Item (0-10), Avg over 2 Items*	5.61	1.81	6	0	10	4,282
Time							
tCTB	Avg €allocated to future in risk-less choices	43.21	17.87	50	0	75	4,282
tMPL	# Patient Choices (0-9), Avg over 2 MPLs	4.35	2.59	5	0	9	4,282
GTQ	Likert Item (0-10), Avg over 2 Items*	6.61	1.63	7	0	10	4,282
Social							
SG	Avg €(out of €80) sent to others	26.76	16.53	30	0	80	4,282
AQ	Likert Item (0-10), Avg over 2 Items*	6.31	2.19	7	0	10	4,282

Notes: The table lists summary statistics for the risk, time, and social preference measures considered in our study. RA = Risk Averse, RN = Risk Neutral, RS = Risk Seeking. *We asked the same question in both waves.

they have an influence on people's lives and position in society. To identify these events, we consider changes in the participants' marital status or number of children. Given that the CBS data are on an annual basis, we classify participants according to their status at the start of each calendar year and compare this to their status at the start of the previous calendar year. For example, marital status is recorded as either single, married, divorced, or widowed. If an individual is classified as married in year T (i.e., start of 2020) but not in $T-1$ (i.e., start of 2019), then we infer that the individual has experienced the life event "marriage" in year $T = 2019$. Similarly, a person not classified as divorced in year $T-1$ but classified as divorced in year T has experienced a divorce in year T. As to parenthood, we track the number of children that an individual has. If this number increased from zero in year $T-1$ to more than zero in year T, we know that the individual became a parent for the first time in year T.

Table 3.3.3 lists the frequency of the different life events (marriage, divorce, and first parenthood) in our sample. The table shows that in each time period, the different life events are experienced by a relatively small number of individuals. For instance, 64 individuals in our sample (or 1.5% of the observations) married in 2019, the year before our study was conducted. A similar number of individuals got married in other years. As can be expected, the number of individuals who get divorced is even smaller, with 21 (0.5%) in 2018 and 2019, and 29 (0.7%) in 2017. Finally, the number of individuals in our sample who experienced first parenthood ranges between 41 (1.0%) in 2017 and 61 (1.4%) in 2019.

Table 3.3.3: Descriptive Statistics - Life Events

	2019	2018	2017
Married			
Observations	64	82	69
% of Total Sample	1.5	1.9	1.6
Divorced			
Observations	21	21	29
% of Total Sample	0.5	0.5	0.7
First Parenthood			
Observations	61	57	41
% of Total Sample	1.4	1.3	1.0

Notes: The table lists the number of individuals who experienced a specific life event in the three years (2017-2019) prior to the study. The total number of participants in our study is N = 4,282.

3.3.4 Identification strategy

To analyze the effects of life events on preferences, we take the following approach. We regress the relevant preferences measure on three dummy variables that indicate whether a participant experienced the life event in question in any of the three years preceding the survey. We run such regressions for each of the three life events we study.[12] To these regressions, we add demographic, socioeconomic, and individual background characteristics of the participant. These background characteristics include the states associated with the life events we study, i.e. dummy variables for parenthood and marital status.

The estimated coefficients of the life event dummy variables show whether participants who recently experienced a life event exhibit different preferences than participants who experienced the life event less recently (i.e., more than three years ago). For example, a person who has experienced the life event "marriage" in 2019 is identified as both married and recently married,

[12]Controlling for one life event when looking at the impact of another life event, might be preferable from an econometric perspective. If the experiences are correlated, then including only dummy variables of one event could lead to biased coefficients. However, participants experiencing multiple life events are sufficiently rare that such a bias is unlikely to be substantial. For ease of presentation, we present separate regressions for each of the three life events studied in the following section. For completeness, Table 3.A.5 in Appendix 3.A presents results of regression analyses where all life events are simultaneously included. This additional analysis does not result in different conclusions.

while someone who has been married for more than three years is simply identified as married, but not as recently married. Moreover, the combined effect of the life event dummy variables and the demographic status variables of the life event in question inform us whether participants who experienced the life event recently are different in their preferences from those who never experienced the life event. For example, we can compare a recently married person with a single person (the reference category of our marital status variable) by taking the sum of the estimated effects of being married and being recently married. In a similar manner, we can compare a recently divorced person with someone who divorced more than three years ago or with a married person, and someone who recently experienced first parenthood with individuals who experienced first parenthood longer than three years ago and individuals without children.

Importantly, our data allows us only to identify short-term effects of life events. Any long-term or permanent effects will not be captured by our life event dummy variables, but rather by the relevant demographic controls. The coefficients of these demographic controls cannot be interpreted causally because this could either indicate a difference between people more or less likely to experience a life event or a long-term effect of the life event. For example, if we find that married people are more risk-averse than single people that could be because marriage makes people permanently more risk-averse, or because risk-averse people are more likely to be married. The effect of having experienced a life event in a particular year has a more plausible causal interpretation because, in this case, we are comparing only those who experienced the life event, but at different points in time. Any difference can therefore plausibly be attributed to the recency of the event, rather than to a prior difference between people experiencing the life event.

3.4 Results

We start by investigating how our risk, time, and social preference measures relate to demographic and socioeconomic background characteristics of participants. Then, we discuss how our preference measures are affected by recently experiencing marriage, divorce, or first parenthood respectively.

3.4.1 Preferences and Individual Characteristics

As a first step, we explore how our preference measures relate to the demographic and socioeconomic background of our participants. We estimate simple OLS regression models with our preference measures as dependent variables. In all models, our independent variables include demographic characteristics (marital status, children y/n, sex, age, and migration background), socioeconomic characteristics (occupation status, education, wealth, and income), cognitive skills (financial literacy and cognitive reflection)[13], and variables measuring participants' understanding of experimental tasks, both subjectively (understanding of instructions and confidence in choices for the CTB, the rMPLs, the tMPLs, and the SG) and objectively (number of inconsistent choices in the rMPLs and the tMPLs and dominated choices in the CTB and the rMPLs).

Table 3.4.1 presents the regression results. The table reveals several interesting patterns as well as discrepancies between revealed and stated preference measures. Concerning risk preferences, we find in models (1), (2), and (3) that women are less willing to take risks compared to men ($p < 0.001$ for all), self-employed individuals are more willing to take risks compared to employees ($p = 0.029$, $p = 0.035$, $p < 0.001$, respectively), and individuals in the highest income tertile are more willing to take risks compared to those in the lower income tertile ($p = 0.019$, $p < 0.001$, $p < 0.001$, respectively). In addition, we find evidence in favor of a U-shaped pattern for age in all three models (joint significance tests of age and age squared yield $p = 0.037$, $p < 0.001$, $p < 0.001$, respectively for models 1, 2, and 3). These results are in line with previous studies (e.g., Dohmen et al., 2011; Donkers et al., 2001; Falk et al., 2018; von Gaudecker et al., 2011). People who are married state to have a lower willingness to take risks compared to singles (model 3, $p < 0.001$), which is consistent with the findings of Dohmen et al. (2011), but they do not differ in their risk-taking in revealed preference methods (models 1 and 2). In a similar vein, people with children state to have a higher willingness to take risks compared to people without children (model 3, $p < 0.001$), but no differences are found in revealed preference methods (models 1 and 2). Finally, cognitive factors (financial literacy and CRT) are correlated with the GRQ and the rMPLs, but not the rCTB. In particular, individuals with higher scores on CRT state to be less willing to take risks ($p < 0.001$), but take more risks in the

[13] Financial literacy is measured with five questions from Lusardi and Mitchell (2014) and cognitive reflection is measured with three questions form the cognitive reflection test (CRT) by Frederick (2005).

rMPLs ($p = 0.001$). Individuals with higher scores on financial literacy state to be more willing to take risks ($p < 0.001$) and take more risks in the rMPLs ($p = 0.017$).

Concerning time preferences, we find that higher education and cognitive reflection are both associated with more patience across all measures ($p = 0.029$ for high education in model 4, and $p < 0.001$ otherwise). This relation between patience and education is in line with Perez-Arce (2017), but opposed to Tawiah (2022). Women and married individuals state to be less patient compared to men ($p < 0.001$) and singles ($p = 0.041$), respectively, but do not differ in their patience in revealed preference methods. Previous studies on this topic more commonly found that women are more patient than males (Martorano et al., 2015 review the literature), although Martorano et al. add to this literature and find, as we do, that women appear less patient. Age is negatively related to stated patience ($p < 0.001$), but not with behavior in the incentivized tasks. Self-employed individuals state to be more patient than employees ($p < 0.001$) but are less patient in both the tMPLs ($p = 0.025$) and the tCTB ($p = 0.006$), which goes against Andersen et al. (2014) who found that (Danish) entrepreneurs were more patient in incentivized tasks. Higher financial literacy is also associated with higher stated patience ($p < 0.001$) but does not affect behavior in revealed preference methods. Natives are more patient than non-natives in both the tCTB ($p < 0.001$) and tMPLS ($p = 0.009$) but do not differ from non-natives in their stated patience. Finally, higher wealth is associated with more patience in the tMPLs, but not the tCTB. Individuals in the highest wealth tertile also state to be more patient compared to those in the lowest tertile ($p < 0.001$). A positive relation between patience and wealth is in line with the findings of Epper et al. (2020).

Concerning social preferences, we find that demographics overall have little explanatory power in the SG. We do observe a positive relationship with age ($p < 0.001$), which we also observe for stated altruism ($p < 0.001$), and is commonly found in the literature (Sparrow et al., 2021). For stated altruism, we find that women ($p < 0.001$), people with higher cognitive reflection ($p = 0.046$), and people in the highest income quintile state to be more altruistic ($p = 0.002$). In addition, people with a higher education level state to be more altruistic compared to people with a middle education level ($p < 0.001$), whereas those with a lower education level state to be less altruistic ($p = 0.001$). Higher altruism for women is a common finding in the literature (Croson & Gneezy, 2009), but note that in contrast to this literature, we only find a gender effect in self-reported altruism and not in revealed solidarity.

Table 3.4.1: Regressions - Preferences and Individual Characteristics

	Risk Preferences			Time Preferences			Social Preferences	
	(1) rCTB	(2) rMPL	(3) GRQ	(4) tCTB	(5) tMPL	(6) GTQ	(7) SG	(8) AQ
Marital Status (=Married)	-0.00	-0.01	-0.20***	-0.07	-0.05	-0.08*	0.05	0.00
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Marital Status (=Widowed)	-0.30*	0.05	-0.15	0.15	0.05	0.18	0.02	-0.18
	(0.12)	(0.10)	(0.15)	(0.17)	(0.12)	(0.15)	(0.18)	(0.13)
Marital Status (=Divorced)	0.11	0.00	0.08	-0.04	-0.04	0.09	0.01	-0.04
	(0.07)	(0.03)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)
Parenthood (=Yes)	0.06	0.04	0.15***	-0.01	-0.02	0.04	-0.04	-0.03
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Sex (=Female)	-0.22***	-0.12***	-0.34***	0.06	0.05	-0.12***	0.04	0.29***
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.02	-0.02**	-0.05***	0.00	-0.00	-0.02***	0.01***	0.01***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age Squared	0.00	0.00**	0.00***					
	(0.00)	(0.00)	(0.00)					
Migration Background (=Native)	0.03	0.01	0.03	0.21***	0.11**	-0.02	0.03	-0.09
	(0.04)	(0.02)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)
Occupation Status (=Self-Employed)	0.08*	0.04*	0.35***	-0.09**	-0.07*	0.18***	0.07	0.04
	(0.04)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Occupation Status (=Other)	-0.01	-0.01	0.13*	-0.14*	-0.05	0.08	0.02	0.02
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Education Level (=Low)	0.04	-0.05	0.02	-0.00	0.03	-0.07	-0.03	-0.28**
	(0.08)	(0.04)	(0.07)	(0.08)	(0.07)	(0.08)	(0.09)	(0.09)
Education Level (=High)	0.04	0.02	-0.02	0.08*	0.18***	0.14***	0.05	0.17***
	(0.04)	(0.02)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
Education Level (=Unknown)	0.06	0.00	0.01	-0.02	0.05	-0.01	0.06	0.00
	(0.05)	(0.02)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Household Wealth (Quintile=2)	0.09	0.03	-0.07	0.09	0.14**	0.08	0.05	-0.05
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=3)	0.06	-0.05	-0.10*	0.05	0.13**	0.06	-0.07	-0.06
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=4)	0.06	-0.03	-0.20***	0.07	0.24***	0.10	-0.06	-0.03
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=5)	0.05	-0.01	-0.06	0.10	0.31***	0.25***	-0.11	-0.07
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Household Income (Quintile=2)	0.00	0.01	0.03	0.07	-0.02	-0.03	0.05	-0.09
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=3)	0.02	0.03	0.08	0.01	-0.03	0.01	0.07	0.01
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=4)	0.09	0.07**	0.19***	0.11*	-0.04	0.02	0.06	0.07
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=5)	0.13*	0.12***	0.23***	0.08	-0.10*	0.03	0.06	0.17**
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Cognitive Reflection	0.01	0.03***	-0.07***	0.09***	0.09***	0.07***	-0.00	0.03*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial Literacy	0.02	0.02*	0.08***	0.02	0.02	0.10***	-0.02	0.02
	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
Constant	0.45	-0.13	1.11***	-0.58***	-0.40**	0.47***	-0.67***	-0.60***
	(0.26)	(0.14)	(0.23)	(0.13)	(0.12)	(0.09)	(0.13)	(0.10)
Understanding Controls	X	X	X	X	X	X	X	X
Observations	4271	4269	4276	4271	4271	4276	4276	4276
Adjusted R^2	0.042	0.080	0.091	0.034	0.057	0.125	0.014	0.045

Notes: Robust standard errors in parentheses. Baselevels: Marital Status (=Single), Parenthood (=No), Sex (=Male), Migration Background (=Non-Native), Occupation Status (=Employee), Education Level (=Middle), Household Wealth (Quintile=1), Household Income (Quintile=1). Age squared is added to the regressions for risk preferences as the data suggests that there is a nonlinear relationship between age and risk preferences. Table 3.A.1 in Appendix 3.A reports the full regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.4.2 Preferences and Life Events

As set out in Section 3.3.4, we identify the effect of recent life events by adding dummy variables indicating whether a participant experienced a life event in any of the three years prior to the survey. The coefficients of these dummy variables capture the extent to which the preferences of someone who experienced a life event recently differ from those of someone who experienced the life event earlier. In addition, we show joint effects that identify how the preferences of participants who recently experienced a life event differ from participants who are in the state these individuals were in before experiencing the life event.

Marriage

Table 3.4.2 shows the results of (recent) marriage on risk (models 1, 2, and 3), time (models 4, 5, 6), and social preferences (models 7 and 8). The coefficients for the life event dummy variables (i.e., Married in 2019, 2018, and 2017) provide a comparison of those recently married and those married for more than three years. The bottom panel in the table shows p-values of the joint effect of being married and recently married compared to being single.

We first discuss the relationship between being recently married and risk preferences in models (1), (2), and (3). As shown in models (1) and (2), we find that individuals who have been married for more than three years do not differ from single people in their revealed risk preferences. At the same time, they state to be less willing to take risks ($p < 0.001$) compared to single people, as shown in model (3). Looking at the life event dummy variables and the p-values of the joint effects, we find no evidence that recently married participants differ from those married for more than three years or single people when it comes to their revealed risk preferences. Concerning stated risk preferences, we find that participants married in 2018 and 2019 do not statistically significantly differ from those married for more than three years, but also not from single people. Participants who married in 2017 state to be less willing to take risks compared to singles ($p = 0.020$), similar to those married for more than three years.[14]

[14] A possible interpretation of this result is that participants who married in 2018 or 2019 are more similar to singles than to people who have been married for more than three years, while this is no longer the case for those married in 2017. We hesitate to draw any conclusions, however, because the differences between those married in 2018 or 2019 and those married for more than three years (i.e., the life event dummy variables) are also not statistically significant.

Table 3.4.2: Regressions - Marriage and Preferences

	Risk Preferences			Time Preferences			Social Preferences	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	rCTB	rMPL	GRQ	tCTB	tMPL	GTQ	SG	AQ
Marital Status (=Married)	-0.01	-0.02	-0.21***	-0.09*	-0.07	-0.09*	0.04	0.01
	(0.05)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Marital Status (=Widowed)	-0.30*	0.04	-0.16	0.13	0.03	0.17	0.02	-0.17
	(0.12)	(0.10)	(0.15)	(0.17)	(0.12)	(0.15)	(0.18)	(0.13)
Marital Status (=Divorced)	0.10	-0.00	0.07	-0.05	-0.05	0.08	0.01	-0.04
	(0.07)	(0.04)	(0.06)	(0.07)	(0.06)	(0.06)	(0.07)	(0.06)
Married in 2019	0.04	0.10	0.10	0.11	0.15	0.13	0.28*	0.08
	(0.14)	(0.07)	(0.12)	(0.14)	(0.12)	(0.09)	(0.13)	(0.12)
Married in 2018	0.02	0.04	0.14	-0.04	0.06	-0.09	-0.17	-0.11
	(0.10)	(0.05)	(0.11)	(0.12)	(0.10)	(0.10)	(0.12)	(0.12)
Married in 2017	0.04	0.01	-0.02	0.20	0.09	0.02	0.06	-0.13
	(0.11)	(0.05)	(0.10)	(0.11)	(0.10)	(0.10)	(0.12)	(0.11)
Constant	0.44	-0.15	1.07***	-0.60***	-0.42***	0.47***	-0.67***	-0.59***
	(0.26)	(0.14)	(0.23)	(0.13)	(0.12)	(0.09)	(0.13)	(0.10)
Observations	4271	4269	4276	4271	4271	4276	4276	4276
Adjusted R^2	0.042	0.080	0.090	0.034	0.057	0.125	0.015	0.045
Comparison Recently Married to Single (p-values)								
Joint Effect 2019	0.794	0.216	0.321	0.896	0.501	0.613	0.016	0.428
Joint Effect 2018	0.911	0.757	0.530	0.271	0.883	0.093	0.275	0.416
Joint Effect 2017	0.748	0.812	0.020	0.292	0.879	0.562	0.389	0.305

Notes: Robust standard errors in parentheses. Regressions additionally control for parenthood, sex, age, age-squared, migration background, occupation status, education, wealth, income, cognitive reflection, financial literacy, and subjective and objective measures of understanding for the experimental tasks. Table 3.A.2 in Appendix 3.A reports the full regressions. $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

The relationship between recent marriage and time preferences is presented in models (4), (5), and (6). We find that individuals who have been married for more than three years behave slightly less patient in the tCTB ($p = 0.047$) but not in the tMPLs. They also state to be less patient in the GTQ ($p = 0.044$) compared to singles. No effect is found for recent marriage on our time preference measures, nor do recently married participants exhibit significantly different time preferences than single participants.

Models (7) and (8) report the results for the relationship between recent marriage and social preferences. We find that individuals who have been married for more than three years do not differ from singles in terms of the money they sent on average in the SG or their stated altruism in the AQ. However, the results in model (7) suggest that individuals who married most recently (in 2019) sent more to others on average in the SG compared to individuals who married more than three years ago ($p = 0.037$) and compared to singles ($p = 0.016$). At the same time, the results in model (8) show that recently married individuals do not differ from those married for more than three years or from singles in their stated altruism.

In sum, we find no effect of recent marriage on risk and time preferences. There is suggestive evidence that individuals who married most recently exhibit more pro-social preferences compared to singles and those who married for a longer time as they transferred more to others on average in the SG, although no difference is found for stated altruism.

Divorce

Table 3.4.3 shows the regression results of (recent) divorce on risk (models 1, 2, and 3), time (models 4, 5, 6), and social preferences (models 7 and 8). The coefficients for the life event dummy variables (i.e., Divorced in 2019, 2018, and 2017) provide a comparison of those recently divorced and those divorced for more than three years. The bottom panel in the table shows p-values of the joint effect of being divorced and recently divorced relative to being married.[15]

Concerning risk preferences, we find that individuals who divorced more than three years ago do not differ from singles in their risk preferences across all measures. Looking at the most recently divorced (in 2019), however, we find evidence in models (1) and (2) that they take less risk in the rMPLs and rCTB compared to those who have been divorced for more than three years ($p = 0.073$ and $p = 0.001$, respectively) and compared to married individuals in the case of rMPLs ($p = 0.003$). A weaker effect in the same direction is found for people who divorced in 2018. We do not find any effects for stated risk preferences in model (3).

Models (4), (5), and (6) report the relationship between divorce and time preferences. We find that individuals who are divorced for more than three years do not differ from singles in terms of their revealed and stated time preferences. Looking at the life event dummy variables in models (4) and (5), we also find no differences in revealed time preferences for those who recently divorced. In Model (6), we do find some evidence that individuals who divorced most recently (in 2019) state to be more patient than those divorced for more than three years ($p = 0.029$) and married people ($p = 0.001$). We find a similar, but weaker, effect for those divorced in 2018 compared to married people ($p = 0.042$).

[15] We report the joint effects with "married" as a reference group because getting divorced implies changing the marital status from married to divorced.

Table 3.4.3: Regressions - Divorce and Preferences

	Risk Preferences			Time Preferences			Social Preferences	
	(1) rCTB	(2) rMPL	(3) GRQ	(4) tCTB	(5) tMPL	(6) GTQ	(7) SG	(8) AQ
Marital Status (=Divorced)	0.14	0.04	0.10	-0.04	-0.02	0.06	-0.01	-0.03
	(0.08)	(0.04)	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)
Marital Status (=Married)	-0.00	-0.01	-0.20***	-0.07	-0.05	-0.08*	0.05	0.00
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Marital Status (=Widowed)	-0.29*	0.05	-0.15	0.15	0.05	0.18	0.02	-0.18
	(0.12)	(0.10)	(0.15)	(0.17)	(0.12)	(0.15)	(0.18)	(0.13)
Divorced in 2019	-0.30	-0.35***	0.05	0.04	-0.25	0.31*	0.23	-0.07
	(0.17)	(0.10)	(0.21)	(0.20)	(0.17)	(0.14)	(0.19)	(0.24)
Divorced in 2018	-0.14	-0.23*	-0.22	0.04	-0.19	0.25	-0.03	-0.04
	(0.18)	(0.11)	(0.21)	(0.19)	(0.22)	(0.20)	(0.23)	(0.25)
Divorced in 2017	-0.12	-0.00	-0.14	-0.13	0.01	-0.10	0.10	-0.10
	(0.22)	(0.09)	(0.21)	(0.23)	(0.18)	(0.19)	(0.21)	(0.23)
Constant	0.44	-0.15	1.10***	-0.58***	-0.40**	0.47***	-0.67***	-0.60***
	(0.26)	(0.14)	(0.23)	(0.13)	(0.12)	(0.09)	(0.13)	(0.10)
Observations	4271	4269	4276	4271	4271	4276	4276	4276
Adjusted R^2	0.042	0.082	0.090	0.034	0.057	0.125	0.014	0.045
Comparison Recently Divorced to Married (p-values)								
Joint Effect 2019	0.318	0.003	0.089	0.686	0.199	0.001	0.351	0.647
Joint Effect 2018	0.982	0.094	0.718	0.687	0.473	0.042	0.668	0.758
Joint Effect 2017	0.911	0.603	0.451	0.658	0.775	0.822	0.848	0.554

Notes: Robust standard errors in parentheses. Regressions additionally control for parenthood, sex, age, age-squared, migration background, occupation status, education, wealth, income, cognitive reflection, financial literacy, and subjective and objective measures of understanding for the experimental tasks. Table 3.A.3 in Appendix 3.A reports the full regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The relationship between divorce and social preferences is presented in models (7) and (8). We do not find any significant difference between divorced and single individuals, nor do we find any effect of a recent divorce compared to people who have been divorced for more than three years. Comparing recently divorced participants to married participants also does not reveal a significant effect of divorce on social preferences.

In sum, we find that individuals who divorced recently, especially in 2019, take fewer risks in our revealed preference measures compared to married individuals and those who have been divorced for more than three years. Individuals who divorced in the last year before the study also state to be slightly more patient, although they do not differ in their revealed patience. We find no robust effects of being recently divorced on social preferences.

First Parenthood

Table 3.4.4 shows the results of recently becoming a parent for the first time on risk (models 1, 2, and 3), time (models 4, 5, 6), and social preferences (models 7 and 8). The coefficients for the life event dummy variables (i.e., First Parenthood in 2019, 2018, and 2017) provide a comparison of those who experienced first parenthood recently compared to those who experienced first parenthood more than three years ago. The bottom panel in the table shows p-values of the joint effect of being a parent and recently experiencing parenthood compared to not having children.

We first discuss the relationship between being first parenthood and risk preferences in models (1), (2), and (3). As shown in models (1) and (2), we find that participants who became parents more than three years ago do not differ from individuals without children in their revealed risk preferences. At the same time, they state to be more willing to take risks as shown in model (3) ($p = 0.001$). Looking at the life event dummy variables, we find that those who experienced first parenthood most recently (in 2019) take more risks in the rMPLs than participants who have been parents for more than three years ($p = 0.004$) and than participants without children ($p = 0.001$). We do not

Table 3.4.4: Regressions - First Parenthood and Preferences

	Risk Preferences			Time Preferences			Social Preferences	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	rCTB	rMPL	GRQ	tCTB	tMPL	GTQ	SG	AQ
Parenthood (=Yes)	0.04	0.02	0.14**	-0.03	-0.03	0.03	-0.02	-0.03
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
First Parenthood in 2019	0.11	0.17**	0.04	0.20	0.15	0.18	-0.17	-0.01
	(0.13)	(0.06)	(0.12)	(0.13)	(0.12)	(0.10)	(0.12)	(0.12)
First Parenthood in 2018	0.12	0.05	0.04	0.12	0.10	0.03	-0.22	0.05
	(0.12)	(0.06)	(0.12)	(0.14)	(0.12)	(0.13)	(0.13)	(0.14)
First Parenthood in 2017	0.26	0.07	0.26	0.12	-0.04	-0.20	0.11	-0.09
	(0.18)	(0.06)	(0.14)	(0.13)	(0.11)	(0.15)	(0.15)	(0.16)
Constant	0.39	-0.18	1.07***	-0.61***	-0.41***	0.46***	-0.64***	-0.60***
	(0.26)	(0.14)	(0.23)	(0.13)	(0.13)	(0.09)	(0.13)	(0.10)
Observations	4271	4269	4276	4271	4271	4276	4276	4276
Adjusted R^2	0.042	0.081	0.091	0.034	0.057	0.125	0.015	0.045
Comparison Recent First Parenthood to Having No Children (p-values)								
Joint Effect 2019	0.244	0.001	0.146	0.168	0.303	0.033	0.097	0.762
Joint Effect 2018	0.176	0.237	0.152	0.526	0.597	0.627	0.059	0.887
Joint Effect 2017	0.100	0.127	0.005	0.488	0.533	0.268	0.552	0.479

Notes: Robust standard errors in parentheses. Regressions additionally control for marital status, sex, age, age-squared, migration background, occupation status, education, wealth, income, cognitive reflection, financial literacy, and subjective and objective measures of understanding for the experimental tasks. Table 3.A.4 in Appendix 3.A reports the full regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

find the effect for those experiencing first parenthood in 2018 or 2017. Moreover, we find no effects of recently becoming a parent for the rCTB or stated preferences measured with the GRQ, except that those who experienced first parenthood in 2017 stated to be more willing to take more risks compared to individuals who do not have children ($p = 0.005$).

The relationship between parenthood and time preferences is presented in models (4), (5), and (6). We find that participants with children for longer than three years do not differ from those who do not have children in terms of their revealed and stated time preferences. We do find that participants who most recently became parents (in 2019) state to be more patient than participants without children ($p = 0.033$). No differences are found for revealed time preferences.

Models (7) and (8) report the results for the relationship between recent first parenthood and social preferences. We find that individuals who became parents more than three years ago do not differ from singles in terms of the money they sent in the SG or in terms of their stated altruism in the AQ. We also find no differences for participants who recently became parents.

In sum, we find that those who experienced first parenthood most recently (in 2019) take slightly more risks in the rMPLs and state to be slightly more patient in the GTQ. We find no effects of recent parenthood on social preferences.

3.5 Discussion and Conclusion

Given that life events can affect people's personality (Bühler et al., 2023) and that preferences have been found to change in response to external events (see Chuang and Schechter, 2015 and Umer, 2023b) it seems plausible that preferences might be affected by life events that people experience. Indeed earlier studies found that people may become more risk averse after marriage or becoming a parent (Hanewald and Kluge, 2014, Browne et al., 2016, Kettlewell, 2019, and Görlitz and Tamm, 2020). In this study, we extend this to include time and social preferences in addition to risk preferences. Furthermore, we elicit preferences not only via self-reports but also with incentivized tasks.

Our results indicate that the relation between our preference measures and demographic and socioeconomic characteristics of individuals is largely in line with results reported in previous studies, although especially for time

and social preferences we find some associations that go against earlier findings. When it comes to the effect of recently experiencing a life event in the form of marriage, divorce, or first parenthood, we find that it has some short-run impact on our risk, time, and social preferences measures. Concerning recent marriage, we find suggestive evidence that most recently married individuals behave more pro-social, but we find no effect on risk and time preferences. Divorce is associated with less risk-taking in our revealed preference measures, in particular for those most recently divorced. In addition, we find evidence that most recently divorced individuals assess themselves as more patient and that there is no effect on social preferences. Recent parenthood is associated with more risk-taking in one of our incentivized experimental measures, but not the other. In contrast to previous literature, we do not find an effect on stated risk preferences. In addition, we find evidence that individuals who experienced recent parenthood assess themselves as more patient and find no effect on social preferences. The suggestion drawn from the literature on personality, that divorce might have more substantial effects than marriage or parenthood (Bühler et al., 2023), is not confirmed as we find some effects for each of these three life events.

Interestingly, all the effects we observe concern either stated or revealed preferences, but generally not both. Specifically, we find that individuals who married recently display more pro-social behavior but do not differ in their stated altruism. Individuals who divorced most recently take less risk in both the incentivized measures but do not differ in their stated risk aversion. In addition, recently divorced participants state to be less patient and, while they also behave slightly less patiently in the incentivized experimental tasks, the results are not statistically significant. First parenthood is associated with more risk-taking in our incentivized experimental tasks but not with stated risk aversion. Individuals who recently experienced first parenthood also state to be more patient, and while they behave slightly more patiently in the incentivized experimental tasks, the effects are not statistically significant. This potential discrepancy indicates that the difference between stated and revealed preferences needs to be explored more carefully.

In our study, we have to rely on cross-sectional data and consequently can only account for individual heterogeneity to a limited extent. A more effective way to control for heterogeneity would be to follow individuals over a longer period while repeatedly eliciting preferences, as is being done by several studies using only stated preferences. However, to the best of our knowledge, no study to this date has elicited data on revealed preferences repeatedly over an extended period of time for a large and heterogeneous

population sample. Our diverging results for stated and revealed preferences indicate that it would be important to repeatedly elicit both hypothetical and incentivized preference measures over a longer period, while at the same time tracking changes in the personal circumstances of individuals.

More generally, the relatively low number of observations of individuals in our data set who experience specific life events means that we cannot precisely estimate the size of the effects and prevent existing effects from being statistically significant in our analysis. We might thus underestimate the impact of life events. Nevertheless, the diverging results for revealed and stated preferences suggest that perceived preferences and people's behavior when experimentally eliciting preferences potentially respond differently to life events. Consequently, the inference regarding whether and how life events shift preferences may differ between observing the actual behavior of individuals and asking them to subjectively assess their own preferences.

As to the practical implications of our study, we note that, given that we find that divorce and first parenthood may affect risk and time preferences for those who experienced the life event most recently, these life events might be important to consider for financial institutions who give advice or invest on the behalf of clients. In such cases, financial institutions should be aware of when such preferences are measured and that certain life events may temporarily shift preferences.

So far, the evidence on the impact of personal life events on people's risk, time, and social preferences is fragmented, and the results are mixed. It is important to note that relevant life events are not limited to those that we study in this chapter. There are many such events for which we had no or insufficient data, but which could have an equal or even bigger impact: for example, the death of a child or spouse, a serious illness, or a major career change. As we find in our sample that the effects of life events on preferences vary substantially depending on the specific event and the measure that we use, we cannot simply generalize our findings to other life events that might also change preferences. Assessment of the relevance of a broad range of personal life events on risk, time, and social preferences requires further systematic research.

Appendices

3.A Full Regressions

Table 3.A.1: Full Regressions - Preferences and Individual Characteristics

	Risk Preferences			Time Preferences			Social Preferences	
	rCTB	rMPL	GRQ	tCTB	tMPL	GTQ	SG	AQ
Marital Status (=Married)	-0.00	-0.01	-0.20***	-0.07	-0.05	-0.08*	0.05	0.00
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Marital Status (=Widowed)	-0.30*	0.05	-0.15	0.15	0.05	0.18	0.02	-0.18
	(0.12)	(0.10)	(0.15)	(0.17)	(0.12)	(0.15)	(0.18)	(0.13)
Marital Status (=Divorced)	0.11	0.00	0.08	-0.04	-0.04	0.09	0.01	-0.04
	(0.07)	(0.03)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)
Parenthood (=Yes)	0.06	0.04	0.15***	-0.01	-0.02	0.04	-0.04	-0.03
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Sex (=Female)	-0.22***	-0.12***	-0.34***	0.06	0.05	-0.12***	0.04	0.29***
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.02	-0.02**	-0.05***	0.00	-0.00	-0.02***	0.01***	0.01***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age Squared	0.00	0.00**	0.00***					
	(0.00)	(0.00)	(0.00)					
Migration Background (=Native)	0.03	0.01	0.03	0.21***	0.11**	-0.02	0.03	-0.09
	(0.04)	(0.02)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)
Occupation Status (=Self-Employed)	0.08*	0.04*	0.35***	-0.09**	-0.07*	0.18***	0.07	0.04
	(0.04)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Occupation Status (=Other)	-0.01	-0.01	0.13*	-0.14*	-0.05	0.08	0.02	0.02
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Education Level (=Low)	0.04	-0.05	0.02	-0.00	0.03	-0.07	-0.03	-0.28**
	(0.08)	(0.04)	(0.07)	(0.08)	(0.07)	(0.08)	(0.09)	(0.09)
Education Level (=High)	0.04	0.02	-0.02	0.08*	0.18***	0.14***	0.05	0.17***
	(0.04)	(0.02)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
Education Level (=Unknown)	0.06	0.00	0.01	-0.02	0.05	-0.01	0.06	0.00
	(0.05)	(0.02)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Household Wealth (Quintile=2)	0.09	0.03	-0.07	0.09	0.14**	0.08	0.05	-0.05
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=3)	0.06	-0.05	-0.10*	0.05	0.13**	0.06	-0.07	-0.06
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=4)	0.06	-0.03	-0.20***	0.07	0.24***	0.10	-0.06	-0.03
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=5)	0.05	-0.01	-0.06	0.10	0.31***	0.25***	-0.11	-0.07
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Household Income (Quintile=2)	0.00	0.01	0.03	0.07	-0.02	-0.03	0.05	-0.09
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=3)	0.02	0.03	0.08	0.01	-0.03	0.01	0.07	0.01
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=4)	0.09	0.07**	0.19***	0.11*	-0.04	0.02	0.06	0.07
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=5)	0.13*	0.12***	0.23***	0.08	-0.10*	0.03	0.06	0.17**
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Cognitive Reflection	0.01	0.03***	-0.07***	0.09***	0.09***	0.07***	-0.00	0.03*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial Literacy	0.02	0.02*	0.08***	0.02	0.02	0.10***	-0.02	0.02
	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
CTB Instructions Grade	0.01			0.03*				
	(0.01)			(0.01)				
CTB Confidence Grade	-0.07***			-0.01				
	(0.01)			(0.01)				
CTB Dominated Choice	0.42***			-0.16**				
	(0.05)			(0.06)				
MPL Risk Instructions Grade		-0.01*						
		(0.01)						
MPL Risk Confidence Grade		-0.01*						
		(0.01)						
MPL Risk Inconsistent Switching		0.20***						
		(0.02)						
MPL Risk Dominated Choice		-0.43***						
		(0.04)						
MPL Time Instructions Grade					-0.01			
					(0.01)			
MPL Time Confidence Grade					0.07***			
					(0.01)			
MPL Time Inconsistent Switching					0.15**			
					(0.05)			
SG Instructions Grade							-0.01	
							(0.01)	
SG Confidence Grade							0.04***	
							(0.01)	
Constant	0.45	-0.13	1.11***	-0.58***	-0.40**	0.47***	-0.67***	-0.60***
	(0.26)	(0.14)	(0.23)	(0.13)	(0.12)	(0.09)	(0.13)	(0.10)
Observations	4271	4269	4276	4271	4271	4276	4276	4276
Adjusted R^2	0.042	0.080	0.091	0.034	0.057	0.125	0.014	0.045

Notes: Robust standard errors in parentheses. Baselevels: Marital Status (=Single), Parenthood (=No), Sex (=Male), Migration Background (=Non-Native), Occupation Status (=Employee), Education Level (=Middle), Household Wealth (Quintile=1), Household Income (Quintile=1). Age squared is added to the regressions for risk preferences as the data suggests that there is a nonlinear relationship between age and risk preferences. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.A.2: Full Regressions - Marriage and Preferences

	Risk Preferences			Time Preferences			Social Preferences	
	rCTB	rMPL	GRQ	tCTB	tMPL	GTQ	SG	AQ
Married in 2019	0.04	0.10	0.10	0.11	0.15	0.13	0.28*	0.08
	(0.14)	(0.07)	(0.12)	(0.14)	(0.12)	(0.09)	(0.13)	(0.12)
Married in 2018	0.02	0.04	0.14	-0.04	0.06	-0.09	-0.17	-0.11
	(0.10)	(0.05)	(0.11)	(0.12)	(0.10)	(0.10)	(0.12)	(0.12)
Married in 2017	0.04	0.01	-0.02	0.20	0.09	0.02	0.06	-0.13
	(0.11)	(0.05)	(0.10)	(0.11)	(0.10)	(0.10)	(0.12)	(0.11)
Marital Status (=Married)	-0.01	-0.02	-0.21***	-0.09*	-0.07	-0.09*	0.04	0.01
	(0.05)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Marital Status (=Widowed)	-0.30*	0.04	-0.16	0.13	0.03	0.17	0.02	-0.17
	(0.12)	(0.10)	(0.15)	(0.17)	(0.12)	(0.15)	(0.18)	(0.13)
Marital Status (=Divorced)	0.10	-0.00	0.07	-0.05	-0.05	0.08	0.01	-0.04
	(0.07)	(0.04)	(0.06)	(0.07)	(0.06)	(0.06)	(0.07)	(0.06)
Parenthood (=Yes)	0.06	0.04	0.15***	-0.01	-0.02	0.04	-0.03	-0.03
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Sex (=Female)	-0.22***	-0.11***	-0.34***	0.06	0.05	-0.12***	0.04	0.29***
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.02	-0.02**	-0.05***	0.00	-0.00	-0.02***	0.01***	0.01***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age Squared	0.00	0.00*	0.00***					
	(0.00)	(0.00)	(0.00)					
Migration Background (=Native)	0.03	0.01	0.04	0.21***	0.11**	-0.02	0.02	-0.09
	(0.04)	(0.02)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)
Occupation Status (=Self-Employed)	0.08*	0.04*	0.35***	-0.09**	-0.07*	0.18***	0.07	0.04
	(0.04)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Occupation Status (=Other)	-0.01	-0.01	0.13*	-0.14*	-0.05	0.08	0.02	0.02
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Education Level (=Low)	0.04	-0.05	0.01	-0.00	0.03	-0.07	-0.03	-0.28**
	(0.08)	(0.04)	(0.07)	(0.08)	(0.07)	(0.08)	(0.09)	(0.09)
Education Level (=High)	0.04	0.02	-0.02	0.08*	0.18***	0.14***	0.05	0.16***
	(0.04)	(0.02)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
Education Level (=Unknown)	0.06	0.00	0.01	-0.02	0.05	-0.01	0.06	0.00
	(0.05)	(0.02)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Household Wealth (Quintile=2)	0.09	0.03	-0.07	0.09	0.14**	0.08	0.05	-0.05
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=3)	0.07	-0.05	-0.10*	0.05	0.14**	0.06	-0.07	-0.06
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=4)	0.06	-0.02	-0.20***	0.08	0.24***	0.10	-0.06	-0.03
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=5)	0.06	-0.01	-0.06	0.10	0.31***	0.25***	-0.10	-0.07
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Household Income (Quintile=2)	0.00	0.02	0.03	0.07	-0.02	-0.03	0.05	-0.09
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=3)	0.02	0.03	0.08	0.01	-0.03	0.01	0.07	0.01
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=4)	0.09	0.08**	0.19***	0.11*	-0.04	0.02	0.06	0.07
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=5)	0.13*	0.12***	0.23***	0.08	-0.10*	0.02	0.05	0.17**
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Cognitive Reflection	0.01	0.03***	-0.07***	0.09***	0.09***	0.07***	-0.00	0.03*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial Literacy	0.02	0.02*	0.08***	0.02	0.02	0.10***	-0.02	0.02
	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
CTB Instructions Grade	0.01			0.03*				
	(0.01)			(0.01)				
CTB Confidence Grade	-0.07***			-0.01				
	(0.01)			(0.01)				
CTB Dominated Choice	0.42***			-0.16**				
	(0.05)			(0.06)				
MPL Risk Instructions Grade		-0.01*						
		(0.01)						
MPL Risk Confidence Grade		-0.01*						
		(0.01)						
MPL Risk Inconsistent Switching		0.20***						
		(0.02)						
MPL Risk Dominated Choice		-0.44***						
		(0.04)						
MPL Time Instructions Grade					-0.01			
					(0.01)			
MPL Time Confidence Grade					0.07***			
					(0.01)			
MPL Time Inconsistent Switching					0.15**			
					(0.05)			
SG Instructions Grade							-0.01	
							(0.01)	
SG Confidence Grade							0.04***	
							(0.01)	
Constant	0.44	-0.15	1.07***	-0.60***	-0.42***	0.47***	-0.67***	-0.59***
	(0.26)	(0.14)	(0.23)	(0.13)	(0.12)	(0.09)	(0.13)	(0.10)
Observations	4271	4269	4276	4271	4271	4276	4276	4276
Adjusted R^2	0.042	0.080	0.090	0.034	0.057	0.125	0.015	0.045

Notes: Robust standard errors in parentheses. Baselevels: Marital Status (=Single), Parenthood (=No), Sex (=Male), Migration Background (=Non-Native), Occupation Status (=Employee), Education Level (=Middle), Household Wealth (Quintile=1), Household Income (Quintile=1). Age squared is added to the regressions for risk preferences as the data suggests that there is a nonlinear relationship between age and risk preferences. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.A.3: Full Regressions - Divorce and Preferences

	Risk Preferences			Time Preferences			Social Preferences	
	rCTB	rMPL	GRQ	tCTB	tMPL	GTQ	SG	AQ
Divorced in 2019	-0.30	-0.35***	0.05	0.04	-0.25	0.31*	0.23	-0.07
	(0.17)	(0.10)	(0.21)	(0.20)	(0.17)	(0.14)	(0.19)	(0.24)
Divorced in 2018	-0.14	-0.23*	-0.22	0.04	-0.19	0.25	-0.03	-0.04
	(0.18)	(0.11)	(0.21)	(0.19)	(0.22)	(0.20)	(0.23)	(0.25)
Divorced in 2017	-0.12	-0.00	-0.14	-0.13	0.01	-0.10	0.10	-0.10
	(0.22)	(0.09)	(0.21)	(0.23)	(0.18)	(0.19)	(0.21)	(0.23)
Marital Status (=Married)	-0.00	-0.01	-0.20***	-0.07	-0.05	-0.08*	0.05	0.00
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Marital Status (=Widowed)	-0.29*	0.05	-0.15	0.15	0.05	0.18	0.02	-0.18
	(0.12)	(0.10)	(0.15)	(0.17)	(0.12)	(0.15)	(0.18)	(0.13)
Marital Status (=Divorced)	0.14	0.04	0.10	-0.04	-0.02	0.06	-0.01	-0.03
	(0.08)	(0.04)	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)
Parenthood (=Yes)	0.06	0.04	0.15***	-0.01	-0.02	0.03	-0.04	-0.03
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Sex (=Female)	-0.22***	-0.12***	-0.34***	0.06	0.05	-0.12***	0.04	0.29***
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.02	-0.02**	-0.05***	0.00	-0.00	-0.02***	0.01***	0.01***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age Squared	0.00	0.00*	0.00***					
	(0.00)	(0.00)	(0.00)					
Migration Background (=Native)	0.04	0.02	0.03	0.21***	0.11**	-0.02	0.03	-0.09
	(0.04)	(0.02)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)
Occupation Status (=Self-Employed)	0.08*	0.04*	0.35***	-0.09**	-0.07*	0.18***	0.07*	0.04
	(0.04)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Occupation Status (=Other)	-0.00	-0.01	0.13*	-0.14*	-0.05	0.08	0.02	0.02
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Education Level (=Low)	0.04	-0.05	0.02	-0.00	0.03	-0.06	-0.03	-0.28**
	(0.08)	(0.04)	(0.08)	(0.08)	(0.07)	(0.08)	(0.09)	(0.09)
Education Level (=High)	0.04	0.02	-0.02	0.08*	0.18***	0.14***	0.05	0.17***
	(0.04)	(0.02)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
Education Level (=Unknown)	0.06	0.00	0.01	-0.02	0.05	-0.01	0.06	0.00
	(0.05)	(0.02)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Household Wealth (Quintile=2)	0.09	0.03	-0.07	0.09	0.14**	0.08	0.05	-0.05
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=3)	0.07	-0.05	-0.10*	0.05	0.14**	0.06	-0.08	-0.06
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=4)	0.06	-0.02	-0.20***	0.07	0.24***	0.10	-0.07	-0.03
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=5)	0.06	-0.01	-0.06	0.10	0.31***	0.25***	-0.11	-0.07
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Household Income (Quintile=2)	0.00	0.02	0.03	0.07	-0.02	-0.03	0.05	-0.09
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=3)	0.02	0.03	0.08	0.01	-0.03	0.01	0.07	0.01
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=4)	0.09	0.07**	0.19***	0.11*	-0.04	0.02	0.06	0.07
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=5)	0.13*	0.12***	0.23***	0.08	-0.10*	0.03	0.06	0.17**
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Cognitive Reflection	0.01	0.03**	-0.07***	0.09***	0.09***	0.07***	-0.00	0.03*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial Literacy	0.02	0.02*	0.08***	0.02	0.02	0.10***	-0.02	0.02
	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
CTB Instructions Grade	0.01			0.03*				
	(0.01)			(0.01)				
CTB Confidence Grade	-0.07***			-0.01				
	(0.01)			(0.01)				
CTB Dominated Choice	0.43***			-0.16**				
	(0.05)			(0.06)				
MPL Risk Instructions Grade		-0.01*						
		(0.01)						
MPL Risk Confidence Grade		-0.01*						
		(0.01)						
MPL Risk Inconsistent Switching		0.20***						
		(0.02)						
MPL Risk Dominated Choice		-0.44***						
		(0.04)						
MPL Time Instructions Grade					-0.01			
					(0.01)			
MPL Time Confidence Grade					0.07***			
					(0.01)			
MPL Time Inconsistent Switching					0.16**			
					(0.05)			
SG Instructions Grade							-0.01	
							(0.01)	
SG Confidence Grade							0.04***	
							(0.01)	
Constant	0.44	-0.15	1.10***	-0.58***	-0.40**	0.47***	-0.67***	-0.60***
	(0.26)	(0.14)	(0.23)	(0.13)	(0.12)	(0.09)	(0.13)	(0.10)
Observations	4271	4269	4276	4271	4271	4276	4276	4276
Adjusted R^2	0.042	0.082	0.090	0.034	0.057	0.125	0.014	0.045

Notes: Robust standard errors in parentheses. Baselevels: Marital Status (=Single), Parenthood (=No), Sex (=Male), Migration Background (=Non-Native), Occupation Status (=Employee), Education Level (=Middle), Household Wealth (Quintile=1), Household Income (Quintile=1). Age squared is added to the regressions for risk preferences as the data suggests that there is a nonlinear relationship between age and risk preferences. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.A.4: Full Regressions - First Parenthood and Preferences

	Risk Preferences			Time Preferences			Social Preferences	
	rCTB	rMPL	GRQ	tCTB	tMPL	GTQ	SG	AQ
First Parenthood in 2019	0.11	0.17**	0.04	0.20	0.15	0.18	-0.17	-0.01
	(0.13)	(0.06)	(0.12)	(0.13)	(0.12)	(0.10)	(0.12)	(0.12)
First Parenthood in 2018	0.12	0.05	0.04	0.12	0.10	0.03	-0.22	0.05
	(0.12)	(0.06)	(0.12)	(0.14)	(0.12)	(0.13)	(0.13)	(0.14)
First Parenthood in 2017	0.26	0.07	0.26	0.12	-0.04	-0.20	0.11	-0.09
	(0.18)	(0.06)	(0.14)	(0.13)	(0.11)	(0.15)	(0.15)	(0.16)
Marital Status (=Married)	-0.00	-0.01	-0.20***	-0.07	-0.05	-0.08*	0.05	0.00
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Marital Status (=Widowed)	-0.30*	0.05	-0.15	0.14	0.04	0.18	0.03	-0.18
	(0.12)	(0.10)	(0.15)	(0.17)	(0.12)	(0.15)	(0.18)	(0.13)
Marital Status (=Divorced)	0.11	0.01	0.08	-0.04	-0.04	0.09	0.01	-0.04
	(0.07)	(0.03)	(0.06)	(0.07)	(0.06)	(0.06)	(0.06)	(0.06)
Parenthood (=Yes)	0.04	0.02	0.14**	-0.03	-0.03	0.03	-0.02	-0.03
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Sex (=Female)	-0.22***	-0.11***	-0.34***	0.06	0.05	-0.12***	0.04	0.29***
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.01	-0.02**	-0.05***	0.00	-0.00	-0.02***	0.01***	0.01***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age Squared	0.00	0.00*	0.00***					
	(0.00)	(0.00)	(0.00)					
Migration Background (=Native)	0.03	0.01	0.03	0.21***	0.11**	-0.02	0.03	-0.09
	(0.04)	(0.02)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)
Occupation Status (=Self-Employed)	0.08*	0.04*	0.35***	-0.09**	-0.07*	0.18***	0.06	0.04
	(0.04)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Occupation Status (=Other)	-0.01	-0.01	0.13*	-0.14*	-0.06	0.08	0.02	0.02
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Education Level (=Low)	0.04	-0.05	0.02	-0.00	0.03	-0.06	-0.03	-0.28**
	(0.08)	(0.04)	(0.08)	(0.08)	(0.07)	(0.08)	(0.09)	(0.09)
Education Level (=High)	0.04	0.02	-0.02	0.08*	0.18***	0.14***	0.05	0.17***
	(0.04)	(0.02)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
Education Level (=Unknown)	0.06	0.01	0.01	-0.01	0.05	-0.01	0.06	0.00
	(0.05)	(0.02)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Household Wealth (Quintile=2)	0.08	0.03	-0.07	0.09	0.14**	0.08	0.05	-0.05
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=3)	0.06	-0.05	-0.10*	0.05	0.13**	0.06	-0.07	-0.06
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=4)	0.06	-0.03	-0.20***	0.07	0.24***	0.10	-0.06	-0.03
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=5)	0.06	-0.01	-0.06	0.10	0.31***	0.25***	-0.11	-0.07
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Household Income (Quintile=2)	0.00	0.02	0.03	0.07	-0.02	-0.03	0.05	-0.09
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=3)	0.02	0.03	0.08	0.01	-0.03	0.01	0.07	0.01
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=4)	0.09	0.07**	0.19***	0.11*	-0.04	0.03	0.06	0.07
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=5)	0.13*	0.12***	0.23***	0.08	-0.10*	0.03	0.05	0.17**
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Cognitive Reflection	0.01	0.03***	-0.07***	0.09***	0.09***	0.07***	-0.00	0.03*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial Literacy	0.02	0.02*	0.08***	0.02	0.02	0.10***	-0.02	0.02
	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
CTB Instructions Grade	0.01			0.03*				
	(0.01)			(0.01)				
CTB Confidence Grade	-0.07***			-0.01				
	(0.01)			(0.01)				
CTB Dominated Choice	0.42***			-0.16**				
	(0.05)			(0.06)				
MPL Risk Instructions Grade		-0.01*						
		(0.01)						
MPL Risk Confidence Grade		-0.01*						
		(0.01)						
MPL Risk Inconsistent Switching		0.20***						
		(0.02)						
MPL Risk Dominated Choice		-0.43***						
		(0.04)						
MPL Time Instructions Grade					-0.01			
					(0.01)			
MPL Time Confidence Grade					0.07***			
					(0.01)			
MPL Time Inconsistent Switching					0.15**			
					(0.05)			
SG Instructions Grade							-0.01	
							(0.01)	
SG Confidence Grade							0.04***	
							(0.01)	
Constant	0.39	-0.18	1.07***	-0.61***	-0.41***	0.46***	-0.64***	-0.60***
	(0.26)	(0.14)	(0.23)	(0.13)	(0.13)	(0.09)	(0.13)	(0.10)
Observations	4271	4269	4276	4271	4271	4276	4276	4276
Adjusted R^2	0.042	0.081	0.091	0.034	0.057	0.125	0.015	0.045

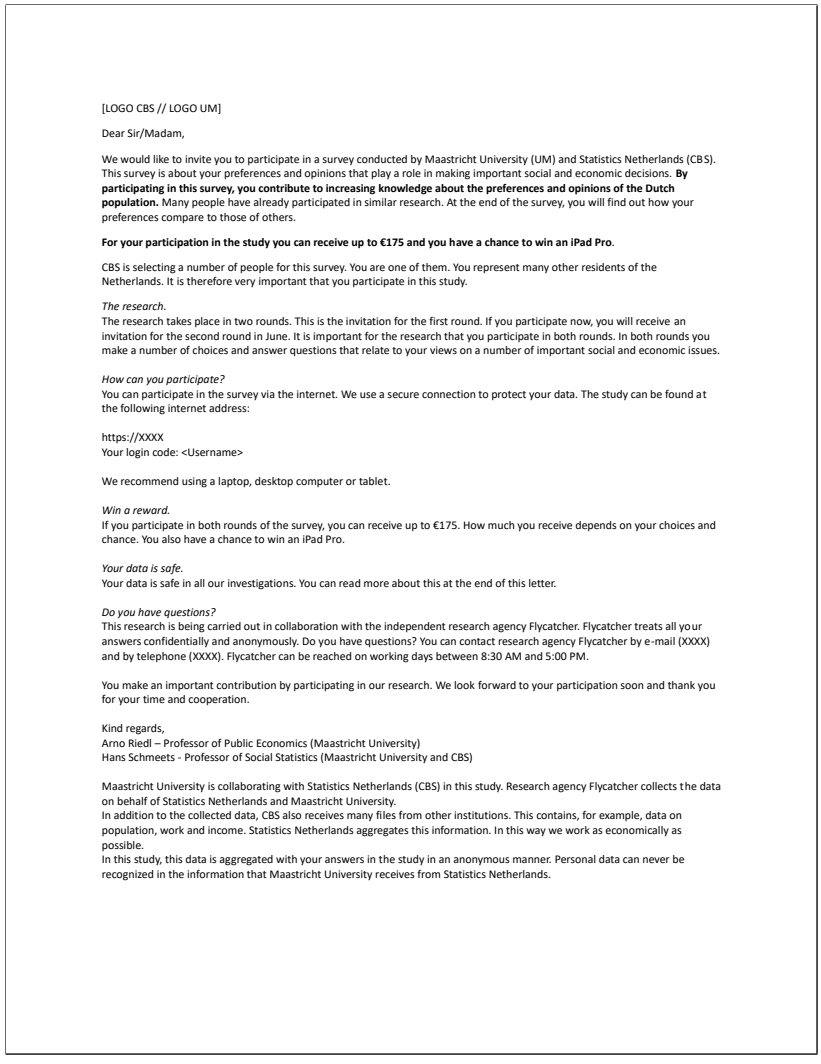
Notes: Robust standard errors in parentheses. Baselevels: Marital Status (=Single), Parenthood (=No), Sex (=Male), Migration Background (=Non-Native), Occupation Status (=Employee), Education Level (=Middle), Household Wealth (Quintile=1), Household Income (Quintile=1). Age squared is added to the regressions for risk preferences as the data suggests that there is a nonlinear relationship between age and risk preferences. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 3.A.5: Full Regressions - Life Events and Preferences

	Risk Preferences			Time Preferences			Social Preferences	
	rCTB	rMPL	GRQ	tCTB	tMPL	GTQ	SG	AQ
Married in 2019	0.03	0.09	0.10	0.09	0.13	0.11	0.30*	0.08
	(0.14)	(0.07)	(0.12)	(0.14)	(0.12)	(0.09)	(0.13)	(0.12)
Married in 2018	-0.02	0.01	0.12	-0.08	0.04	-0.10	-0.14	-0.11
	(0.10)	(0.05)	(0.11)	(0.12)	(0.10)	(0.11)	(0.12)	(0.12)
Married in 2017	0.02	-0.01	-0.03	0.17	0.07	-0.00	0.09	-0.13
	(0.12)	(0.05)	(0.10)	(0.11)	(0.10)	(0.11)	(0.12)	(0.11)
Divorced in 2019	-0.29	-0.34**	0.05	0.04	-0.25	0.31*	0.22	-0.06
	(0.17)	(0.10)	(0.21)	(0.20)	(0.18)	(0.14)	(0.19)	(0.24)
Divorced in 2018	-0.14	-0.22*	-0.22	0.04	-0.18	0.25	-0.04	-0.04
	(0.18)	(0.11)	(0.21)	(0.19)	(0.21)	(0.20)	(0.23)	(0.25)
Divorced in 2017	-0.12	-0.00	-0.15	-0.12	0.02	-0.09	0.11	-0.10
	(0.22)	(0.09)	(0.21)	(0.22)	(0.18)	(0.19)	(0.21)	(0.24)
First Parenthood in 2019	0.11	0.16**	0.01	0.18	0.12	0.19	-0.19	0.02
	(0.13)	(0.06)	(0.12)	(0.13)	(0.12)	(0.10)	(0.12)	(0.12)
First Parenthood in 2018	0.12	0.05	0.02	0.12	0.08	0.05	-0.20	0.07
	(0.12)	(0.07)	(0.12)	(0.14)	(0.12)	(0.13)	(0.13)	(0.14)
First Parenthood in 2017	0.26	0.07	0.25	0.12	-0.05	-0.18	0.14	-0.06
	(0.19)	(0.06)	(0.14)	(0.13)	(0.12)	(0.15)	(0.15)	(0.16)
Marital Status (=Married)	-0.00	-0.02	-0.21***	-0.08	-0.07	-0.08	0.04	0.01
	(0.05)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Marital Status (=Widowed)	-0.30*	0.04	-0.16	0.14	0.03	0.17	0.01	-0.17
	(0.12)	(0.10)	(0.15)	(0.17)	(0.12)	(0.15)	(0.18)	(0.13)
Marital Status (=Divorced)	0.15	0.04	0.10	-0.04	-0.02	0.06	-0.02	-0.02
	(0.08)	(0.04)	(0.07)	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)
Parenthood (=Yes)	0.04	0.03	0.14***	-0.03	-0.02	0.03	-0.02	-0.03
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Sex (=Female)	-0.22***	-0.12***	-0.34***	0.06*	0.05	-0.11***	0.04	0.29***
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.01	-0.02**	-0.05***	0.00	-0.00	-0.02***	0.01***	0.01***
	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Age Squared	0.00	0.00*	0.00***					
	(0.00)	(0.00)	(0.00)					
Migration Background (=Native)	0.04	0.02	0.03	0.21***	0.11**	-0.02	0.02	-0.09
	(0.04)	(0.02)	(0.04)	(0.05)	(0.04)	(0.05)	(0.04)	(0.05)
Occupation Status (=Self-Employed)	0.08*	0.04*	0.34***	-0.09**	-0.07*	0.18***	0.06	0.04
	(0.04)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Occupation Status (=Other)	-0.01	-0.01	0.13*	-0.14*	-0.05	0.08	0.03	0.02
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Education Level (=Low)	0.04	-0.05	0.01	-0.00	0.03	-0.06	-0.03	-0.28**
	(0.08)	(0.04)	(0.08)	(0.08)	(0.07)	(0.08)	(0.09)	(0.09)
Education Level (=High)	0.04	0.02	-0.02	0.08*	0.18***	0.14***	0.05	0.16***
	(0.04)	(0.02)	(0.04)	(0.04)	(0.03)	(0.04)	(0.04)	(0.04)
Education Level (=Unknown)	0.06	0.01	0.01	-0.02	0.05	-0.01	0.06	0.00
	(0.05)	(0.02)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Household Wealth (Quintile=2)	0.08	0.03	-0.07	0.09	0.14**	0.08	0.05	-0.05
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=3)	0.07	-0.05	-0.10*	0.05	0.14**	0.06	-0.07	-0.06
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=4)	0.06	-0.02	-0.20***	0.08	0.24***	0.10	-0.06	-0.03
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=5)	0.06	-0.01	-0.06	0.10	0.31***	0.25***	-0.10	-0.07
	(0.06)	(0.03)	(0.06)	(0.06)	(0.05)	(0.06)	(0.06)	(0.06)
Household Income (Quintile=2)	0.00	0.02	0.03	0.07	-0.02	-0.03	0.05	-0.09
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=3)	0.02	0.03	0.08	0.01	-0.03	0.01	0.07	0.01
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=4)	0.09	0.08**	0.19***	0.11*	-0.04	0.03	0.06	0.07
	(0.05)	(0.03)	(0.05)	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=5)	0.13*	0.12***	0.23***	0.08	-0.10*	0.03	0.05	0.17**
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Cognitive Reflection	0.01	0.03**	-0.07***	0.09***	0.09***	0.07***	-0.00	0.03*
	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Financial Literacy	0.02	0.02*	0.08***	0.02	0.02	0.10***	-0.02	0.02
	(0.02)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)
CTB Instructions Grade	0.01			0.03*				
	(0.01)			(0.01)				
CTB Confidence Grade	-0.07***			-0.01				
	(0.01)			(0.01)				
CTB Dominated Choice	0.43***			-0.16**				
	(0.05)			(0.06)				
MPL Risk Instructions Grade		-0.01						
		(0.01)						
MPL Risk Confidence Grade		-0.01*						
		(0.01)						
MPL Risk Inconsistent Switching		0.20***						
		(0.02)						
MPL Risk Dominated Choice		-0.44***						
		(0.04)						
MPL Time Instructions Grade					-0.01			
					(0.01)			
MPL Time Confidence Grade					0.07***			
					(0.01)			
MPL Time Inconsistent Switching					0.16**			
					(0.05)			
SG Instructions Grade							-0.01	
							(0.01)	
SG Confidence Grade							0.04***	
							(0.01)	
Constant	0.38	-0.20	1.04***	-0.62***	-0.43***	0.46***	-0.65***	-0.59***
	(0.26)	(0.15)	(0.23)	(0.13)	(0.13)	(0.09)	(0.13)	(0.10)
Observations	4271	4269	4276	4271	4271	4276	4276	4276
Adjusted R^2	0.042	0.083	0.090	0.034	0.057	0.125	0.015	0.044

Notes: Robust standard errors in parentheses. Baselevels: Marital Status (=Single), Parenthood (=No), Sex (=Male), Migration Background (=Non-Native), Occupation Status (=Employee), Education Level (=Middle), Household Wealth (Quintile=1), Household Income (Quintile=1). Age squared is added to the regressions for risk preferences as the data suggests that there is a nonlinear relationship between age and risk preferences. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

3.B Invitation Letters and Welcome Screens



[LOGO CBS // LOGO UM]

Dear Sir/Madam,

We would like to invite you to participate in a survey conducted by Maastricht University (UM) and Statistics Netherlands (CBS). This survey is about your preferences and opinions that play a role in making important social and economic decisions. **By participating in this survey, you contribute to increasing knowledge about the preferences and opinions of the Dutch population.** Many people have already participated in similar research. At the end of the survey, you will find out how your preferences compare to those of others.

For your participation in the study you can receive up to €175 and you have a chance to win an iPad Pro.

CBS is selecting a number of people for this survey. You are one of them. You represent many other residents of the Netherlands. It is therefore very important that you participate in this study.

The research.
The research takes place in two rounds. This is the invitation for the first round. If you participate now, you will receive an invitation for the second round in June. It is important for the research that you participate in both rounds. In both rounds you make a number of choices and answer questions that relate to your views on a number of important social and economic issues.

How can you participate?
You can participate in the survey via the internet. We use a secure connection to protect your data. The study can be found at the following internet address:

https://XXXX
Your login code: <Username>

We recommend using a laptop, desktop computer or tablet.

Win a reward.
If you participate in both rounds of the survey, you can receive up to €175. How much you receive depends on your choices and chance. You also have a chance to win an iPad Pro.

Your data is safe.
Your data is safe in all our investigations. You can read more about this at the end of this letter.

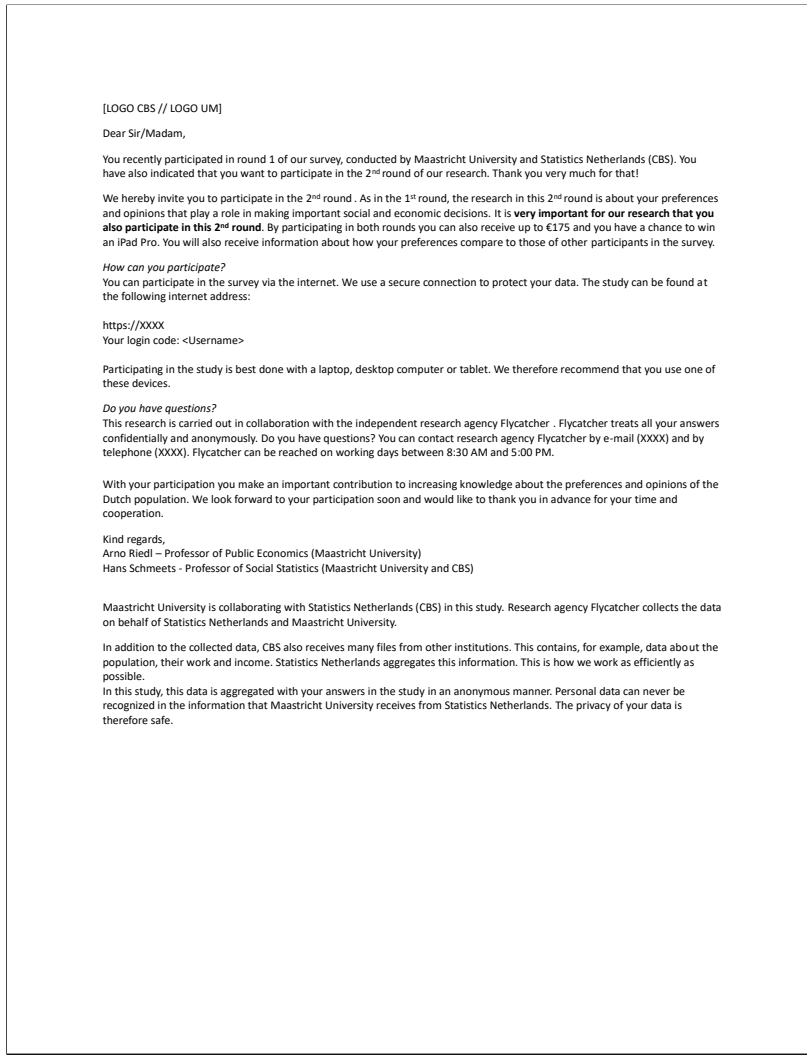
Do you have questions?
This research is being carried out in collaboration with the independent research agency Flycatcher. Flycatcher treats all your answers confidentially and anonymously. Do you have questions? You can contact research agency Flycatcher by e-mail (XXXX) and by telephone (XXXX). Flycatcher can be reached on working days between 8:30 AM and 5:00 PM.

You make an important contribution by participating in our research. We look forward to your participation soon and thank you for your time and cooperation.

Kind regards,
Arno Riedl – Professor of Public Economics (Maastricht University)
Hans Schmeets - Professor of Social Statistics (Maastricht University and CBS)

Maastricht University is collaborating with Statistics Netherlands (CBS) in this study. Research agency Flycatcher collects the data on behalf of Statistics Netherlands and Maastricht University.
In addition to the collected data, CBS also receives many files from other institutions. This contains, for example, data on population, work and income. Statistics Netherlands aggregates this information. In this way we work as economically as possible.
In this study, this data is aggregated with your answers in the study in an anonymous manner. Personal data can never be recognized in the information that Maastricht University receives from Statistics Netherlands.

Figure 3.B.1: Invitation Letter Wave 1 (Translated from Dutch)



[LOGO CBS // LOGO UM]

Dear Sir/Madam,

You recently participated in round 1 of our survey, conducted by Maastricht University and Statistics Netherlands (CBS). You have also indicated that you want to participate in the 2nd round of our research. Thank you very much for that!

We hereby invite you to participate in the 2nd round . As in the 1st round, the research in this 2nd round is about your preferences and opinions that play a role in making important social and economic decisions. It is **very important for our research that you also participate in this 2nd round**. By participating in both rounds you can also receive up to €175 and you have a chance to win an iPad Pro. You will also receive information about how your preferences compare to those of other participants in the survey.

How can you participate?
You can participate in the survey via the internet. We use a secure connection to protect your data. The study can be found at the following internet address:

https://XXXX
Your login code: <Username>

Participating in the study is best done with a laptop, desktop computer or tablet. We therefore recommend that you use one of these devices.

Do you have questions?
This research is carried out in collaboration with the independent research agency Flycatcher . Flycatcher treats all your answers confidentially and anonymously. Do you have questions? You can contact research agency Flycatcher by e-mail (XXXX) and by telephone (XXXX). Flycatcher can be reached on working days between 8:30 AM and 5:00 PM.

With your participation you make an important contribution to increasing knowledge about the preferences and opinions of the Dutch population. We look forward to your participation soon and would like to thank you in advance for your time and cooperation.

Kind regards,
Arno Riedl – Professor of Public Economics (Maastricht University)
Hans Schmeets - Professor of Social Statistics (Maastricht University and CBS)

Maastricht University is collaborating with Statistics Netherlands (CBS) in this study. Research agency Flycatcher collects the data on behalf of Statistics Netherlands and Maastricht University.

In addition to the collected data, CBS also receives many files from other institutions. This contains, for example, data about the population, their work and income. Statistics Netherlands aggregates this information. This is how we work as efficiently as possible.
In this study, this data is aggregated with your answers in the study in an anonymous manner. Personal data can never be recognized in the information that Maastricht University receives from Statistics Netherlands. The privacy of your data is therefore safe.

Figure 3.B.2: Invitation Letter Wave 2 (Translated from Dutch)

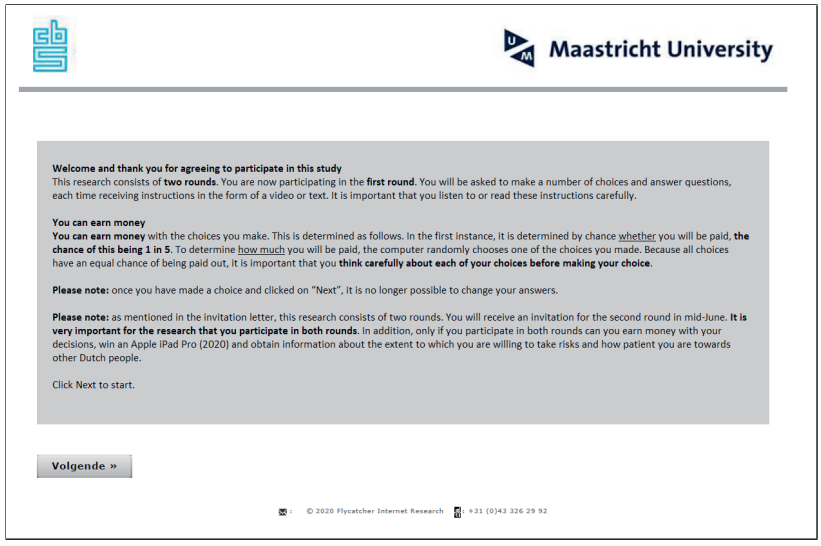


Figure 3.B.3: Welcome Screen Wave 1 (Translated from Dutch)

Figure 3.B.4: Welcome Screen Wave 2 (Translated from Dutch)

3.C Experimental Design

Convex Time Budget. We implemented two sets of the CTB, in total participants made 24 decisions. The parameters were identical in both sets, except that the late payout took place after 16 weeks in the first set and after 24 weeks in the second set. Table 3.C.1 summarizes the parameters that were used.

Table 3.C.1: CTB Parameters Set 1

Task	t	k	a_t	a_{t+k}	p_{t+k}	EV(a_{t+k})	1+r	1+r′
#1	8	16	€75	€75.00	1	€75.00	1.00	1.00
#2	8	16	€75	€79.50	1	€79.50	1.06	1.06
#3	8	16	€75	€93.00	1	€93.00	1.24	1.24
#4	8	16	€75	€83.40	0.9	€75.00	1.11	1.00
#5	8	16	€75	€88.35	0.9	€79.50	1.18	1.06
#6	8	16	€75	€103.35	0.9	€93.00	1.38	1.24
#7	8	16	€75	€107.10	0.7	€75.00	1.43	1.00
#8	8	16	€75	€113.55	0.7	€79.50	1.51	1.06
#9	8	16	€75	€132.75	0.7	€93.00	1.77	1.24
#10	8	16	€75	€150.00	0.5	€75.00	2.00	1.00
#11	8	16	€75	€159.00	0.5	€79.50	2.12	1.06
#12	8	16	€75	€186.00	0.5	€93.00	2.48	1.24

Notes: Set 2 is identical, except that k=24. t=delay period early date in weeks, k=delay period late date in weeks, a_t=amount available at the early date, a_{t+k}= amount available at the late date, p_{t+k}=probability that the payment at the late date is actually paid out, EV(a_{t+k})=expected value of the amount available at the late date, 1+r=interest rate over the delay period not adjusted for risk, 1+r′= interest rate over the delay period adjusted for risk.

The decision tasks were presented with information on the dates, probabilities, and possible allocations on one screen, using colors for clarity. Figure 3.C.1 shows an example of such a decision screen. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 3.C.2 shows the screen with instructions and Figure 3.C.3 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

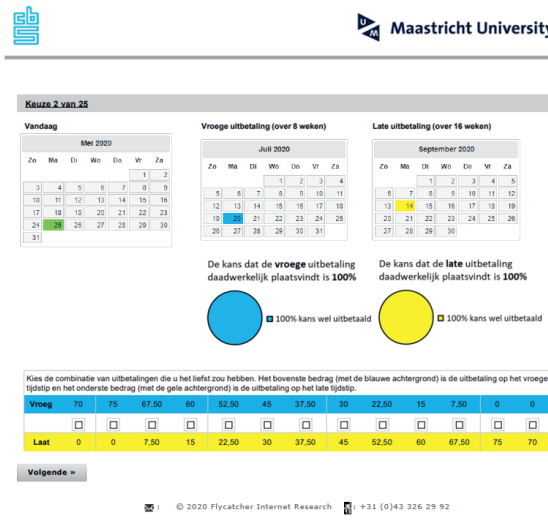


Figure 3.C.1: Example Decision Screen CTB

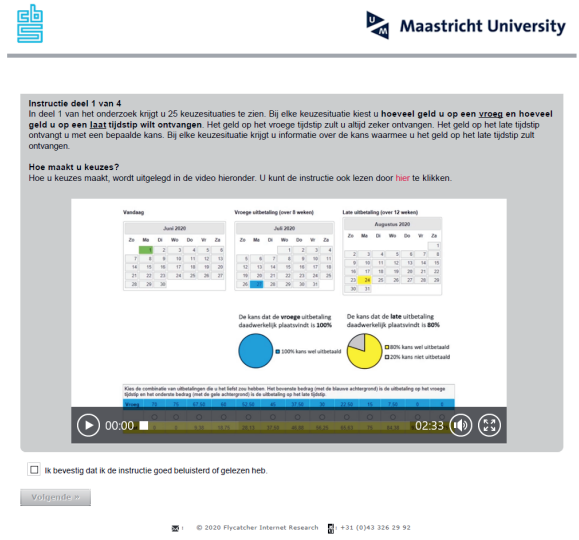


Figure 3.C.2: Instructions Screen CTB

Instructions Part [1/4]
In part 1 of the study, you will be presented with 24 decision situations. In each decision situation, you choose **how much money you want to receive at an "early" and how much money you want to receive at a "late" time**. You will always receive the money at the early time with certainty. You will receive the money at the late time with a certain probability. In each decision situation, you will get information about the probability with which you will receive the money at the late time.

How do you make choices?
How you make choices is explained using the example below. The example shows a decision situation in which you are asked to divide a sum of money between an amount of money at an early time (in this example July 27) and an amount of money at a late time (in this example August 24). The times will be different in the choices you make later.

The calendars indicate times relevant to your choice. Today (June 1 in this example) is highlighted in green. The time of the early payout in each decision situation is exactly 8 weeks from today and is marked in blue. The time of the late payout in this example is 12 weeks from today and is highlighted in yellow. **The time of the late payment may differ between decision situations.**

Below the calendars you will see the probability of actually receiving the money at the late time. In this example, this probability is 80% (i.e. a probability of 8 in 10). **This probability can differ between decision situations.**

At the bottom of the page you can see the possible divisions of the amount of money in this example. The top amount (with the blue background) shows the amount of money you will receive at the early time. The bottom amount (with the yellow background) shows the amount of money you will receive at the late time with a certain probability.

Explanation of payments in this example. Do you choose:

70 ◉ 0 then you would receive **€70** at the early time (27 July) and receive **€0** at the late time (24 August)

30 ◉ 56,63 then you would receive **€30** at the early time (27 July) and receive **€56,63** at the late time (24 August) and is the probability that you receive the money at the late time 80%.

0 ◉ 93,75 then you would receive **€0** at the early time (27 July) and receive **€93,75** at the late time (24 August) and is the probability that you receive the money at the late time 80%.

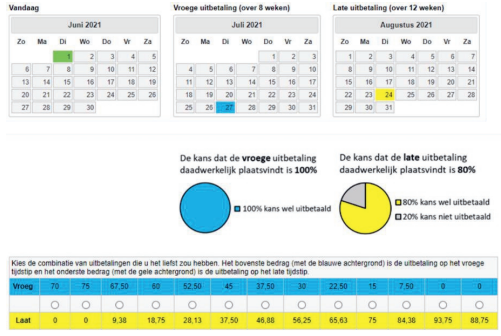


Figure 3.C.3: Written Instructions CTB (Translated from Dutch)

Multiple Price List Time Preferences. Tables 3.C.2 and 3.C.3 show the parameters used for the tMPLs.

Table 3.C.2: MPL-Time List 1

	Option A		Option B	
	€	Delay Period	€	Delay Period
#1	75	8 weeks	75	16 weeks
#2	75	8 weeks	76	16 weeks
#3	75	8 weeks	77	16 weeks
#4	75	8 weeks	79	16 weeks
#5	75	8 weeks	81	16 weeks
#6	75	8 weeks	84	16 weeks
#7	75	8 weeks	87	16 weeks
#8	75	8 weeks	91	16 weeks
#9	75	8 weeks	95	16 weeks

Table 3.C.3: MPL-Time List 2

	Option A		Option B	
	€	Delay Period	€	Delay Period
#1	75	8 weeks	75	24 weeks
#2	75	8 weeks	76	24 weeks
#3	75	8 weeks	77	24 weeks
#4	75	8 weeks	79	24 weeks
#5	75	8 weeks	81	24 weeks
#6	75	8 weeks	84	24 weeks
#7	75	8 weeks	87	24 weeks
#8	75	8 weeks	91	24 weeks
#9	75	8 weeks	95	24 weeks

The decision tasks were presented in a list of binary choices with information about the delay period and outcomes. Figure 3.C.4 shows an example of a tMPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 3.C.5 shows the screen with instructions and Figure 3.C.6 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

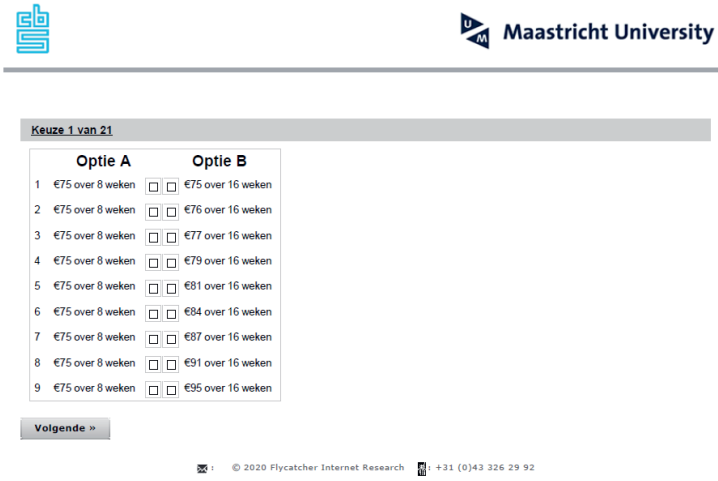


Figure 3.C.4: Example Decision Screen tMPL, Version 1

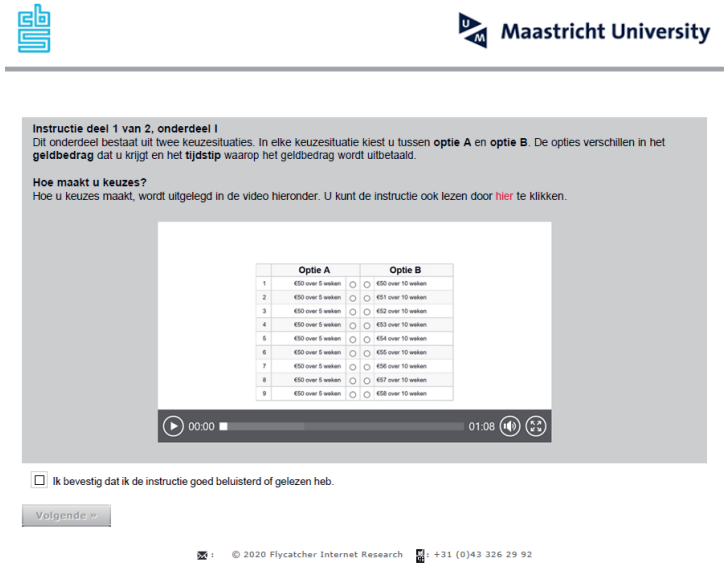


Figure 3.C.5: Instructions Screen tMPL

Instructions part [1.1/2]

This part consists of two decision situations. In each decision situation you choose between **option A** and **option B**. The options **differ** in the **amount of money** you receive and the **time** when the amount of money is paid out.

How do you make choices?

How you make choices is explained using the example below. The example shows a choice situation in which you are asked to make **9 choices** between option A and option B.

Option A is the same in every row. If you choose option A in this example, you will receive **€50**. This amount will be paid **in 5 weeks**.

Option B differs in each row. If you choose option B in this example, you will receive **€50 or more**. This amount will be paid **in 10 weeks**.

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

	Optie A			Optie B
1	€50 over 5 weken	O	O	€50 over 10 weken
2	€50 over 5 weken	O	O	€51 over 10 weken
3	€50 over 5 weken	O	O	€52 over 10 weken
4	€50 over 5 weken	O	O	€53 over 10 weken
5	€50 over 5 weken	O	O	€54 over 10 weken
6	€50 over 5 weken	O	O	€55 over 10 weken
7	€50 over 5 weken	O	O	€56 over 10 weken
8	€50 over 5 weken	O	O	€57 over 10 weken
9	€50 over 5 weken	O	O	€58 over 10 weken

Figure 3.C.6: Written Instructions tMPL

Multiple Price List Risk Preferences. Tables 3.C.4 to 3.C.8 show the parameters used for the rMPLs.

Table 3.C.4: MPL-PGp List 1

	Option A					Option B				
	p	€	p	€	EV(A)	p	€	p	€	EV(B)
#1	0.1	80	0.9	64	€66	0.1	154	0.9	4	€19
#2	0.2	80	0.8	64	€67	0.2	154	0.8	4	€34
#3	0.3	80	0.7	64	€69	0.3	154	0.7	4	€49
#4	0.4	80	0.6	64	€70	0.4	154	0.6	4	€64
#5	0.5	80	0.5	64	€72	0.5	154	0.5	4	€79
#6	0.6	80	0.4	64	€74	0.6	154	0.4	4	€94
#7	0.7	80	0.3	64	€75	0.7	154	0.3	4	€109
#8	0.8	80	0.2	64	€77	0.8	154	0.2	4	€124
#9	0.9	80	0.1	64	€78	0.9	154	0.1	4	€139
#10	1	80	0	64	€80	1	154	0	4	€154

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table 3.C.5: MPL-PGp List 2

	Option A					Option B				
	p	€	p	€	EV(A)	p	€	p	€	EV(B)
#1	0.1	99	0.9	41	€47	0.1	134	0.9	19	€31
#2	0.2	99	0.8	41	€53	0.2	134	0.8	19	€42
#3	0.3	99	0.7	41	€58	0.3	134	0.7	19	€54
#4	0.4	99	0.6	41	€64	0.4	134	0.6	19	€65
#5	0.5	99	0.5	41	€70	0.5	134	0.5	19	€77
#6	0.6	99	0.4	41	€76	0.6	134	0.4	19	€88
#7	0.7	99	0.3	41	€82	0.7	134	0.3	19	€100
#8	0.8	99	0.2	41	€87	0.8	134	0.2	19	€111
#9	0.9	99	0.1	41	€93	0.9	134	0.1	19	€123
#10	1	99	0	41	€99	1	134	0	19	€134

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table 3.C.6: MPL-SGsure List 1

	Option A			Option B				
	p	€	EV(A)	p	€	p	€	EV(B)
#1	1	52	€52	0.5	30	0.5	130	€80
#2	1	57	€57	0.5	30	0.5	130	€80
#3	1	63	€63	0.5	30	0.5	130	€80
#4	1	68	€68	0.5	30	0.5	130	€80
#5	1	73	€73	0.5	30	0.5	130	€80
#6	1	78	€78	0.5	30	0.5	130	€80
#7	1	82	€82	0.5	30	0.5	130	€80
#8	1	88	€88	0.5	30	0.5	130	€80
#9	1	94	€94	0.5	30	0.5	130	€80
#10	1	101	€101	0.5	30	0.5	130	€80

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table 3.C.7: MPL-SGsure List 2

	Option A			Option B				
	p	€	EV(A)	p	€	p	€	EV(B)
#1	1	39	€39	0.33	20	0.67	110	€80
#2	1	46	€46	0.33	20	0.67	110	€80
#3	1	56	€56	0.33	20	0.67	110	€80
#4	1	64	€64	0.33	20	0.67	110	€80
#5	1	70	€70	0.33	20	0.67	110	€80
#6	1	75	€75	0.33	20	0.67	110	€80
#7	1	79	€79	0.33	20	0.67	110	€80
#8	1	84	€84	0.33	20	0.67	110	€80
#9	1	88	€88	0.33	20	0.67	110	€80
#10	1	93	€93	0.33	20	0.67	110	€80

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table 3.C.8: MPL-PGhigh

	Option A					Option B				
	p	€	p	€	EV(A)	p	€	p	€	EV(B)
#1	0.5	90	0.5	70	€80	0.5	103	0.5	35	€69
#2	0.5	90	0.5	70	€80	0.5	109	0.5	35	€72
#3	0.5	90	0.5	70	€80	0.5	115	0.5	35	€75
#4	0.5	90	0.5	70	€80	0.5	122	0.5	35	€79
#5	0.5	90	0.5	70	€80	0.5	128	0.5	35	€82
#6	0.5	90	0.5	70	€80	0.5	131	0.5	35	€83
#7	0.5	90	0.5	70	€80	0.5	138	0.5	35	€87
#8	0.5	90	0.5	70	€80	0.5	153	0.5	35	€94
#9	0.5	90	0.5	70	€80	0.5	170	0.5	35	€103
#10	0.5	90	0.5	70	€80	0.5	186	0.5	35	€111

Notes: EV(A) and EV(B) list the expected value of the related lottery.

The decision tasks were presented in lists of binary choices with information about the probabilities and outcomes. Figure 3.C.7 shows an example of MPL-PGp 1 as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 3.C.8 shows the screen with instructions and Figures 3.C.9 and 3.C.10 show the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

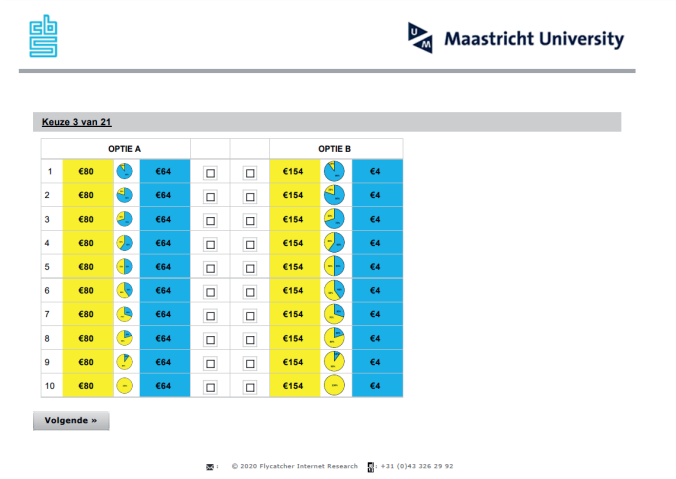


Figure 3.C.7: Example Decision Screen MPL-PGp 1

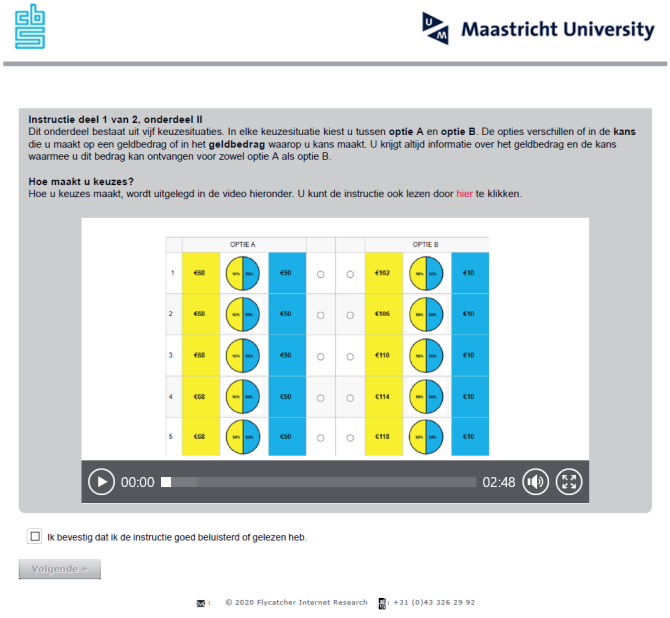


Figure 3.C.8: Instructions Screen rMPL

Instructions part [1.2/2]
This part consists of five decision situations. In each decision situation you choose between **option A** and **option B**. The options differ either in the **probability** of earning a sum of money or in the **amount** of money that you can earn with a certain probability. You will always receive information about the amount of money and the chance with which you can receive this amount for both option A and option B.

How do you make choices?
How you make choices is explained using the two examples below.

Decision situation Type 1
The screen shows a decision situation in which you are asked to make a choice between **option A** and **option B** in **each row** (in this example 1 to 5).

In this example, **Option A is the same in every row**. In this option you will see two amounts, in this example **€68** (the amount with the yellow background) and **€50** (the amount with the blue background). If you choose option A, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts. In this example, **the probability of receiving €68 is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €50 is 50%** (i.e. a 5 in 10 chance).

In this example, **Option B is different in each row**. In this option you will see two amounts in each row, in this example **€102 or more** (the amount with the yellow background) and **€10** (the amount with the blue background). If you choose option B, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts. In this example, **the probability of receiving €102 or more is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €10 is 50%** (i.e. a 5 in 10 chance).

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

On the next page are instructions for the example of Decision Situation Type 2.

Figure 3.C.9: Written Instructions rMPL Page 1 (Translated from Dutch)

Decision situation Type 2
The screen shows a decision situation in which you are asked to make a choice between **option A** and **option B** in **each row** (in this example 1 to 5).

Option A is different in each row. In this option you will see two amounts, in this example **€68** (the amount with the yellow background) and **€50** (the amount with the blue background). If you choose option A, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts and differs per row. For example, in row 1, the top row, **the probability of receiving €68 is 10%** (i.e. a 1 in 10 chance) and **the probability of receiving €50 is 90%** (i.e. a 9 in 10 chance). For example, in row 5, the bottom row, **the probability of receiving €68 is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €50 is 50%** (i.e. a 5 in 10 chance).

Option B is different in each row. In this option you see two different amounts than in option A, in this example **€106** (the amount with the yellow background) and **€10** (the amount with the blue background). If you choose option B, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts and differs per row. The probability of receiving the amount with the yellow or blue background are the same in option A as in option B in each row. For example, in row 1, the top row, **the probability of receiving €106 is 10%** (i.e. a chance of 1 in 10) and **the probability of receiving €10 is 90%** (i.e. a 9 in 10 chance). For example, in row 5, the bottom row, **the probability of receiving €106 is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €10 is 50%** (i.e. a 5 in 10 chance).

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

Figure 3.C.10: Written Instructions rMPL Page 2 (Translated from Dutch)

Solidarity Game. For the solidarity game, participants only received written instructions. Figure 3.C.11 shows the screen with instructions and Figure 3.C.12 shows the decision screen as presented to participants.

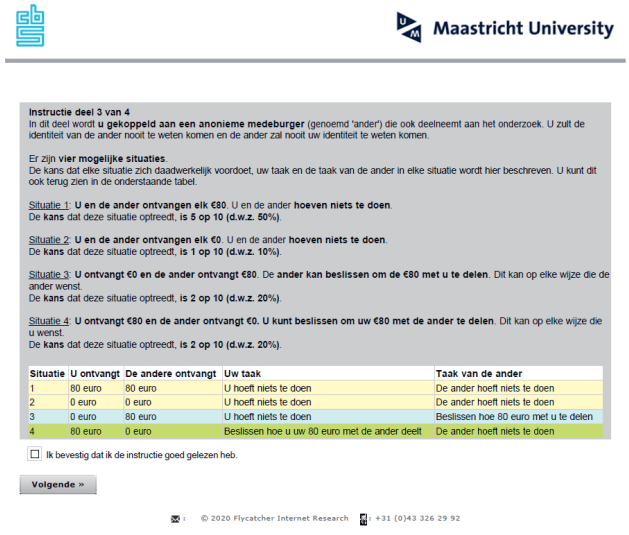


Figure 3.C.11: Instructions Screen Solidarity Game

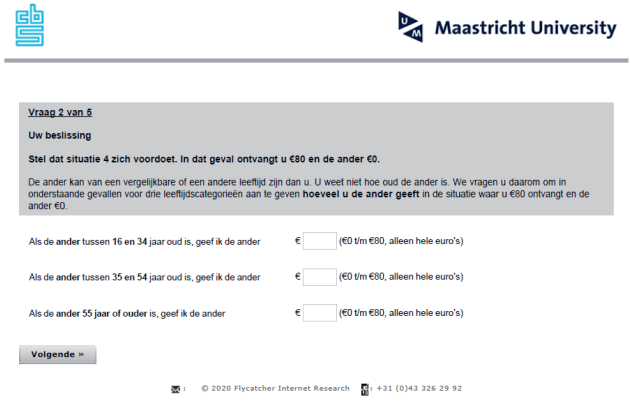


Figure 3.C.12: Decision Screen Solidarity Game

4

The Robustness of Preferences During a Crisis

Adapted from: Bokern, P., Linde, J., Riedl, A., & Werner, P. (2021). The effect of the COVID-19 crisis on economic and social preferences. *Netspar Academic Series*, *DP 12/2021-031*.

Abstract

Using incentivized decision tasks, we elicit risk, ambiguity, time, and social preferences in a heterogeneous sample from the Dutch population, directly before and over a one-year period during the COVID-19 pandemic, including two lockdown phases. This allows us to draw causal inferences on how the COVID-19 crisis affects preferences. By controlling for heterogeneity among participants' exposure to the COVID-19 crisis in a variety of domains we also analyze if and how preferences respond to the degree an individual is affected by the pandemic. We find that economic preferences remain remarkably stable during the COVID-19 pandemic. Comparing preferences before the start and during the pandemic, we do not observe robust differences in any of the elicited preferences. Moreover, individual differences in exposure to the crisis in the health domain and beliefs about the duration of the crisis do not seem to affect preferences. We observe some shifts in risk, ambiguity, and social preferences among participants with high exposure to the crisis in the financial or career domain.

4.1 Introduction

The COVID-19 pandemic had a substantial impact on people's lives all over the world. Apart from significant health risks, the pandemic and related policy measures severely affected various aspects of the economy and society. Negative economic consequences of the crisis emerged for instance through the reduction of consumer demand, increases in unemployment rates, changes in labor conditions, and shocks in financial markets. In the societal domain, there were adverse effects on well-being and mental health, among others (Brodeur et al., 2021 provide an extensive review). Nevertheless, there is considerable heterogeneity in how people respond to such crises, for instance in their beliefs and willingness to follow behavioral measures (e.g., Allcott et al., 2020; Barrios and Hochberg, 2020; Fan et al., 2020). Insights from the social and behavioral sciences can therefore provide an important source of knowledge for governments to cope with the negative societal effects of such crises and design effective policies (Van Bavel et al., 2020).

At the same time, it is important to understand the effect that exogenous shocks, such as the COVID-19 pandemic, may have on preferences and beliefs.[1] If preferences and beliefs are affected by exogenous shocks, then it is important that they are continuously monitored to design well-informed policies. To obtain insights into the stability of preferences, we investigate the effect of the COVID-19 crisis on risk, time, ambiguity, and social preferences. For this purpose, we implemented incentivized economic experiments in a large population sample from the Netherlands at different points in time before and during the crisis. Our first experimental wave was conducted right before the start of the COVID-19 crisis; the second, third, and fourth waves took place during the first and second lockdown phases in the Netherlands. Altogether, our experimental waves cover more than one year of the COVID-19 crisis. Comparing data from the waves during the crisis with data elicited before the start of the pandemic enables us to identify causal effects of the crisis on preferences. In addition, with the data elicited during the crisis, we analyze if and how differences in individual exposure to COVID-19 are correlated with differences in economic and social preferences.

From a theoretical perspective, preferences may respond to external circum-

[1] Evidence by Beine et al. (2020) for instance suggests that exposure to a natural disaster, in this case, two earthquakes, leads to increased risk aversion and more impatience among participants, using data elicited before and after the earthquakes. See also Chuang and Schechter (2015), who review the impact of exogenous shocks on economic preferences more generally.

stances, such as economic incentives and the environment a decision-maker is confronted with (Bowles and Polania-Reyes, 2012). Laboratory experiments show for instance that previous exposure to economic institutions may have spillover effects on behavior (see, for example, Brandts and Riedl, 2020; Engl et al., 2021, and the references therein). A possible shift in preferences following the experience of the COVID-19 crisis might affect economic behavior in a wide range of domains, including longer-term economic and social developments that determine a country's recovery from the crisis. For example, changes in risk, ambiguity, or time preferences may affect the way people save and invest with both micro- and macroeconomic consequences for wealth accumulation and productivity. Changes in social preferences might shift support for welfare programs, potentially including support for those affected by the pandemic, and the attitude towards economic recovery initiatives with distributional consequences.[2]

We are not the first to investigate the effect of the COVID-19 crisis on preferences, but the findings are mixed (Umer, 2023b provides an extensive review).[3] Concerning risk preferences, people were found to become more risk averse (Li et al., 2020), less risk averse (Adema et al., 2022; Gassmann et al., 2022; Shachat et al., 2021), or were not affected (Angrisani et al., 2020; Drichoutis and Nayga, 2022; Harrison et al., 2022; Lohmann et al., 2023). Additionally, some studies found varying results in the same sample, depending on the elicitation method (Aksoy et al., 2021; Zhang and Palma, 2021). Ambiguity aversion was found to increase (Shachat et al., 2021) and decrease (Gassmann et al., 2022). Time preferences were found to remain stable in most studies (Drichoutis and Nayga, 2022; Gassmann et al., 2022; Harrison et al., 2022; Lohmann et al., 2023), except in Li et al. (2020) where participants became less patient. Finally, social preferences, specifically altruism, have been found to increase (Aksoy et al., 2021; Shachat et al., 2021) or remain stable (Lohmann et al., 2023).[4]

[2] Theoretical arguments and empirical evidence suggest that risk preferences are correlated with investing and occupational decisions, such as becoming self-employed (Beauchamp et al., 2017; Menkhoff and Sakha, 2017), time preferences are correlated with savings decisions (Falk et al., 2018; Sutter et al., 2013), wealth (Huffman et al., 2019), and saving and planning for retirement (R. L. Clark et al., 2019), and ambiguity preferences are related to stock market participation (Dimmock et al., 2016) as well as portfolio choices (Bianchi and Tallon, 2019). Social preferences have been found to influence attitudes towards re-distributive policies and the willingness to donate money or to volunteer (Almas et al., 2020; Falk et al., 2018).

[3] We discuss the related literature in some detail in the next section.

[4] Umer (2023b) also discusses results based on unincentivized elicitation methods and concludes that those show even higher variability.

Despite this large body of literature analyzing how the COVID-19 crisis affects preferences, the majority of previous studies are based on student samples that can be expected to be relatively homogeneous concerning the exposure to the crisis and the personal risks associated with COVID-19.[5] Yet, to develop effective policy measures to mitigate the negative impact of the pandemic, it is crucial to consider potential shifts in the economic and social preferences of a broader range of population groups. The main contribution of our study is that our analysis is based on a wide range of incentivized experimental measures implemented in a large general population sample. In addition, our measures are elicited over a period of more than one year, allowing us to investigate potential medium-term preference responses and to take into account people's experience of repeated lockdowns. Finally, besides the measurement of causal effects of the pandemic on preferences across experimental waves, we can also observe within each experimental wave how various measures for self-stated individual exposure to COVID-19 during the crisis affect our preference measures.

We find that economic and social preferences are remarkably stable during both the first and the second lockdown, although there appear to be short-term fluctuations in some of our measures. Comparing preferences directly before the start of the crisis and at several points up to one year after the start of the first lockdown in the Netherlands, we do not observe robust significant differences in any preference domain. Within the sample of participants who participated during the pandemic, we find that individual exposure in the financial and career domains seems to shift risk, ambiguity, and social preferences somewhat. At the same time, individual exposure to the crisis in the health domain and beliefs concerning the duration of the crisis do not seem to change preferences.

The remainder of this chapter is structured as follows. In Section 4.2, we briefly review related experimental economics literature that investigates the effect of the COVID-19 crisis on preferences. In Section 4.3 we describe the experimental implementation and decision tasks in detail. The results are presented in Section 4.4. Section 4.5 discusses the results and concludes.

[5]Some exceptions are Angrisani et al. (2020) who have a small number of traders in their sample, and Aksoy et al. (2021) and Zhang and Palma (2021) who both consider a sample from Amazon Mechanical Turk (AMT). A number of other studies consider a general population sample but only have post-pandemic data and/or only use non-incentivized measures (e.g., Adena and Harke, 2022; Brañas-Garza et al., 2022; Guenther et al., 2021; Meunier and Ohadi, 2021; Umer, 2023a).

4.2 Related Literature

Several studies investigated the effect of COVID-19 on economic and social preferences since the start of the pandemic. Existing studies are based on a multiplicity of approaches, including both hypothetical and incentivized decision tasks as well as surveys that are elicited pre- and post-pandemic or are based solely on post-pandemic data (Umer, 2023b provides an extensive review). We briefly review studies that, similar to ours, elicited incentivized economic experiments to investigate the effect of COVID-19 on risk, ambiguity, time, or social preferences.

Gassmann et al. (2022), Lohmann et al. (2023), and Shachat et al. (2021) are closest to our study in terms of the variety of measures they collect, but they all consider student samples. Gassmann et al. (2022) elicit incentivized measures for risk, time, and ambiguity preferences using multiple price lists (e.g., Holt and Laury, 2002) in a sample of French students. The sample is collected over three months during and after the end of the first lockdown in France and compared to preferences that were elicited in a comparable sample several years before the crisis. The authors find that risk and ambiguity aversion decrease during the lockdown relative to their base levels and increase again after the lockdown (but not reaching the original base level). Participants also become less patient during the lockdown, but patience moves again in the direction of the base level after the lockdown. Lohmann et al. (2023) elicit risk, time, and social preferences pre- and post-pandemic in a sample of Chinese students. Risk preferences are measured with a lottery choice task by Eckel and Grossman (2002) and the investment task by Gneezy and Potters (1997), time preferences with Convex Time Budgets (Andreoni & Sprenger, 2012a), and social preferences with dictator games. On the aggregate, exposure to COVID-19 does not significantly affect preferences whereas there is some evidence for heterogeneous responses among men and women.[6] Shachat et al. (2021) elicit risk, ambiguity, and social preferences in a sample of Chinese students, both pre-pandemic and in multiple waves over six weeks during the crisis. Risk and ambiguity preferences are elicited with multiple price lists and social preferences with dictator games. The authors observe an increase in risk tolerance, ambiguity aversion, and altruism in the early waves of their study.

Several studies elicit both risk and time preferences or risk and social preferences. Drichoutis and Nayga (2022) elicit risk and time preferences among

[6] Men decrease risk-taking in the Gneezy and Potters task and become less likely to be present-biased with higher exposure.

Greek students using multiple price lists both before and in two waves during the crisis and report that the preferences remain stable across all three waves. Li et al. (2020) use multiple price lists in a sample of Chinese students and find that participants were more risk averse and less patient after the start of the pandemic. Harrison et al. (2022) measure atemporal risk preferences, time preferences, and intertemporal risk preferences among US students in several waves during the crisis with unordered incentivized lottery choices. The authors find that the atemporal risk premium increases during the crisis whereas time preferences and intertemporal risk preferences remain stable. Aksoy et al. (2021) elicit both risk and social preferences in a sample of Amazon Mechanical Turk (AMT) workers in the US. Risk preferences are measured with a multiple price list and the investment task. They find that after the start of the pandemic risk aversion decreases in the investment task, whereas it increases in the multiple price lists. Social preferences were elicited with a dictator game and they find that participants became more altruistic after the start of the pandemic.

Another set of studies collects one type of incentivized preference measure. Angrisani et al. (2020) elicit risk preferences of students and professional traders with the Bomb Risk Elicitation Task (Crosetto and Filippin, 2013) before and at the beginning of the crisis and report no overall preference change.[7] Adema et al. (2022) elicit risk preferences with a lottery choice and find that participants were less risk averse after the start of the pandemic. Zhang and Palma (2021) elicit risk preferences with a lottery choice task and the balloon analogue risk task (Lejuez et al., 2002). They find no changes in risk aversion measured with the lottery choice task, but at the same time, risk aversion measured with the balloon analogue risk task increases. Brañas-Garza et al. (2022) investigate charitable donations in a sample of Spanish citizens during the initial phase of the crisis and find it decreased with the degree of exposure to the crisis.

4.3 Experimental Design and Procedures

We report in detail on the implementation and the timing of the experiment. Thereafter, we describe the different tasks used to elicit risk, ambiguity, time, and social preferences. Finally, we describe our survey questions used to capture the extent to which individuals were exposed to the COVID-19 crisis.

[7] At the same time, the authors find heterogeneous effects of personal experiences with COVID-19 (i.e. infection of oneself or a close friend or family member) on preferences.

4.3.1 Timing and Implementation

Our study consisted of altogether four waves at multiple stages of the COVID-19 crisis in the Netherlands (see Figure 4.3.1). The field time of the first wave was from February, 20 to March 2, 2020, and thus shortly before the crisis was recognized as such in the Netherlands (and most parts of Europe, except for Italy).[8] Shortly thereafter, the first lockdown was introduced in the Netherlands. To test the short-run impact of the uncertainty around COVID-19 and the initial lockdown on our preference measures, we implemented a second wave between April 22 and April 29, 2020. After a quiet period, with few restrictions, COVID-19 became more prevalent again at the end of 2020 and a "partial" lockdown started on October 13. To gauge the long-run impact of COVID-19 and the restrictions, we implemented a third wave that took place between November 11, 2020, and November 18, 2020. The restrictions tightened further on December 15 and the term lockdown was used again. Around the same time, however, the first positive signs concerning vaccination popped up and in January the first vaccination was administered in the Netherlands. Nevertheless, the end of this lockdown would only be announced at the end of April 2021. Throughout May, the restrictions were lifted one-by-one using a re-opening plan and the lockdown officially ended on June 5. To test the impact of this long, very strict, lockdown, we decided to implement a final wave between April 21 and April 29, 2021, right before the first relaxation of restrictions occurred.

In all four waves, we implemented an identical set of preference elicitation tasks to measure risk, ambiguity, time, and social preferences. Waves 2 to 4 additionally included an extensive questionnaire on participants' exposure to the crisis, the effects of the crisis in various domains (e.g., health and economy), as well as their beliefs concerning the crisis and the future development of the economy. The experiments were programmed and implemented online by the research agency Flycatcher. Flycatcher operates a panel of about 10,000 members recruited from the Dutch general population who are regularly invited to participate in online studies. Participants were recruited through e-mail.

[8] The initial wave was originally planned as a pilot session for a large scale study among a representative sample of the Dutch population. The study served as a test run of the parameters and presentation of the elicitation tasks. Consequently, we have two versions for some of the preference measures with slight differences in the parameters used (see Section 4.3.2 for details).

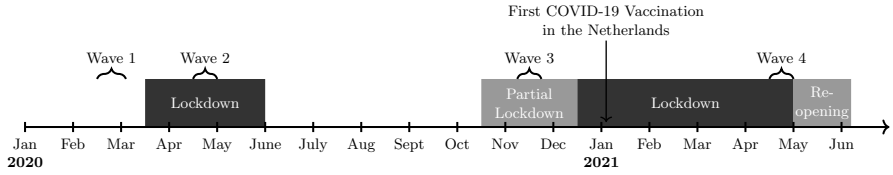


Figure 4.3.1: Timeline COVID-19 in the Netherlands and Study Implementation

Notes: The first lockdown started on March 15, 2020, with the closing of schools, restaurants, and sports clubs, and was extended on March 23, 2020, with further restrictions on public gatherings. On April 21, 2020, the Dutch government announced that schools opened again by May 11, 2020, and further plans to relax the general lockdown measures were published on May 6, 2020. A second "partial" lockdown with fewer restrictions started on October 13, 2020. During November and December, however, the government increased the restrictions step-by-step and as of December 15, 2020, the term lockdown was used again. On January 23, 2021, restrictions were tightened even further with the introduction of an evening curfew. On April 20, 2021, the government announced the start of its reopening plan that would become active on April 28, 2021. As part of the reopening plan, the evening curfew would be lifted and shops and outdoor areas of restaurants and cafes would partially reopen. The lockdown officially ended on June 5, 2021. For a detailed timeline, see https://bit.ly/covid19-timeline-NL (last retrieved May 2023).

Altogether 1035 individuals between 18 and 67 years took part in our study (125 in wave 1, 290 in wave 2, 314 in wave 3, and 306 in wave 4).[9] All waves were conducted on a unique set of participants, thus no one participated in multiple waves. Our sample covers a wide range of population groups in the Netherlands in terms of age, sex, education, and income. A comparison of the samples across waves shows that there are no significant differences in the composition of the waves concerning the background variables of participants, except for education levels (see Appendix 4.A). We control for demographic and socioeconomic background characteristics in later analyses.

Participants were informed that one out of ten participants would be randomly selected to receive payments dependent on their decisions.[10] One

[9]The number of participants that received version 1 (2) of the experiment was 51 (74), 146 (144), 151 (163) and 154 (152), respectively for waves 1 to 4. We conducted a third version of the tasks with an additional 145 participants in wave 2 as a further test of parameters for our large-scale study. Because version 3 was elicited only in wave 2, we do not use this data for further analyses.

[10]Participants could choose at the end of the study whether they wanted to be contacted for payments. Across all waves, 92.6% of the participants chose to be contacted for payments (between 92.0% and 93.8%, depending on the specific wave). The random draw to determine

choice of these participants was then randomly picked and paid out. The median participation time in our study was 36, 45, 46, and 44 minutes in waves 1 to 4, respectively.[11] Participants received on average €7.66 in wave 1, €8.06 in wave 2, €6.61 in wave 3 and €6.58 in wave 4.[12] The amounts were paid out via bank transfers with the help of Flycatcher in a way that guaranteed anonymity of the participants towards the research team.

4.3.2 Preference Elicitation Tasks

We elicited risk, time, ambiguity, and social preferences with several complimentary experimental tasks.[13] Risk and time preferences were elicited jointly with the convex time budget (CTB; Andreoni and Sprenger, 2012a) and separately with several multiple price lists (MPLs) in the spirit of Holt and Laury (2002) and Coller and Williams (1999), respectively. To infer risk preferences from participants' decisions in the tasks, we rely on simple count measures because they do not require any assumptions about the model of decision-making under risk or the functional form. Higher-order risk preferences were elicited with five binary choices for prudence and five binary choices for temperance, following Noussair et al. (2014) Ambiguity aversion was elicited with MPLs, in the spirit of Cettolin and Riedl (2019). Social preferences were elicited with a modified version of the solidarity game by Selten and Ockenfels (1998). We discuss the tasks below. More detailed information on the experimental design and screenshots can be found in Appendix 4.E.

To facilitate understanding of the decision tasks we used graphical elements for the display of the decision tasks. Moreover, the tasks were explained through short video clips that participants watched before each task. The videos explained the decision tasks step by step, successively highlighting the relevant parts of the decision screens.[14] In addition to the video clips, written instructions were available for online reading and download. Importantly, the perceived clarity of the experimental instructions was high for all experimental tasks and irrespective of the format (video or written instructions), as Tables 4.B.1 and 4.B.2 in Appendix 4.B show. The average reported

which participants received payment was done on the subset of participants who wanted to be paid.

[11] In waves 2 to 4 participants spend more time due to the additional survey questions related to COVID-19 that were included at the end of the study.

[12] This is close to working 45 minutes at the Dutch minimum wage in 2020 (which was €9.70 per hour for a 40-hour workweek, see https://bit.ly/wage-Dutch, last retrieved May 2023)

[13] A complete overview of the material is available at http://bit.ly/pbbs-covid19.

[14] The videos are available at http://bit.ly/pbbs-covid19 (in Dutch).

clarity of the instructions generally ranges between values of 8 and 9 on a scale from 0 (completely unclear) to 10 (very clear).

CTB. We implemented an adapted version of the CTB (Andreoni and Sprenger, 2012a; Potters et al., 2016), which jointly elicits risk and time preferences. In our implementation, participants received two sets of 12 decision tasks sequentially (see Table 4.E.1 in the Appendix). In each decision task, participants allocated money between an earlier date, which was 8 weeks from the day of participation, and a later date, which was 12, 16, or 24 weeks from the day of participation depending on the task and version.[15] Payments allocated to the early date were always certain, whereas payments to later dates were paid with a 50%, 70%, 90%, or 100% chance, depending on the decision task. The probabilities were known to participants. Depending on the decision task, the amounts allocated to the later date paid an interest rate of 0%, 4%, or 16% over the period by which the payment was delayed. The budget to be allocated by the decision-maker was always €75. When the chance of future payments was below 100% the amount to be paid was increased such that the expected value of the future payment matched the certain payment in the 100% payout case. To simplify the decisions, each choice set was discretized into 13 predefined allocations. Two of the predefined allocations constituted dominated choices, which serve as a comprehension and attention check.[16]

To infer risk preferences from the CTB, we compare allocations in decision tasks with risk (that is, the decision situations where the later payoff was obtained with a 90%, 70%, or 50% chance) to allocations in their risk-less counterpart (i.e., the decision situation where the later payoff was obtained with a 100% chance). If an individual allocates less (more) money to the later date in the task with risk, compared to its risk-less counterpart, then we categorize the allocation as risk-averse (seeking). If the individual allocates the same in both, then we categorize the allocation as risk neutral.[17] As a measure of risk preference, we simply count the number of decisions that are classified as

[15] In version 1 (2), the late date was 12 (16) weeks from the day of participation in the first set of decision tasks and 16 (24) weeks from the day of participation in the second set of decision tasks.

[16] The majority of participants (827, 80% of the entire sample) never make a dominated choice. We control for whether a participant makes at least one dominated choice in the regressions.

[17] If an individual makes a corner choice in both the decision with risk and their risk-less counterpart, then we categorize the pairs of corner choices at the early (late) date as risk-averse (seeking).

risk-seeking (RS) with weight=-1, risk-neutral (RN) with weight=0, and risk-averse (RA) with weight=1 for both sets and take the average. Larger values of this variable are thus associated with a stronger tendency of the participant to avoid risk. For time preferences, we simply take the average euro amount a participant allocates to the late period in risk-less decision situations (i.e., the decision situation where the later payoff was obtained with a 100% chance). Larger values for this variable are thus associated with higher patience of the decision-maker.

MPL. We also elicited risk and time preferences separately using MPLs in the spirit of Holt and Laury (2002) and Coller and Williams (1999), respectively. Time preferences were elicited with two tMPLs (see Tables 4.E.2 and 4.E.3 in the Appendix). In each tMPL, participants made nine choices between €75 at an early date (8 weeks from the day of participation, just as in the CTB) and varying amounts to be paid at a later date (in 12 or 16 weeks and 16 or 24 weeks, depending on the version). Moving down the list, the amount to be paid at the later date increased, yielding interest rates between 0% and 21.3% over the delay period. The decision situation where participants switched from the early to the late option defined an interval for their individual time preferences. We take the average number of patient choices (favoring the later option) across both tMPLs as a simple measure for participants' time preference, with higher values indicating higher patience. Risk preferences were elicited using two rMPLs (see Tables 4.E.4 and 4.E.5 in the Appendix). In each rMPL, participants made nine choices between a certain payoff and a lottery that paid a lower and a higher payoff with a given probability. The probability for the low (high) payoff was either 0.50 (0.50) or 0.33 (0.67). The outcomes and probabilities remained the same within each MPL, whereas the value for certain payoffs increased across rows. We take the average number of safe choices across both rMPLs as a simple measure for participants' risk aversion, with a higher number of safe choices indicating higher aversion against risk.

Higher-order risk preferences were elicited using measures introduced by Noussair et al. (2014) (see Tables 4.E.6 and 4.E.7 in the Appendix). To elicit prudence, participants faced a series of five binary decision situations. In each decision situation, participants received a lottery that would yield a high or a low outcome with equal probability. They were then asked to choose whether they wanted to add a zero-mean lottery to the state of high wealth or the state of low wealth. Prudent decision-makers would add the lottery

to the state of high wealth. As a measure of prudence, we simply count the number of prudent choices. Temperance was also elicited with five binary decision situations. In each decision situation, participants received a fixed payment and had to decide whether they wanted to aggregate or disaggregate two identical zero-mean lotteries. Temperate participants would prefer disaggregation of the lotteries. As a measure of temperance, we simply count the number of temperate choices.

Ambiguity preferences were elicited with two aMPLs in which participants had to choose between risky lotteries with known probabilities of winning and an ambiguous lottery where the probability of winning was unknown (see Table 4.E.8 in the Appendix). Participants also had the option to state indifference, in which case a fair random device chose between the options for them (following Cettolin & Riedl, 2019). The winning probabilities in the lotteries were displayed with red and blue balls in urns. The left urn contained 10 red or blue balls in a known and displayed proportion. The right urn also contained 10 red or blue balls, but the urn was made opaque so that the proportion of red and blue balls was unknown to the participant. Participants were informed that the proportion of red and blue balls in the ambiguous urn stayed the same within each and between both aMPLs. The proportion of red and blue balls in the risky urn varied from all red in the first row of an aMPL to all blue in the last row. The two aMPLs differed only concerning the color associated with winning the lottery. To control whether a participant fully understood the task, we added a dominated option to each aMPL consisting of an urn with a displayed proportion of 10 balls of the losing color.[18] We look at two measures for ambiguity. First, we count the number of times the risky lottery is chosen in both aMPLs and take the average, where a higher number can be interpreted as more ambiguity aversion. Second, we count the number of consecutive indifference choices. If an individual chooses more than one indifference choice in the aMPLs, this can be interpreted as incomplete preferences or preference for randomization (Cettolin and Riedl, 2019), thus a higher number can be interpreted as less complete preferences or a stronger preference for randomization.

[18] The majority of participants (984, 83% of the entire sample) never make a dominated choice. We control for dominated choices in the regressions. In addition to dominated choices, we also did not enforce consistency in participants' choices in the tMPLs, rMPLs, and aMPLs. Thus, we allowed participants to switch multiple times and in the direction of the option that is becoming less attractive. The number of participants who make at least one inconsistent choice in the tMPLs, rMPLs, and aMPLs, is 72 (6%), 109 (9%), and 306 (26%), respectively.

Solidarity Game. Social preferences were elicited with a modified version of the solidarity game by Selten and Ockenfels (1998). Participants were anonymously matched with another participant in the study and were confronted with one of the following four possible situations: (i) both participants win an amount of €80 (with 50% probability), (ii, iii) one participant wins an amount of €80 and the matched other wins nothing or vice versa (both with 20% probability), (iv) both receive nothing (with 10% probability).

Applying the strategy method (Selten, 1967), we elicited social preferences towards different age groups, similarly to Riedl et al. (2019). Specifically, for the case where they would be the sole winner, participants had to decide on the amount of money they were willing to transfer to (a) a young participant (between 16 and 34 years), (b) a middle-aged participant (between 35 and 64 years), and (c) an old participant (65 years and older). We take the average amount sent to others as a measure of social preference. We also asked participants what they expected to receive from another participant (in each age group) in case the other person would be the sole winner. Thus, measuring participants' beliefs about the solidarity of others. Here, we also take the average over all age groups as a measure of expected solidarity.

4.3.3 Survey Questions COVID-19

To gauge how exposed individuals were to the COVID-19 crisis, we implemented a battery of survey questions. First, we asked participants whether they or a close friend or relative had contracted COVID-19 (health exposure).[19] We create a binary variable that captures whether the participant responded "yes" to either question. Second, we asked participants how they perceived the impact of COVID-19 on their financial situation and career perspective.[20] We create two variables that capture whether the participant's financial situation or career perspective worsened, stayed the same, or improved. Third, we asked participants about their beliefs about when every-

[19] Exact wording (translated from Dutch): (i) "Were or are you infected with the so-called coronavirus (COVID-19)?" [yes, no, not sure, prefer not to answer], (ii) "Was or is one of your family members or close friends infected with the so-called coronavirus (COVID-19)?" [yes, no, not sure, prefer not to answer]

[20] Exact wording (translated from Dutch): (i) "In your opinion, to what extent did your financial situation change as a result of the so-called coronavirus (COVID-19)?" [scale 1-5, where 1 = clearly worsened and 5 = clearly improved, prefer not to answer, not applicable], (ii) "In your opinion, to what extent did your career perspective change as a result of the so-called coronavirus (COVID-19)?" [scale 1-5, where 1 = clearly worsened and 5 = clearly improved, prefer not to answer, not applicable].

Table 4.3.1: Self-reported Exposure to COVID-19

	Wave 2		Wave 3		Wave 4	
	N	%	N	%	N	%
Health Exposure						
No infection	255	87.9	191	60.8	143	46.7
Infection	35	12.1	123	39.2	163	53.3
Total	290	100.0	314	100.0	306	100.0
Financial Situation						
No change	212	73.4	211	69.4	192	64.6
Worsened	58	20.1	44	14.5	34	11.4
Improved	19	6.6	49	16.1	71	23.9
Total	289	100.0	304	100.0	297	100.0
Career Perspective						
No change	193	73.1	201	69.8	212	73.6
Worsened	58	22.0	57	19.8	41	14.2
Improved	13	4.9	30	10.4	35	12.2
Total	264	100.0	288	100.0	288	100.0
Situation back to normal						
Within 1 year	147	50.7	139	44.3	185	60.5
More than 1 year	143	49.3	175	55.7	121	39.5
Total	290	100.0	314	100.0	306	100.0

Notes: The responses "not applicable" and "prefer not to answer" are treated as missing. The total number of participants is 125 in Wave 1, 290 in Wave 2, 314 in Wave 3, and 306 in Wave 4.

thing would be back to normal.[21] We create a binary variable that captures whether the participant either beliefs that the situation will be back to normal within one year or that it will take longer.

Table 4.3.1 shows descriptive statistics of our survey questions to measure the exposure to COVID-19. As expected, it was quite rare that participants had COVID-19 or knew anyone who had it in wave 2, at the start of the pandemic, and it became more common in later waves. In terms of the impact of COVID-19 on the financial situation, the majority of participants in all waves indicated that they did not experience any change. For those who did experience changes, it worsened for the majority in Wave 2, whereas it improved for the majority in Wave 4. For the impact of COVID-19 on the career perspec-

[21] Exact wording (translated from Dutch): "When do you expect that all restrictions regarding the so-called coronavirus (COVID-19) will be lifted so that the situation in the Netherlands will return back to the pre-crisis situation?" [in one month, in three months, in six months, in nine months, in one year, in one and a half years, in more than one and a half years, never]

tive, the majority of participants in all waves similarly indicated that they did not experience any change. For those who did experience change, the majority in all waves indicated that it worsened, although the proportion becomes more equal in later waves. Participants' beliefs about the end of the crisis are roughly equally split between less than a year or more in wave 2, at the start of the pandemic. In wave 3, at the beginning of the second lockdown, participants became slightly more pessimistic and in wave 4, at the end of the second lockdown, participants became more optimistic.

4.4 Results

In the first part, we report results concerning the causal impact of the crisis on elicited economic and social preferences, by comparing behavior between the waves. Thereafter, we analyze to what extent heterogeneous exposure to the crisis affected preferences among the participants of waves 2 to 4.

4.4.1 The Causal Effect of the COVID-19 Crisis on Preferences

We investigate the causal effect of the crisis on preferences by comparing our measures across waves at the aggregate level. The analysis follows the same structure in each subsection. We first discuss the results descriptively by reporting average responses across waves and the p-value of a non-parametric Kruskal Wallis test analyzing differences across waves.[22] We then turn to parametric Ordinary Least Squares (OLS) regression analyses with the constructed measures for each participant in each task as the dependent variable. The first specification is a regression, where we only include dummy variables for the experimental waves, capturing changes in the preference measures in the course of the crisis relative to the situation before the crisis. In the second specification, we additionally include controls for demographic characteristics (age and sex) and socioeconomic background (education level, being a tenant or a homeowner, and income). In this specification, we also control for dominated choices.

[22] Figures 4.C.1–4.C.10 in Appendix 4.C also show histograms for each measure in every wave.

Risk Preferences

Table 4.4.1 reports the average of our risk preference measures for each wave. In all waves, participants are risk averse in both the rMPLs and the CTB. In the rMPLs, participants make between 6 and 7 safe choices on average, whereas risk-neutral participants should make only 2 to 3 safe choices. In the CTB, the weighted score is on average between 3 and 4, whereas a score of 0 indicates risk neutrality, and 9 is the strongest possible form of risk aversion.[23] For higher-order risk preferences, we find that participants make around 4 prudent choices on average. Participants behave slightly less temperate, with the average number of temperate choices between 3 and 4.

Table 4.4.1: Risk Preferences Across Waves - Descriptive Statistics

			Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**KW**
	Min	Max	Mean	SD	Mean	SD	Mean	SD	Mean	SD	P-value
Risk (rMPL)	0	9	6.6	2.6	6.5	2.7	6.3	2.7	6.1	2.9	0.354
Risk (CTB)	-9	9	3.7	4.7	3.7	4.6	3.3	4.6	3.9	4.4	0.456
Prudence	0	5	3.9	1.6	4.2	1.4	3.9	1.6	4.0	1.6	0.376
Temperance	0	5	3.7	1.7	3.5	1.8	3.6	1.8	3.3	1.9	0.363

Notes: Table reports means, standard deviations, and the p-values of Kruskal-Wallis tests.

Across waves, the average number of safe choices in the rMPLs decreases slightly. For the CTB, there is no clear trend. Prudence and temperance remain roughly stable across waves, although individuals appear to be slightly more prudent in wave 2 and slightly less temperate in wave 4. If we test for differences with non-parametric Kruskal-Wallis tests, however, none of the changes are found to be statistically significant. Our observations are largely supported by parametric analyses in Table 4.4.2, where we report the results of the regression analyses of simple and multiple regression models. The coefficients for the variables controlling for the waves are all small and statistically insignificant in the models for rMPLs (Models 1 and 2) and in the models for the CTB (Models 3 and 4). Participants behave somewhat more prudent on average in wave 2 ($p = 0.065$ in model 6) and somewhat less temperate in wave 4 ($p = 0.091$ in model 8), but there is no effect in the other waves. Overall, the COVID-19 crisis does not seem to robustly affect first- and higher-order risk preferences in our sample.

[23] In the rMPLs around 40 percent of participants choose the safe option in every decision (see Figure 4.C.1). In the CTB, for 25 to 30 percent of participants all choices are classified as risk-averse (Figure 4.C.2).

Table 4.4.2: First and Higher Order Risk Preferences

	Risk (rMPL)		Risk (CTB)		Prudence		Temperance	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Wave 2	-0.04	-0.03	0.05	-0.02	0.32*	0.31*	-0.18	-0.16
	(0.30)	(0.29)	(0.49)	(0.49)	(0.17)	(0.17)	(0.19)	(0.19)
Wave 3	-0.29	-0.29	-0.37	-0.41	0.06	0.05	-0.15	-0.12
	(0.29)	(0.28)	(0.48)	(0.48)	(0.17)	(0.16)	(0.19)	(0.19)
Wave 4	-0.46	-0.44	0.21	0.20	0.11	0.09	-0.36*	-0.33*
	(0.29)	(0.28)	(0.48)	(0.48)	(0.17)	(0.16)	(0.19)	(0.19)
Female		0.62***		0.65**		-0.02		0.44***
		(0.18)		(0.30)		(0.10)		(0.12)
Age		0.04***		0.00		-0.00		0.00
		(0.01)		(0.01)		(0.00)		(0.00)
Middle Educated		0.57**		0.41		0.21		-0.09
		(0.25)		(0.43)		(0.15)		(0.17)
High Educated		-0.33		-0.23		0.13		-0.33*
		(0.27)		(0.46)		(0.16)		(0.18)
Tenant		-0.23		-0.39		0.07		-0.08
		(0.19)		(0.32)		(0.11)		(0.13)
36.500 euro or more		-0.09		-0.48		0.10		-0.06
		(0.23)		(0.39)		(0.13)		(0.16)
Prefer not to state income		-0.09		-0.52		0.15		-0.07
		(0.27)		(0.45)		(0.15)		(0.18)
Dominated Choice		0.18		-1.58***		-0.53***		-0.06
		(0.18)		(0.31)		(0.11)		(0.12)
Constant	6.58***	4.68***	3.69***	4.10***	3.87***	3.97***	3.70***	3.61***
	(0.25)	(0.56)	(0.41)	(0.94)	(0.14)	(0.32)	(0.16)	(0.38)
Observations	1035	1035	1035	1035	1035	1035	1035	1035

Notes: Standard errors in parentheses. Risk (rMPL): average number of safe choices. Risk (CTB): average weighted count of RS (weight=-1), RN (weight=0), and RA (weight=1) choices. Prudence: number of prudent choices. Temperance: number of temperate choices. Baselevels: Wave 1, Male, Low Educated, Homeowner, Yearly income 36.500 euro or less, did not make dominated choices. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

We find several effects concerning the demographic and socioeconomic background of participants. In line with most previous literature (e.g., Croson and Gneezy, 2009), female participants make significantly more safe choices in our study, both in rMPLs ($p = 0.001$) and the CTB ($p = 0.031$). Moreover, women tend to make more temperate choices ($p < 0.001$), in line with Noussair et al. (2014). We find different effects of age depending on the experimental measure. Older participants seem to act in a more risk-averse manner in the rMPLs ($p < 0.001$), in line with Dohmen et al. (2011) and von Gaudecker et al. (2011), but we do not find any correlation of age with choices in the CTB ($p = 0.669$). Dummy variables for education are statistically significant in some of the models, but not systematically.

Ambiguity Preferences

The descriptive results in Table 4.4.3 show that participants choose the risky urn about five times on average in every wave, implying little ambiguity aversion. The average number of consecutive indifference choices is around two in all waves.[24]

Table 4.4.3: Ambiguity Preferences Across Waves - Descriptive Statistics

			Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**KW**
	Min	Max	Mean	SD	Mean	SD	Mean	SD	Mean	SD	P-value
Ambiguity Aversion	0	11	5.0	1.3	5.2	1.6	5.0	1.6	4.9	1.5	0.158
Consecutive Indiff.	0	11	1.8	2.0	1.9	2.0	1.7	2.1	1.8	2.3	0.441

Notes: Table reports means, standard deviations, and the p-values of Kruskal-Wallis tests.

Across waves, we observe only small differences, and none of the observed differences are found to be statistically significant in non-parametric Kruskal-Wallis tests. Table 4.4.4 reports the simple and multiple regression models for our measures of ambiguity preferences. In line with the descriptive statistics, we find no evidence that the pandemic affects ambiguity preferences in our setting. In particular, the dummy variables for all three waves are close to zero and statistically insignificant in all models. We also do not find a robust impact of any of the background variables.

[24] About half of the participants makes between zero and one consecutive indifference choices, while the other half makes more than one (see Figure 4.C.6).

Table 4.4.4: Ambiguity Preferences

	Ambiguity Aversion		**Consecutive Indiff.**	
	(1)	(2)	(3)	(4)
Wave 2	0.19	0.16	0.06	0.10
	(0.16)	(0.16)	(0.23)	(0.22)
Wave 3	-0.01	-0.03	-0.08	-0.06
	(0.16)	(0.16)	(0.23)	(0.21)
Wave 4	-0.06	-0.07	0.02	0.04
	(0.16)	(0.16)	(0.23)	(0.21)
Female		-0.09		0.00
		(0.10)		(0.13)
Age		-0.01		0.01
		(0.00)		(0.01)
Middle Educated		-0.06		0.07
		(0.14)		(0.19)
High Educated		0.01		-0.17
		(0.16)		(0.21)
Tenant		0.03		-0.01
		(0.11)		(0.14)
36.500 euro or more		0.02		-0.10
		(0.13)		(0.17)
Prefer not to state income		0.01		0.06
		(0.15)		(0.20)
Dominated Choice		-0.65***		1.45***
		(0.10)		(0.14)
Constant	5.00***	5.51***	1.80***	1.14***
	(0.14)	(0.32)	(0.19)	(0.42)
Observations	1035	1035	1035	1035

Notes: Standard errors in parentheses. Ambiguity Aversion: average number of risky urn choices. Consecutive Indiff.: average number of consecutive indifference choices. Baselevels: Wave 1, Male, Low Educated, Homeowner, Yearly income 36.500 euro or less, did not make dominated choices. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Time Preferences

Table 4.4.5 reports the descriptive results for time preferences across waves. Participants make on average between 5 and 6 patient choices across all waves. In the CTB, participants allocate on average between €38 and €40 (about 52% of the budget) to the later date.[25]

Table 4.4.5: Time Preferences Across Waves - Descriptive Statistics

			Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**KW**
	Min	Max	Mean	SD	Mean	SD	Mean	SD	Mean	SD	P-value
Time (tMPL)	0	9	5.7	2.8	5.5	2.7	5.3	2.7	5.8	2.6	0.152
Time (CTB)	0	75	39.6	19.1	40.1	18.3	38.1	18.8	39.4	19.4	0.470

Notes: Table reports means, standard deviations, and the p-values of Kruskal-Wallis tests.

We observe only small differences across waves and none of the these are found to be statistically significant in non-parametric Kruskal-Wallis tests. The observations are largely supported in parametric analyses (Table 4.4.6), where the dummy variables for the experimental waves are insignificant in all specifications. Concerning demographics, we find that older participants tend to behave less patiently in the CTB ($p = 0.004$), but not the tMPLs ($p = 0.120$). In addition, participants with middle and high education levels make somewhat more patient choices in the tMPLs ($p = 0.021$ and $p = 0.001$, respectively), but not in the CTB ($p = 0.423$ and $p = 0.810$, respectively). Finally, tenants behave in a somewhat less patient way in the tMPLs ($p = 0.009$), but this effect is not found for the CTB ($p = 0.960$).

[25] In the tMPLs, between 30 and 40 percent of participants always chose the patient choice when there is a positive interest rate (Figure 4.C.7). In the CTB, there is more heterogeneity across participants (Figure 4.C.8).

Table 4.4.6: Time Preferences

	Time (tMPL)		**Time (CTB)**	
	(1)	(2)	(3)	(4)
Wave 2	-0.24	-0.25	0.56	0.18
	(0.29)	(0.28)	(2.02)	(2.00)
Wave 3	-0.39	-0.42	-1.43	-1.66
	(0.28)	(0.28)	(2.00)	(1.98)
Wave 4	0.01	-0.05	-0.16	-0.36
	(0.28)	(0.28)	(2.00)	(1.98)
Female		0.05		-0.47
		(0.17)		(1.23)
Age		-0.01		-0.14***
		(0.01)		(0.05)
Middle Educated		0.58**		-1.41
		(0.25)		(1.76)
High Educated		0.92***		-0.46
		(0.27)		(1.90)
Tenant		-0.49***		0.07
		(0.19)		(1.32)
36.500 euro or more		-0.06		1.48
		(0.23)		(1.60)
Prefer not to state income		-0.10		0.72
		(0.26)		(1.85)
Dominated Choice		-0.72***		-6.72***
		(0.18)		(1.27)
Constant	5.74***	6.01***	39.57***	47.82***
	(0.24)	(0.55)	(1.69)	(3.88)
Observations	1035	1035	1035	1035

Notes: Standard errors in parentheses. Time (tMPL): average number of patient choices. Time (CTB): average amount allocated to the late period in decisions without risk. Baselevels: Wave 1, Male, Low Educated, Homeowner, Yearly income 36.500 euro or less, did not make dominated choices.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Social Preferences

Table 4.4.7 reports the average amount that participants sent to others, averaged over all target groups. We find that participants exhibit clear prosocial behavior by sending on average between €23 and €25, and thus between 29% and 32% of the endowment of €80. Interestingly, participants show substantial pessimism about the solidarity from other participants: expected transfers are substantially lower than the amounts sent in all waves.[26] Similar pessimistic expectations about solidarity have been found before in a large population sample (see Riedl et al., 2019).

Table 4.4.7: Social Preferences Across Waves - Descriptive Statistics

			Wave 1		**Wave 2**		**Wave 3**		**Wave 4**		**KW**
	Min	Max	Mean	SD	Mean	SD	Mean	SD	Mean	SD	P-value
Solidarity Sent	0	80	23.5	18.6	24.7	16.2	24.7	17.3	24.9	17.3	0.927
Solidarity Expected	0	80	17.3	15.3	18.1	14.7	20.1	16.4	19.6	16.4	0.361

Notes: Table reports means, standard deviations, and the p-values of Kruskal-Wallis tests.

Across waves, we observe little differences during the pandemic and none of the observed differences are found to be statistically significant in non-parametric Kruskal-Wallis tests. The descriptive results are largely supported by parametric analyses in Table 4.4.8. In Models 1 and 2, where we look at the average amount transferred to others, we find that the dummy variables for the experimental waves are all statistically insignificant. Similar results are found for Models 3 and 4, where we look at the average expected solidarity transfers. Concerning the effect of demographic background, we observe that women, older and highly educated participants expect lower solidarity from others ($p = 0.041$, $p = 0.045$, $p = 0.060$, respectively). In addition, tenants tend to transfer less compared to homeowners ($p = 0.050$).[27]

Taking all results together, we observe a remarkable stability of economic and social preferences, as there is no systematic and robust difference between preferences elicited shortly before the crises and preferences elicited over a one-year period during the COVID-19 pandemic including two lockdown phases in the Netherlands.

[26] If we compare average transfers and average expected transfers on the level of the individual participant (and separately for each wave) using two-sided Wilcoxon Matched Pairs Signed Ranks tests, all tests yield $p < 0.001$.

[27] The shares of fully selfish choices, i.e. average transfers of €0, also do not fluctuate strongly across waves, with 26.4%, 20.0%, 18.8%, and 22.2% for waves 1 to 4, respectively.

Table 4.4.8: Solidarity Preferences

	Solidarity Sent		**Solidarity Expected**	
	(1)	(2)	(3)	(4)
Wave 2	1.19	0.91	0.81	0.06
	(1.84)	(1.85)	(1.69)	(1.70)
Wave 3	1.17	0.93	2.77*	2.09
	(1.82)	(1.83)	(1.67)	(1.68)
Wave 4	1.37	1.34	2.29	1.93
	(1.82)	(1.83)	(1.68)	(1.68)
Female		0.45		-2.14**
		(1.14)		(1.05)
Age		0.06		-0.08**
		(0.04)		(0.04)
Middle Educated		-1.34		-1.23
		(1.63)		(1.50)
High Educated		-2.12		-3.04*
		(1.76)		(1.62)
Tenant		-2.40*		-1.82
		(1.22)		(1.12)
36.500 euro or more		0.12		-1.18
		(1.48)		(1.36)
Prefer not to state income		-0.87		-1.85
		(1.71)		(1.57)
Dominated Choice		-0.21		1.38
		(1.18)		(1.08)
Constant	23.53***	23.36***	17.29***	25.35***
	(1.54)	(3.59)	(1.41)	(3.30)
Observations	1035	1035	1035	1035

Notes: Standard errors in parentheses. Solidarity Sent: average amount sent to others. Solidarity Expected: average amount expected from others. Base-levels: Wave 1, Male, Low Educated, Homeowner, Yearly income 36.500 euro or less, did not make dominated choices. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.4.2 Exposure to COVID-19

The lack of changes in preferences between the different waves may mask individual heterogeneity in preference adjustments of participants, as those may depend on individual exposure to COVID-19. Specifically, we hypothesize that participants with a stronger health related exposure and participants who economically were hit severely will show a stronger response in preferences than other participants. In this section we test for this possibility.[28]

To analyze the impact of personal exposure to the crisis, we calculate regression models similar to those reported in the previous subsection. We summarize the results of all regression models in Table 4.4.9 by only reporting the coefficients and standard errors of the variable capturing individual exposure to the crisis. A table with all regression results can be found in Appendix 4.D. Models 1 to 4 concern first- and higher-order risk preferences (rMPL, CTB, prudence, and temperance), Models 5 and 6 concern time preferences (tMPL, CTB), Models 7 and 8 concern ambiguity preferences, and Models 9 and 10 concern solidarity preferences. All models control for demographic and socioeconomic backgrounds of the decision-maker and the version of the experimental tasks where applicable.

Table 4.4.9 shows that most of the variables capturing exposure to the crisis have little impact on our preference measures. In particular, none of the coefficients for exposure to the COVID-19 crisis in the health domain and beliefs about the further duration of the crisis are statistically significant. Yet, we find that there are several, albeit small, effects of exposure to the crisis in the financial and career domain. In particular, participants who state that the financial situation has improved during the crisis make less safe choices, thus behave less risk-averse, in the rMPLs ($p = 0.076$). However, the same effect is not found in the CTB ($p = 0.252$). On the contrary, participants who experienced a worsening of their financial situation tended to make more risk-averse choices in the CTB ($p = 0.011$), but not in the rMPLs ($p = 0.150$). They also make more prudent choices ($p = 0.032$) and fewer consecutive indifference choices in the aMPLs ($p = 0.023$). Participants who indicated that their career perspective worsened make less safe choices, thus behaving less risk-averse, in both the rMPLs ($p = 0.089$) and the CTB ($p = 0.011$). At the same time, they sent slightly more money to others in the solidarity game ($p = 0.090$). All in all, we find that individual exposure to the crisis in the

[28] For definitions and an overview of the variables capturing health and economic exposure, recall Section 4.3.3 and Table 4.3.1.

Table 4.4.9: Heterogenous Exposure to the COVID-19 crisis

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(i) Health exposure										
Infection	-0.08	0.22	-0.03	0.09	0.01	0.39	-0.11	-0.09	1.15	-0.30
	(0.20)	(0.33)	(0.11)	(0.13)	(0.19)	(1.36)	(0.11)	(0.15)	(1.25)	(1.17)
(ii) Financial Situation										
Worsened	0.41	1.22**	0.36**	-0.20	-0.28	-3.23	0.17	-0.49**	0.12	-1.39
	(0.29)	(0.48)	(0.17)	(0.20)	(0.28)	(1.99)	(0.16)	(0.21)	(1.84)	(1.72)
Improved	-0.48*	-0.51	-0.10	0.17	-0.19	-0.54	0.19	-0.32	-1.62	-1.64
	(0.27)	(0.45)	(0.16)	(0.18)	(0.26)	(1.86)	(0.15)	(0.20)	(1.72)	(1.61)
(iii) Career Perspective										
Worsened	-0.44*	-1.08**	0.09	0.13	-0.08	2.90	-0.06	-0.09	2.78*	1.87
	(0.26)	(0.43)	(0.15)	(0.18)	(0.25)	(1.78)	(0.15)	(0.19)	(1.64)	(1.53)
Improved	-0.27	-0.28	-0.13	-0.05	-0.23	3.11	0.04	-0.13	2.94	3.12
	(0.34)	(0.57)	(0.20)	(0.23)	(0.33)	(2.37)	(0.20)	(0.26)	(2.19)	(2.04)
(iv) Belief Back to Normal										
More than 1 year	0.05	0.18	0.06	0.02	0.22	-0.99	-0.02	-0.01	-0.29	-0.50
	(0.19)	(0.31)	(0.11)	(0.13)	(0.18)	(1.28)	(0.11)	(0.14)	(1.18)	(1.11)

Notes: (1) Risk (rMPL), (2) Risk (CTB), (3) Prudence, (4) Temperance, (5) Time (tMPL), (6) Time (CTB), (7) Ambiguity Aversion, (8) Consecutive Indiff. (9) Solidarity Sent, (10) Solidarity Expected. The table reports coefficients and standard errors in parenthesis of the impact variables from an OLS regression. All models include control variables for sex, age, education level, homeownership, income, and whether the individual made at least one dominated choice. A table with all regression results can be found in Appendix 4.D. Participants from wave 1 and participants that answered 'prefer not to answer' or 'not applicable' in any of the survey questions are excluded, leaving a total of 831 participants. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

financial and career domain seems to have some small effect on risk, ambiguity, and social preferences in our sample. Beliefs about the duration of the crisis and exposure to the crisis in the health domain are found to have no effect.

4.5 Discussion and Conclusion

We test the stability of economic and social preferences in the face of the COVID-19 crisis in a variety of domains. Our findings suggest that preferences are largely stable over the period of more than a year after the outbreak of the crisis: comparing preferences within our heterogeneous population samples elicited before the crisis as well as during the first and second lockdowns in the Netherlands, we do not find robust and significant shifts in preferences related to risk, ambiguity, time, and solidarity. In addition, exploiting participants' heterogeneity, we find that exposure to the COVID-19 crisis in the domain of health has little impact on economic preferences.

Participants' beliefs about the further duration of the crisis do not affect preferences either. Individual exposure in the financial and career domain seems to affect risk, ambiguity, and social preferences to some extent. By and large, however, the effects of individual exposure to the crisis on preferences turn out to be limited in our setting.

Our results only allow for conclusions concerning medium-term effects, and we acknowledge that our study is only one step in understanding the dynamics of preference development throughout a crisis. For the understanding of possible impacts of any crisis on preferences and for the formulation of adequate policies to respond to them, it is of crucial importance to measure preferences on an ongoing basis. This is important because economic and other consequences of a crisis might become visible for many people only in the longer term, and any effects may diverge among various population groups. In addition, potential preference adjustments might interact with societal and political responses to the crisis, such as the degree to which the government supports those who are most adversely affected.

In conclusion, we find remarkable stability in a large set of preferences during the COVID-19 crisis. The stability of economic preferences in our sample seems encouraging from both a theoretical and a practical perspective. If economic preferences are stable throughout crises, policy measures can be developed based on existing knowledge about how preferences are distributed within the population. Moreover, the stability of economic preferences would increase the predictive value of theoretical models that try to forecast the dynamics of economic interaction in the crisis. It is important to note, however, that our results are complementary to the literature on a topic that finds mixed results. Future studies could investigate the roots of these discrepancies in order to get a better understanding of the nature of preferences and their stability in the case of exogenous shocks.

Appendices

4.A Samples Comparison

Table 4.A.1: Age groups across waves

	Wave 1	**Wave 2**	**Wave 3**	**Wave 4**
	Prop.	Prop.	Prop.	Prop.
Age Category				
15 to 19 years	0.008	0.031	0.010	0.016
20 to 24 years	0.056	0.107	0.115	0.088
25 to 29 years	0.104	0.117	0.115	0.124
30 to 34 years	0.128	0.103	0.115	0.108
35 to 39 years	0.112	0.076	0.102	0.095
40 to 44 years	0.088	0.059	0.073	0.078
45 to 49 years	0.096	0.097	0.102	0.111
50 to 54 years	0.160	0.141	0.096	0.131
55 to 59 years	0.136	0.131	0.115	0.105
60 to 64 years	0.048	0.107	0.092	0.105
65 years and older	0.064	0.031	0.067	0.039
Obs	125	290	314	306

Pearson: Uncorrected chi2(30) = 26.932
F(30.00, 31020.00) = 0.897, p-value = 0.628

Table 4.A.2: Income levels across waves

	Wave 1	**Wave 2**	**Wave 3**	**Wave 4**
	Prop.	Prop.	Prop.	Prop.
Gross Yearly Income				
$<$ €14.100	0.048	0.045	0.057	0.052
$\geq$ €14.100 - $<$ €36.500	0.152	0.172	0.140	0.134
$\geq$ €36.500 - $<$ €43.500	0.208	0.210	0.220	0.193
$\geq$ €43.500 - $<$ €73.000	0.224	0.203	0.242	0.268
$\geq$ €73.000	0.104	0.159	0.134	0.147
Prefer not to state income	0.264	0.210	0.207	0.206
Obs	125	290	314	306

Pearson: Uncorrected chi2(15) = 9.182
F(15.00, 15510.00) = 0.612, p-value = 0.868

Table 4.A.3: Distribution of participants' sex across waves

	Wave 1	Wave 2	Wave 3	Wave 4
	Prop.	Prop.	Prop.	Prop.
Sex				
Male	0.392	0.510	0.510	0.484
Female	0.608	0.490	0.490	0.516
Obs	125	290	314	306

Pearson: Uncorrected chi2(3) = 5.797
F(3.00, 3102.00) = 1.931, p-value = 0.122

Table 4.A.4: Education levels across waves

	Wave 1	Wave 2	Wave 3	Wave 4
	Prop.	Prop.	Prop.	Prop.
Education Level				
Low Educated	0.160	0.197	0.156	0.105
Middle Educated	0.392	0.472	0.487	0.480
High Educated	0.448	0.331	0.357	0.415
Obs	125	290	314	306

Pearson: Uncorrected chi2(6) = 15.057
F(6.00, 6204.00) = 2.507, p-value = 0.020

Table 4.A.5: House ownership across waves

	Wave 1	Wave 2	Wave 3	Wave 4
	Prop.	Prop.	Prop.	Prop.
Type of Residence				
Homeowner	0.608	0.686	0.701	0.657
Tenant	0.392	0.314	0.299	0.343
Total	1.000	1.000	1.000	1.000
Obs	125	290	314	306

Pearson: Uncorrected chi2(3) = 4.077
F(3.00, 3102.00) = 1.358, p-value = 0.254

4.B Self-Reported Understanding

Table 4.B.1: Self-reported understanding of video instructions

	N	Mean	Median	Min	Max
Video Instructions					
Video CTB	949	8.8	9.0	0.0	10.0
Video MPL Risk	928	8.9	10.0	0.0	10.0
Video MPL Prudence	924	8.4	9.0	0.0	10.0
Video MPL Temperance	922	8.5	9.0	0.0	10.0
Video MPL Ambiguity	924	8.4	9.0	0.0	10.0
Video MPL Time	935	8.8	10.0	0.0	10.0

Notes: Summary statistics of responses to the question (translated from Dutch): "To what extent did you find the video instruction at the start of this section clear?" (0 = completely unclear, 10 = very clear). Missing observations are participants who indicated "Not Applicable".

Table 4.B.2: Self-reported understanding of written instructions

	N	Mean	Median	Min	Max
Written Instructions					
Text CTB	873	8.3	9.0	0.0	10.0
Text MPL Risk	819	8.6	9.0	0.0	10.0
Text MPL Prudence	815	7.9	8.0	0.0	10.0
Text MPL Temperance	809	8.1	8.0	0.0	10.0
Text MPL Ambiguity	813	8.1	8.0	0.0	10.0
Text MPL Time	818	8.5	9.0	0.0	10.0
Text Solidarity Game	1,035	8.1	8.0	0.0	10.0

Notes: Summary statistics of responses to the question (translated from Dutch): "To what extent did you find the written instruction at the start of this section clear?" (0 = completely unclear, 10 = very clear). Missing observations are participants who indicated "Not Applicable".

4.C Histograms Preference Measures Per Wave

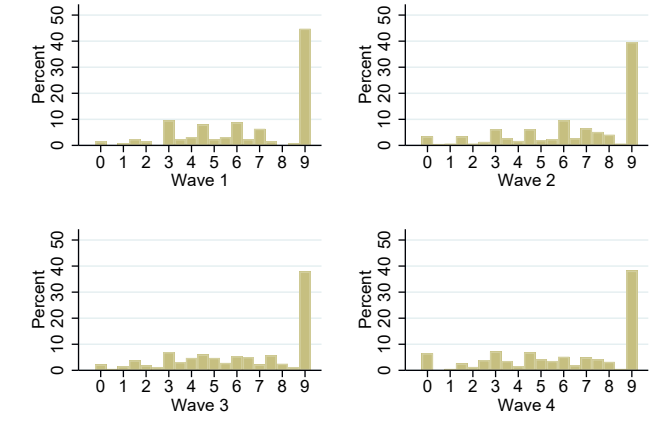


Figure 4.C.1: Histograms MPL Risk

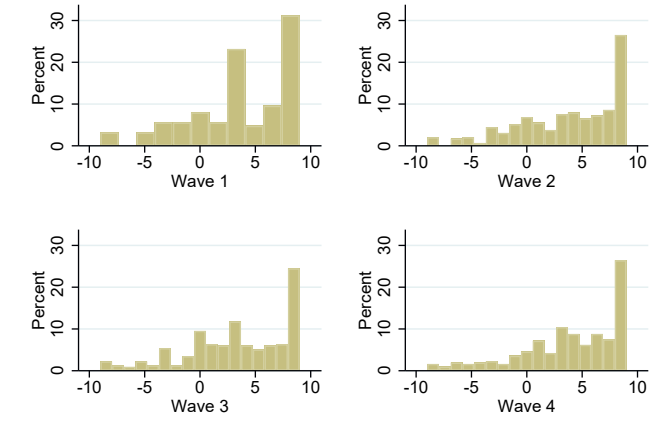


Figure 4.C.2: Histograms CTB Risk

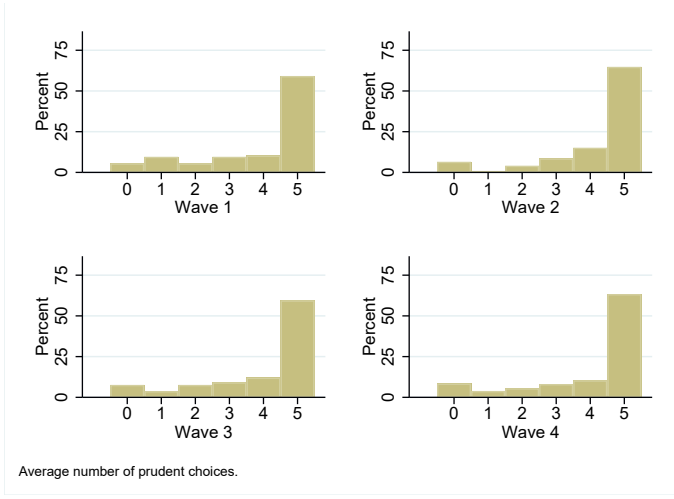


Figure 4.C.3: Histograms MPL Prudence

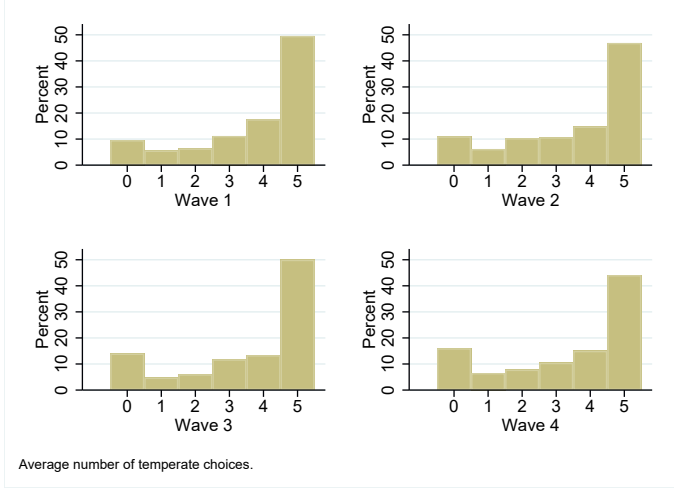
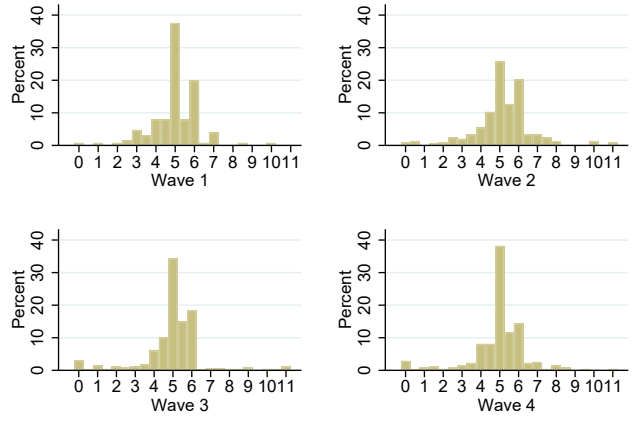
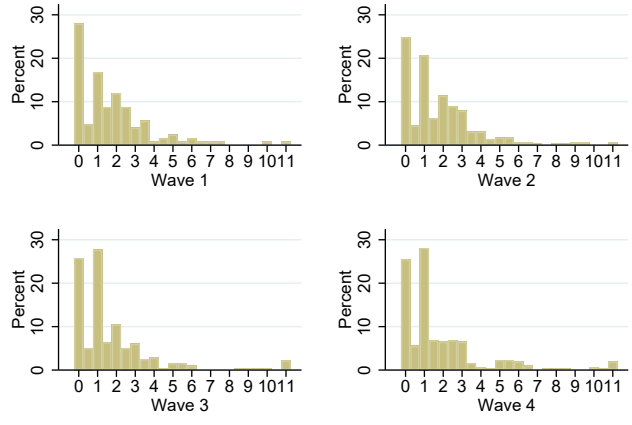


Figure 4.C.4: Histograms MPL Temperance



Average number of risky urn choices.

Figure 4.C.5: Histograms MPL Ambiguity I



Average number of consecutive indifference choices.

Figure 4.C.6: Histograms MPL Ambiguity II

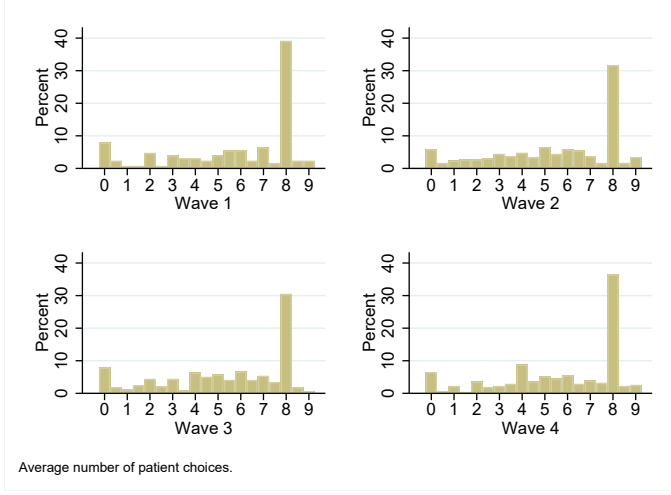


Figure 4.C.7: Histograms MPL Time

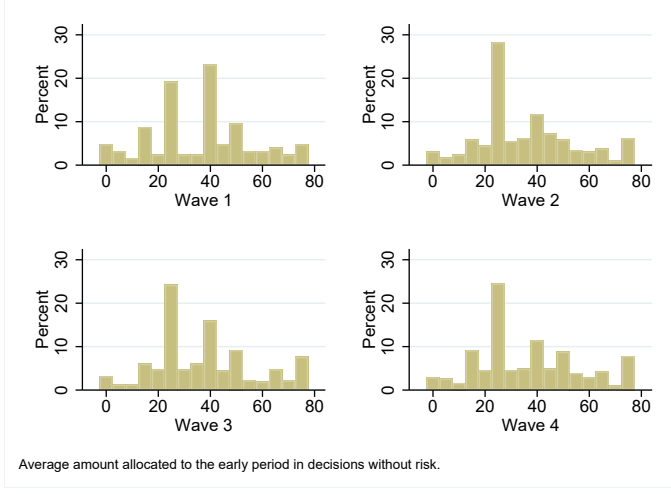


Figure 4.C.8: Histograms CTB Time

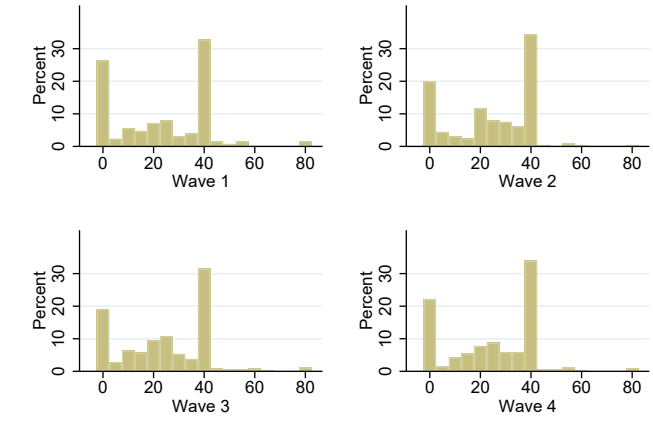


Figure 4.C.9: Histograms Solidarity Game Sent

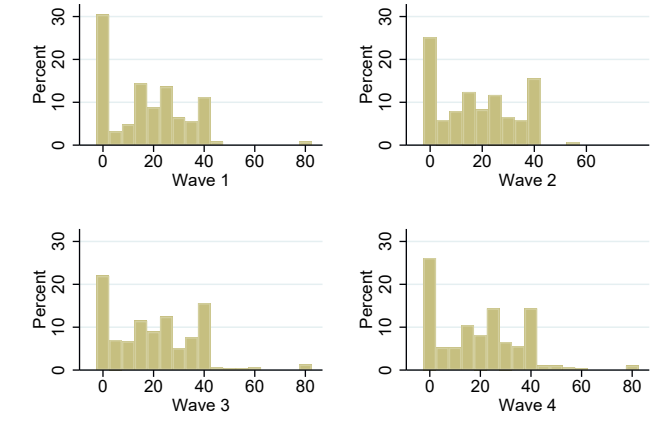


Figure 4.C.10: Histograms Solidarity Game Expected

4.D Full Regressions Heterogeneous Impact

Table 4.D.1: Heterogenous Exposure to the COVID-19 crisis - Full Regression

	Risk and Higher-Order Risk				Time		Ambiguity		Social	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
(i) Health exposure										
Infection	-0.08	0.22	-0.03	0.09	0.01	0.39	-0.11	-0.09	1.15	-0.30
	(0.20)	(0.33)	(0.11)	(0.13)	(0.19)	(1.36)	(0.11)	(0.15)	(1.25)	(1.17)
(ii) Financial Situation										
Worsened	0.41	1.22**	0.36**	-0.20	-0.28	-3.23	0.17	-0.49**	0.12	-1.39
	(0.29)	(0.48)	(0.17)	(0.20)	(0.28)	(1.99)	(0.16)	(0.21)	(1.84)	(1.72)
Improved	-0.48*	-0.51	-0.10	0.17	-0.19	-0.54	0.19	-0.32	-1.62	-1.64
	(0.27)	(0.45)	(0.16)	(0.18)	(0.26)	(1.86)	(0.15)	(0.20)	(1.72)	(1.61)
(iii) Career Perspective										
Worsened	-0.44*	-1.08**	0.09	0.13	-0.08	2.90	-0.06	-0.09	2.78*	1.87
	(0.26)	(0.43)	(0.15)	(0.18)	(0.25)	(1.78)	(0.15)	(0.19)	(1.64)	(1.53)
Improved	-0.27	-0.28	-0.13	-0.05	-0.23	3.11	0.04	-0.13	2.94	3.12
	(0.34)	(0.57)	(0.20)	(0.23)	(0.33)	(2.37)	(0.20)	(0.26)	(2.19)	(2.04)
(iv) Belief Back to Normal										
More than 1 year	0.05	0.18	0.06	0.02	0.22	-0.99	-0.02	-0.01	-0.29	-0.50
	(0.19)	(0.31)	(0.11)	(0.13)	(0.18)	(1.28)	(0.11)	(0.14)	(1.18)	(1.11)
Control Variables										
Female	0.71***	0.59*	-0.03	0.49***	-0.10	-0.33	-0.11	-0.00	0.90	-1.87
	(0.20)	(0.33)	(0.11)	(0.14)	(0.19)	(1.38)	(0.11)	(0.15)	(1.27)	(1.19)
Age	0.04***	0.01	-0.00	0.01	-0.01*	-0.15***	-0.01*	0.01	0.04	-0.10**
	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.05)	(0.00)	(0.01)	(0.05)	(0.05)
Middle Educated	0.58**	0.48	0.34**	-0.12	0.62**	-2.80	-0.26	0.25	-2.28	-2.17
	(0.29)	(0.48)	(0.17)	(0.20)	(0.28)	(2.00)	(0.17)	(0.22)	(1.85)	(1.73)
High Educated	-0.21	0.09	0.30*	-0.36*	0.88***	-1.51	-0.13	-0.00	-3.03	-3.65**
	(0.31)	(0.52)	(0.18)	(0.21)	(0.30)	(2.16)	(0.18)	(0.23)	(1.99)	(1.86)
Tenant	-0.28	-0.08	0.16	-0.03	-0.42**	0.82	0.06	-0.03	-2.14	-1.55
	(0.21)	(0.35)	(0.12)	(0.14)	(0.21)	(1.46)	(0.12)	(0.16)	(1.34)	(1.25)
36.500 euro or more	-0.01	-0.22	0.33**	-0.11	0.08	2.56	0.10	-0.05	0.91	-1.57
	(0.26)	(0.43)	(0.15)	(0.18)	(0.25)	(1.79)	(0.15)	(0.19)	(1.65)	(1.54)
Prefer not to state income	-0.00	-0.16	0.32*	-0.10	0.09	1.23	0.13	-0.01	-0.31	-1.48
	(0.30)	(0.51)	(0.18)	(0.21)	(0.30)	(2.11)	(0.17)	(0.23)	(1.95)	(1.82)
Dominated Choice	0.12	-1.70***	-0.51***	0.03	-0.69***	-6.60***	-0.70***	1.55***	-0.47	1.23
	(0.21)	(0.34)	(0.12)	(0.14)	(0.20)	(1.43)	(0.12)	(0.15)	(1.32)	(1.23)
Constant	4.21***	3.22***	3.73***	3.21***	5.88***	47.86***	5.69***	1.18***	24.02***	28.26***
	(0.59)	(0.97)	(0.34)	(0.40)	(0.57)	(4.05)	(0.33)	(0.44)	(3.74)	(3.49)
Observations	831	831	831	831	831	831	831	831	831	831

Notes: Standard errors in parentheses. (1) Risk (rMPL), (2) Risk (CTB), (3) Prudence, (4) Temperance, (5) Time (tMPL), (6) Time (CTB), (7) Ambiguity Aversion, (8) Consecutive Indiff. (9) Solidarity Sent, (10) Solidarity Expected. Baselevels: Wave 1, Male, Low Educated, Homeowner, Yearly income 36.500 euro or less, did not make dominated choices. Participants from wave 1 and participants that answered 'prefer not to answer' or 'not applicable' in any of the survey questions are excluded. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.E Experimental Design

Convex Time Budget. We implemented two versions of the CTB. Except for the late payout, which was either after 12/16 or 16/24 weeks, the parameters were identical in both versions. Participants made a total of 24 decisions. Table 4.E.1 summarizes the parameters that were used.

Table 4.E.1: CTB Parameters

Set 1								
Task	t	k	a_t	a_{t+k}	p_{t+k}	EV(a_{t+k})	1+r	1+r′
#1	8	12 (16)	€75	€75.00	1	€75.00	1.00	1.00
#2	8	12 (16)	€75	€78.00	1	€78.00	1.04	1.04
#3	8	12 (16)	€75	€87.00	1	€87.00	1.16	1.16
#4	8	12 (16)	€75	€83.40	0.9	€75.00	1.11	1.00
#5	8	12 (16)	€75	€86.70	0.9	€78.00	1.16	1.04
#6	8	12 (16)	€75	€96.60	0.9	€87.00	1.29	1.16
#7	8	12 (16)	€75	€107.10	0.7	€75.00	1.43	1.00
#8	8	12 (16)	€75	€111.45	0.7	€78.00	1.49	1.04
#9	8	12 (16)	€75	€124.35	0.7	€87.00	1.66	1.16
#10	8	12 (16)	€75	€150.00	0.5	€75.00	2.00	1.00
#11	8	12 (16)	€75	€156.00	0.5	€78.00	2.08	1.04
#12	8	12 (16)	€75	€174.00	0.5	€87.00	2.32	1.16

Notes: t=delay period early date in weeks, k=delay period late date in weeks (weeks in parenthesis correspond to version 2), a_t=amount available at the early date, a_{t+k}= amount available at the late date, p_{t+k}=probability that the payment at the late date is actually paid out, EV(a_{t+k})=expected value of the amount available at the late date, 1+r=interest rate over the delay period not adjusted for risk, 1+r′= interest rate over the delay period adjusted for risk. Set 2 is identical, except that k=16 (24).

The decision tasks were presented with information on the dates, probabilities, and possible allocations on one screen, using colors for clarity. Figure 4.E.1 shows an example of such a decision screen. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 4.E.2 shows the screen with instructions and Figure 4.E.3 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

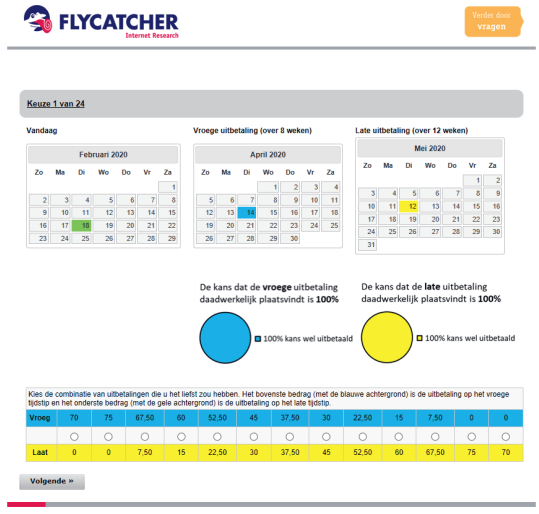


Figure 4.E.1: Example Decision Screen CTB #1, Version 1

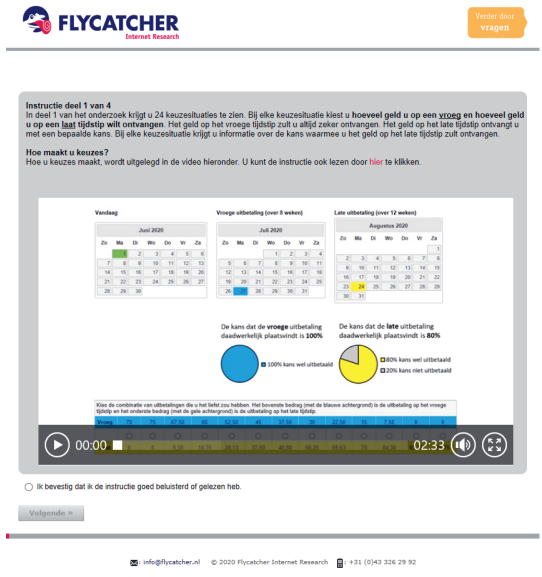


Figure 4.E.2: Instructions Screen CTB

Instructions Part [1/4]

In part 1 of the study, you will be presented with 24 decision situations. In each decision situation, you choose **how much money you want to receive at an "early" and how much money you want to receive at a "late" time**. You will always receive the money at the early time with certainty. You will receive the money at the late time with a certain probability. In each decision situation, you will get information about the probability with which you will receive the money at the late time.

How do you make choices?

How you make choices is explained using the example below. The example shows a decision situation in which you are asked to divide a sum of money between an amount of money at an early time (in this example July 27) and an amount of money at a late time (in this example August 24). The times will be different in the choices you make later.

The calendars indicate times relevant to your choice. Today (June 1 in this example) is highlighted in green. The time of the early payout in each decision situation is exactly 8 weeks from today and is marked in blue. The time of the late payout in this example is 12 weeks from today and is highlighted in yellow. **The time of the late payment may differ between decision situations.**

Below the calendars you will see the probability of actually receiving the money at the late time. In this example, this probability is 80% (i.e. a probability of 8 in 10). **This probability can differ between decision situations.**

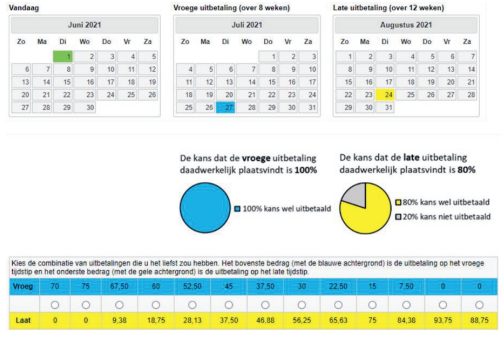
At the bottom of the page you can see the possible divisions of the amount of money in this example. The top amount (with the blue background) shows the amount of money you will receive at the early time. The bottom amount (with the yellow background) shows the amount of money you will receive at the late time with a certain probability.

Explanation of payments in this example. Do you choose:

70 ◉ 0 then you would receive **€70** at the early time (27 July) and receive **€0** at the late time (24 August)

30 ◉ 56,63 then you would receive **€30** at the early time (27 July) and receive **€56,63** at the late time (24 August) and is the probability that you receive the money at the late time 80%.

0 ◉ 93,75 then you would receive **€0** at the early time (27 July) and receive **€93,75** at the late time (24 August) and is the probability that you receive the money at the late time 80%.



Kies de combinatie van uitbetalingen die u het liefst zou hebben. Het bovenste bedrag (met de blauwe achtergrond) is de uitbetaling op het vroege tijdstip en het onderste bedrag (met de gele achtergrond) is de uitbetaling op het late tijdstip.

Vroeg	70	75	67,50	60	52,50	45	37,50	30	22,50	15	7,50	0	0
	○	○	○	○	○	○	○	○	○	○	○	○	○
Laat	0	0	9,38	18,75	28,13	37,50	46,88	56,25	65,63	75	84,38	93,75	88,75

Figure 4.E.3: Written Instructions CTB (Translated from Dutch)

Multiple Price List Time Preferences. We implemented two versions of the tMPLs. Except for the late payout, which was either after 12/16 or 16/24 weeks, the parameters were identical in both versions. Tables 4.E.2 and 4.E.3 show the parameters that were used.

Table 4.E.2: MPL-Time List 1

	Option A		Option B	
	€	Delay Period	€	Delay Period
#1	75	8 weeks	75	12 (16) weeks
#2	75	8 weeks	77	12 (16) weeks
#3	75	8 weeks	79	12 (16) weeks
#4	75	8 weeks	81	12 (16) weeks
#5	75	8 weeks	83	12 (16) weeks
#6	75	8 weeks	85	12 (16) weeks
#7	75	8 weeks	87	12 (16) weeks
#8	75	8 weeks	89	12 (16) weeks
#9	75	8 weeks	91	12 (16) weeks

Notes: Weeks in parenthesis correspond to version 2.

Table 4.E.3: MPL-Time List 2

	Option A		Option B	
	€	Delay Period	€	Delay Period
#1	75	8 weeks	75	16 (24) weeks
#2	75	8 weeks	77	16 (24) weeks
#3	75	8 weeks	79	16 (24) weeks
#4	75	8 weeks	81	16 (24) weeks
#5	75	8 weeks	83	16 (24) weeks
#6	75	8 weeks	85	16 (24) weeks
#7	75	8 weeks	87	16 (24) weeks
#8	75	8 weeks	89	16 (24) weeks
#9	75	8 weeks	91	16 (24) weeks

Notes: Weeks in parenthesis correspond to version 2.

The decision tasks were presented in a list of binary choices with information about the delay period and outcomes. Figure 4.E.4 shows an example of a tMPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 4.E.5 shows the screen with instructions and Figure 4.E.6 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

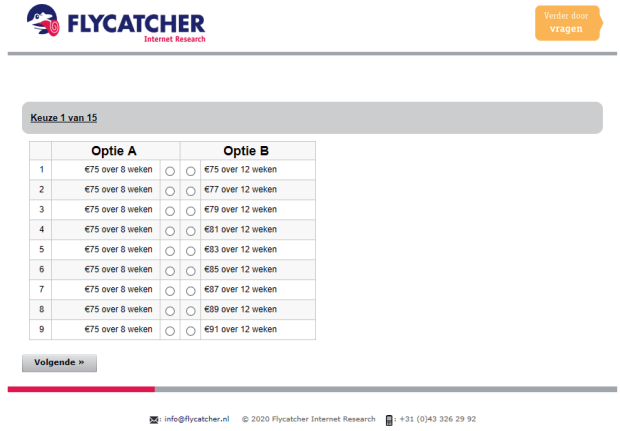


Figure 4.E.4: Example Decision Screen tMPL, Version 1

Figure 4.E.5: Instructions Screen tMPL

Instructions part [1.1/2]

This part consists of two decision situations. In each decision situation you choose between **option A** and **option B**. The options **differ** in the **amount of money** you receive and the **time** when the amount of money is paid out.

How do you make choices?

How you make choices is explained using the example below. The example shows a choice situation in which you are asked to make **9 choices** between option A and option B.

Option A is the same in every row. If you choose option A in this example, you will receive **€50**. This amount will be paid **in 5 weeks**.

Option B differs in each row. If you choose option B in this example, you will receive **€50 or more**. This amount will be paid **in 10 weeks**.

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

	Optie A			Optie B
1	€50 over 5 weken	O	O	€50 over 10 weken
2	€50 over 5 weken	O	O	€51 over 10 weken
3	€50 over 5 weken	O	O	€52 over 10 weken
4	€50 over 5 weken	O	O	€53 over 10 weken
5	€50 over 5 weken	O	O	€54 over 10 weken
6	€50 over 5 weken	O	O	€55 over 10 weken
7	€50 over 5 weken	O	O	€56 over 10 weken
8	€50 over 5 weken	O	O	€57 over 10 weken
9	€50 over 5 weken	O	O	€58 over 10 weken

Figure 4.E.6: Written Instructions tMPL (Translated from Dutch)

Multiple Price List Risk Preferences. Tables 4.E.4 and 4.E.5 show the parameters used for the rMPLs.

Table 4.E.4: MPL-Risk List 1

	Option A			Option B				
	p	€	EV(A)	p	€	p	€	EV(B)
#1	1	74	€74	0.5	40	0.5	120	€80
#2	1	75	€75	0.5	40	0.5	120	€80
#3	1	76	€76	0.5	40	0.5	120	€80
#4	1	77	€77	0.5	40	0.5	120	€80
#5	1	78	€78	0.5	40	0.5	120	€80
#6	1	79	€79	0.5	40	0.5	120	€80
#7	1	80	€80	0.5	40	0.5	120	€80
#8	1	81	€87	0.5	40	0.5	120	€80
#9	1	82	€82	0.5	40	0.5	120	€80

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table 4.E.5: MPL-Risk List 2

	Option A			Option B				
	p	€	EV(A)	p	€	p	€	EV(B)
#1	1	71	€71	0.33	20	0.67	110	€80
#2	1	72.50	€72.50	0.33	20	0.67	110	€80
#3	1	74	€74	0.33	20	0.67	110	€80
#4	1	75.50	€75.50	0.33	20	0.67	110	€80
#5	1	77	€77	0.33	20	0.67	110	€80
#6	1	78.50	€78.50	0.33	20	0.67	110	€80
#7	1	80	€80	0.33	20	0.67	110	€80
#8	1	81.50	€81.50	0.33	20	0.67	110	€80
#9	1	83	€83	0.33	20	0.67	110	€80

Notes: EV(A) and EV(B) list the expected value of the related lottery.

The decision tasks were presented in a list of binary choices with information about the probabilities and outcomes. Figure 4.E.7 shows an example of a rMPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 4.E.8 shows the screen with instructions and Figure 4.E.9 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

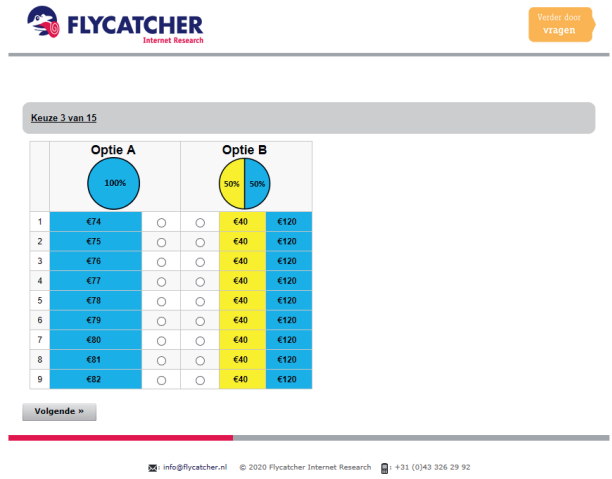


Figure 4.E.7: Example Decision Screen rMPL

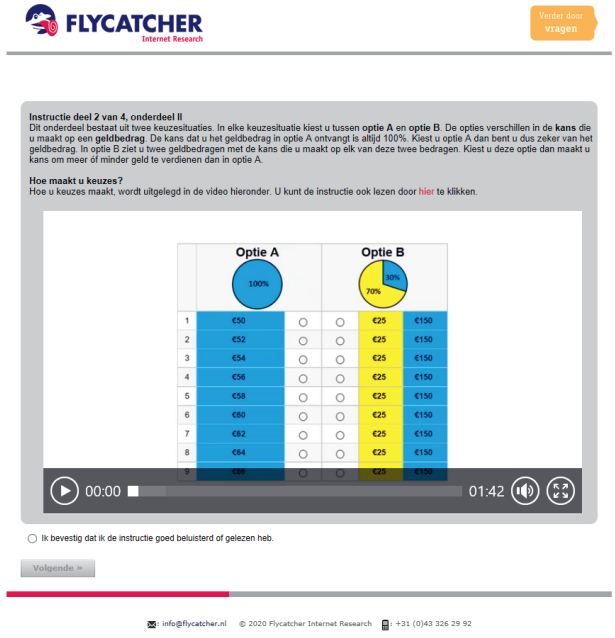


Figure 4.E.8: Instructions Screen rMPL

Instructions part [2.2/4]

This part consists of two decision situations. In each decision situation you choose between **option A** and **option B**. The options differ in the **probability** of receiving an **amount of money**. The probability that you will receive the amount of money in option A is always 100%. If you choose option A, you are therefore certain of the amount of money. In option B you will see two amounts of money with the probabilities of winning each of these two amounts. If you choose this option, you have a chance to earn more or less money than in option A.

How do you make choices?

How you make choices is explained using the example below. The screen shows a decision situation in which you are asked to make **9 choices** between option A and option B.

Option A differs in each row. If you choose option A in this example, you will receive **€50** or more. The chance that this amount will be paid out is shown at the top and is **always 100%**

Option B is the same in every row. In this option you always see two amounts, in this example **€25** and **€150**. If you choose option B, you will receive one of these amounts with a certain probability. This probability is stated above the amounts. In this example, **the probability of receiving $25 is 70%** (i.e. a 7 in 10 chance) and **the probability of receiving $150 is 30%** (i.e. a 3 in 10 chance).

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

	OPTIE A 			OPTIE B 	
1	€50	O	O	€25	€150
2	€52	O	O	€25	€150
3	€54	O	O	€25	€150
4	€56	O	O	€25	€150
5	€58	O	O	€25	€150
6	€60	O	O	€25	€150
7	€62	O	O	€25	€150
8	€64	O	O	€25	€150
9	€66	O	O	€25	€150

Figure 4.E.9: Written Instructions rMPL (Translated from Dutch)

Multiple Price List Prudence. Table 4.E.6 shows the parameters used for the prudence MPLs.

Table 4.E.6: MPL-Prudence

	Option A				Option B			
	p	€	p	€	p	€	p	€
#1	0.5	€90 + [0.5∗€20;0.5∗−€20]	0.5	€60	0.5	€90	0.5	€60 + [0.5∗€20;0.5∗−€20]
#2	0.5	€90 + [0.5∗€10;0.5∗−€10]	0.5	€60	0.5	€90	0.5	€60 + [0.5∗€10;0.5∗−€10]
#3	0.5	€90 + [0.5∗€40;0.5∗−€40]	0.5	€60	0.5	€90	0.5	€60 + [0.5∗€40;0.5∗−€40]
#4	0.5	€135 + [0.5∗€30;0.5∗−€30]	0.5	€90	0.5	€135	0.5	€90 + [0.5∗€30;0.5∗−€30]
#5	0.5	€65 + [0.5∗€20;0.5∗−€20]	0.5	€35	0.5	€65	0.5	€35 + [0.5∗€20;0.5∗−€20]

The decision tasks were presented one by one with information about the probabilities and outcomes. Figure 4.E.10 shows an example of a prudence MPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 4.E.11 shows the screen with instructions and Figure 4.E.12 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

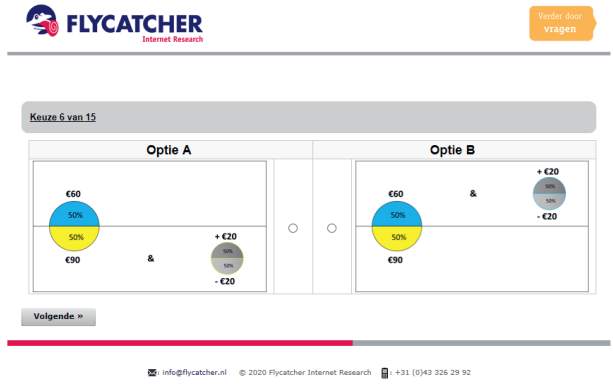


Figure 4.E.10: Example Decision Screen Prudence MPL

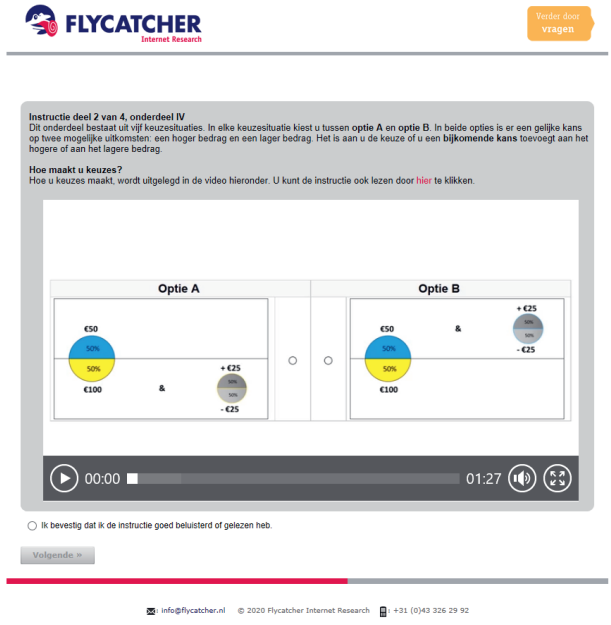


Figure 4.E.11: Instructions Screen Prudence MPL

Instructions part [1.4/2]

This part consists of five decision situations. In each decision situation you choose between **option A** and **option B**. In both options there is an equal chance of two possible outcomes: a higher and a lower amount. In addition, in both options there is an **additional** equal chance that one of the amounts will be higher or lower. In option A, this additional chance is added to the higher amount. In option B, this additional chance is added to the lower amount.

How do you make choices?

How you make choices is explained using the example below. The example shows a decision situation in which you are asked to choose between option A and option B.

In both option A and option B you have an equal chance of receiving a higher or lower amount, in this example €50 or €100.

In both option A and option B there is an **additional** equal chance that one outcome will be higher or lower, in this example €25 higher or €25 lower. The difference is that option A has the **additional** chance added to the higher amount, while option B has the **additional** chance added to the lower amount.

You can make your choice by clicking on one of the radio buttons.

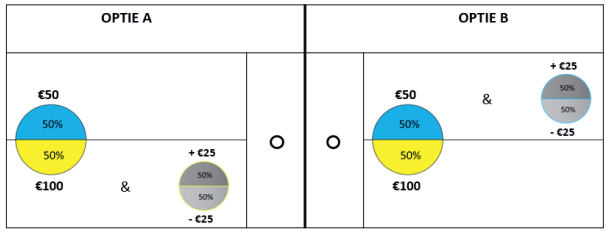


Figure 4.E.12: Written Instructions Prudence MPL (Translated from Dutch)

Multiple Price List Temperance. Table 4.E.7 shows the parameters used for the temperance MPLs.

Table 4.E.7: MPL-Temperance

	Option A				Option B			
	p	€	p	€	p	€	p	€
#1	0.5	€90 + [0.5∗€30;0.5∗−€30]	0.5	€90 + [0.5∗€30;0.5∗−€30]	0.5	€90	0.5	€90 + [0.5∗€30;0.5∗−€30] + [0.5∗€30;0.5∗−€30]
#2	0.5	€90 + [0.5∗€30;0.5∗−€30]	0.5	€90 [0.5∗€10;0.5∗−€10]	0.5	€90	0.5	€90 + [0.5∗€30;0.5∗−€30] + [0.5∗€10;0.5∗−€10]
#3	0.5	€90 + [0.5∗€30;0.5∗−€30]	0.5	€90 [0.5∗€50;0.5∗−€50]	0.5	€90	0.5	€90 + [0.5∗€30;0.5∗−€30] + [0.5∗€50;0.5∗−€50]
#4	0.5	€30 + [0.5∗€10;0.5∗−€10]	0.5	€30 [0.5∗€10;0.5∗−€10]	0.5	€30	0.5	€30 + [0.5∗€10;0.5∗−€10] + [0.5∗€10;0.5∗−€10]
#5	0.5	€70 + [0.5∗€30;0.5∗−€30]	0.5	€70 [0.5∗€30;0.5∗−€30]	0.5	€70	0.5	€70 + [0.5∗€30;0.5∗−€30] + [0.5∗€30;0.5∗−€30]

The decision tasks were presented one by one with information about the probabilities and outcomes. Figure 4.E.13 shows an example of a prudence MPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 4.E.14 shows the screen with instructions and Figure 4.E.15 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

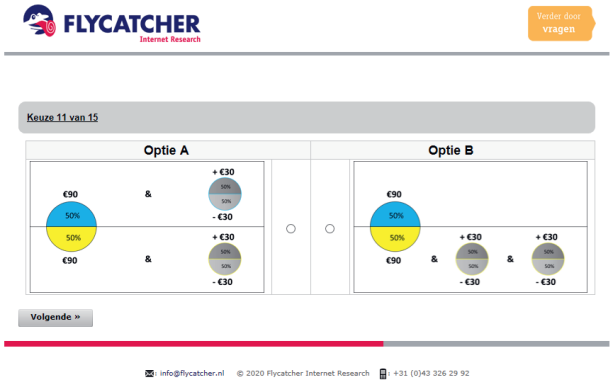


Figure 4.E.13: Example Decision Screen Temperance MPL

Figure 4.E.14: Instructions Screen Temperance MPL

Instructions part [1.5/2]

This part consists of five decision situations. In each decision situation you choose between **option A** and **option B**. In both options there is an equal chance of two possible outcomes. In addition, there is **twice** an **additional** equal chance that an outcome will be higher or lower. In option A, these additional probabilities are split. In option B, these additional chances are added to the same amount.

How do you make choices?

How you make choices is explained using the example below. The example shows a decision situation in which you are asked to make a choice between option A and option B.

In both option A and option B you have an equal chance of winning an amount, in this example €100.

In both option A and option B there is **twice** an **additional** equal chance that one outcome will be higher or lower, in this example €25 higher or €25 lower. The difference is that with option A the **additional** odds are split, while with option B the **additional** odds are added to the same amount.

You can make your choice by clicking on one of the radio buttons.

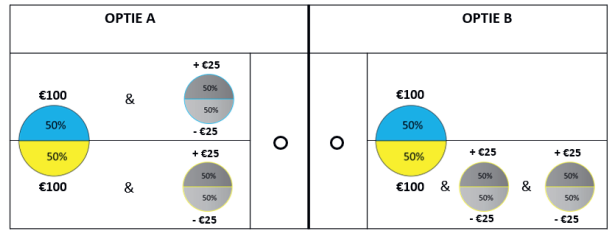


Figure 4.E.15: Written Instructions Temperance MPL (Translated from Dutch)

Multiple Price List Ambiguity. Table 4.E.8 shows the parameters used for the aMPLs.

Table 4.E.8: MPL-Ambiguity

	Option A Urn A composition (balls)	Indifference	Option B Urn B composition (balls)
#1	10 red ; 0 blue	0.5∗option A ; 0.5∗option B	Unknown
#2	9 red ; 1 blue	0.5∗option A ; 0.5∗option B	Unknown
#3	8 red ; 2 blue	0.5∗option A ; 0.5∗option B	Unknown
#4	7 red ; 3 blue	0.5∗option A ; 0.5∗option B	Unknown
#5	6 red ; 4 blue	0.5∗option A ; 0.5∗option B	Unknown
#6	5 red ; 5 blue	0.5∗option A ; 0.5∗option B	Unknown
#7	4 red ; 6 blue	0.5∗option A ; 0.5∗option B	Unknown
#8	3 red ; 7 blue	0.5∗option A ; 0.5∗option B	Unknown
#9	2 red ; 8 blue	0.5∗option A ; 0.5∗option B	Unknown
#10	1 red ; 9 blue	0.5∗option A ; 0.5∗option B	Unknown
#11	0 red ; 10 blue	0.5∗option A ; 0.5∗option B	Unknown

Notes: Participants received this MPL twice. In the first list, they were informed that the winning color was red and in the second list, they were informed that the winning color was blue. Participants were also informed that the proportion of red and blue balls in the ambiguous urn stayed the same within each and between both MPLs.

The decision tasks were presented in a list of binary choices with information about the urn composition. Figure 4.E.16 shows an example of an ambiguity MPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure 4.E.17 shows the screen with instructions and Figure 4.E.18 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

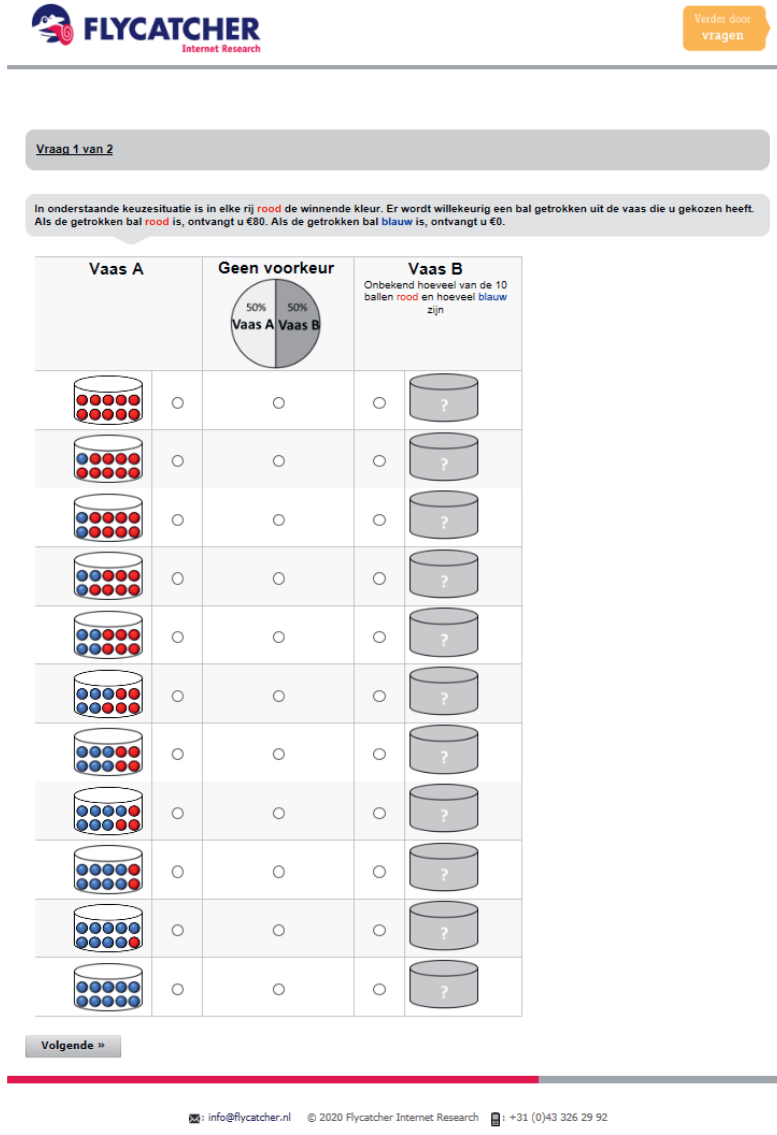


Figure 4.E.16: Example Decision Screen aMPL

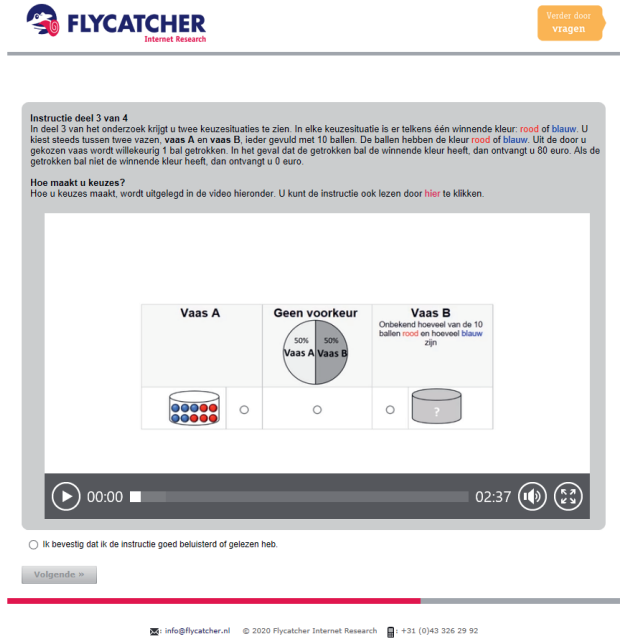
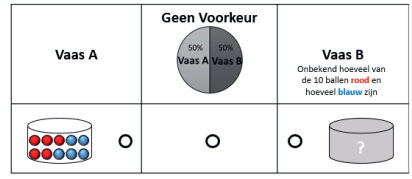


Figure 4.E.17: Instructions Screen aMPL

Instructions Part [2/4]

In part 2 of the study, you will be presented with two decision situations. In each decision situation there is always one winning color: **red** or **blue**. You always choose between two urns, **urn A** and **urn B**, each filled with 10 balls. The balls have the color **red** or **blue**. 1 ball is randomly drawn from the urn you have chosen. In case the drawn ball has the winning color, you receive 80 euros. If the drawn ball is not the winning color, you receive 0 euros.



Urn A is transparent: in each choice you can see **exactly** how many of the 10 balls are red and how many are blue. In this example, there are 5 red and 5 blue balls in urn A.

Urn B is opaque: you **do not** know how many of the 10 balls are red and how many are blue. A computer determines the ratio of red and blue balls in urn B once by chance. This could be 10 red balls, 10 blue balls, or anything in between.

The decision situations differ in the number of red and blue balls in urn A. **The content of urn B remains the same for all choices.**

The number of balls of a certain color in a urn determines the probability of choosing this color by a random draw. In this example, there are 5 red and 5 blue balls in the urn. Thus, in a random draw, the probability of getting a red ball is 5 in 10 (i.e. 50%). The chance of getting a blue ball is also 5 in 10 (i.e. 50%).

Your choices

In the choices you are going to make you will be asked to choose between urn A and urn B. You also have the option to choose the option "No Preference". If you choose "No Preference" then the computer will determine by chance (50-50% chance) which urn is chosen.

Figure 4.E.18: Written Instructions aMPL (Translated from Dutch)

Solidarity Game. For the solidarity game, participants only received written instructions. Figure 4.E.19 shows the screen with instructions and Figure 4.E.20 shows the decision screen as presented to participants.

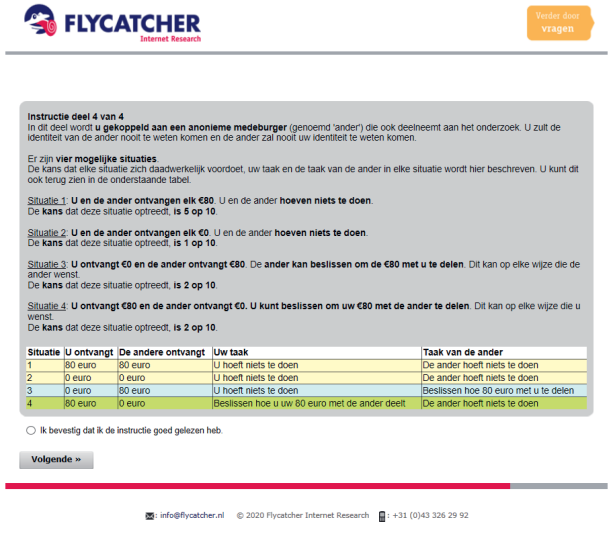


Figure 4.E.19: Instructions Screen Solidarity Game

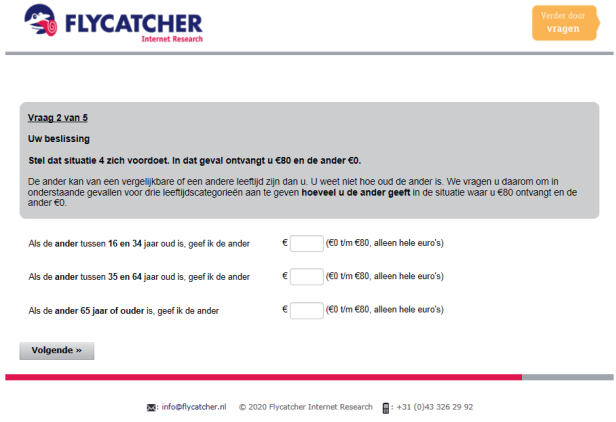


Figure 4.E.20: Decision Screen Solidarity Game

5

A Comparison of Dutch Self-Employed Workers and Employees

Adapted from: Bokern, P., Linde, J., Riedl, A., Schmeets, H., & Werner, P. (2022a). A comparison of pension relevant preferences, traits, skills, and attitudes between the Dutch self-employed and employees. *Netspar Design Paper*, *216*.

Abstract

We compare self-employed workers and employees on their preferences and traits. To this end, we implemented a survey, including incentivized economic experiments, among the Dutch working population ($N = 4,282$). Data from the survey are enriched with demographic variables from register data by Statistics Netherlands. Our data contain a rich set of preferences and traits, including economic preferences, social preferences, personality traits, and cognitive traits, which allows us to provide an extensive picture of the differences between the two groups. Additionally, we measure preferences with both incentivized economic experiments and self-assessed survey questions, which allows us to compare these different elicitation methods. We find that self-employed workers are more willing to take risks, more patient, more optimistic, and more willing to reciprocate negatively, compared to employees. They also have lower financial management skills and report lower trust in institutions and higher trust in other people. Results from incentivized experiments are largely in line with the results from survey questions for risk and social preferences, but contrasting results are found for time preferences with self-employed workers making less patient choices. Self-employed workers do not differ on average from employees in other preferences and traits, such as self-control, financial literacy, ambiguity aversion, and overconfidence.

5.1 Introduction

The average share of self-employed workers has remained roughly stable across the European Union over the past two decades (at around 15%). At the same time, the composition of the group of self-employed is continuously changing (Cowling et al., 2019; Eurofound, 2017).[1] For example, the share of self-employed workers without personnel (solo self-employed) increased, especially in the services and public sector, while the share of self-employed workers in agriculture decreased (Eurofound, 2017). Regarding demographic composition, there has been a decrease in the gender gap and self-employed workers are becoming older on average (Cowling et al., 2019).

Given that the labor market is constantly changing and the individuals who comprise the group of self-employed vary across countries and time, several authors have called for the need to keep research on self-employment up-to-date and test "established" relationships (Cowling et al., 2019; Simoes et al., 2016). Accordingly, we build on previous work posing the question "Who are the self-employed?" (e.g., Beugelsdijk and Noorderhaven, 2005; Cowling, 2000; Cowling et al., 2019; Simoes et al., 2016; Walter and Heinrichs, 2015). We examine differences between self-employed workers and employees on a wide variety of preferences and traits, including economic preferences, social preferences, personality traits, and cognitive traits. To this end, we implemented a survey, including incentivized economic experiments, among the Dutch working population ($N = 4,282$).

Having an accurate picture of who the self-employed are is important because businesses ultimately arise from the actions of individuals (Baron, 2004). The entrepreneurial process involves, for example, operating in complex environments (Baron, 2004), bearing risks (Ekelund et al., 2005), and believing in the feasibility and successfulness of business ideas (Frese & Gielnik, 2014; Koellinger et al., 2007). Consequently, it may be expected that cognitive traits, risk preferences, and optimism are characteristics that play a role in the decision to become self-employed. In this chapter, we empirically examine these and other characteristics of the Dutch self-employed and investigate how they compare to employees.

A better understanding of the self-employed and how they compare to employees also provides insights that can aid adequate policy-making. For example, risk and time preferences have been shown to correlate with invest-

[1] The OECD (2023) defines self-employment as "the employment of employers, workers who work for themselves, members of producers' co-operatives, and unpaid family workers."

ment (e.g., Beauchamp et al., 2017; Dohmen et al., 2011; Menkhoff and Sakha, 2017) and saving decisions (e.g., Falk et al., 2018; Sutter et al., 2013), respectively. Insights into such characteristics, therefore, allow for more targeted policies that incorporate differences as well as similarities between employees and self-employed workers. This is particularly relevant in recent years as self-employed workers have been in the spotlight of policy debate, mainly due to the changing composition of the group of self-employed (Eurofound, 2017). The past years have, for instance, seen an increase in the number of solo self-employed who are similar to employees regarding the labor, knowledge, and skills they offer, but often lack the social and employment protection that employees enjoy. If those solo self-employed are also similar to employees in their preferences and traits this can be taken into account for policies that target this group.

The contribution of our study is that we explore a rich set of preferences and traits within the same large and heterogeneous population sample, including economic preferences (risk, higher-order risk, ambiguity aversion, and time), social preferences (solidarity, altruism, and reciprocity), personality traits (self-control, procrastination, trust, overconfidence, and optimism), and cognitive traits (financial literacy, financial management, and cognitive reflection). This allows us to provide an extensive picture of the differences between self-employed workers and employees in their preferences and traits. In addition, we measure several economic and social preferences with both incentivized economic experiments, where decisions have real financial consequences (revealed preference methods), and self-assessed survey questions (stated preference methods). This allows us to investigate whether we find consistency between people's behavior in incentivized economic experiments and their own self-assessed preferences.

We find that self-employed workers are more willing to take risks, more patient, and more optimistic, compared to employees. They are also more willing to reciprocate negatively, have lower trust in institutions, have higher trust in other people, and report lower financial management skills. In the incentivized tasks, self-employed workers take slightly more risks, exhibit slightly more solidarity, and are less patient than employees. Self-assessed preferences and behavior in incentivized tasks largely coincide when it comes to risk and social preferences but diverge for time preferences. Compared to employees, self-employed workers also indicate that they have more self-control, state to be more altruistic, and score higher on cognitive reflection and financial literacy. However, these effects are not robust to adding demographic control variables. Self-employed workers do not differ from em-

ployees regarding prudence, temperance, ambiguity aversion, procrastination, positive reciprocity, and overconfidence.

The remainder of this chapter is structured as follows. In Section 5.2, we discuss the implementation of our study. Section 5.3 is divided into subsections covering a set of related preferences and traits. Each subsection includes a motivation for including these preferences and traits, related literature, the experimental/survey design, and results. In Section 5.4, we discuss the results and conclude.

5.2 Procedures

The data were collected in a two-wave online survey in May and June of 2020 conducted in collaboration with Statistics Netherlands and research agency Flycatcher.[2] Statistics Netherlands selected the stratified random sample, which allowed us to link the survey and experimental data with register data. Flycatcher programmed the online survey and experiments and collected the data. A total of 18,000 Dutch employees and 18,000 self-employed were randomly selected and invited through physical letters to participate in the online study (see Appendix 5.B). In total, 4,282 Dutch residents completed both waves. Data from the survey are enriched with demographic variables from register data of Statistics Netherlands.

Using the register data, we classify individuals according to their occupation status. We identify 2,397 (56%) as employed, 1,505 (35%) as self-employed, and 380 (9%) as other (e.g., student, retiree, unemployed).[3] In the analysis, we exclude participants classified as other because they are neither employed nor self-employed, leaving 3,902 individuals.

The two waves of the survey included different sets of incentivized elicitation tasks, which are explained in detail in the next section. One out of five participants, among those who completed both waves, was randomly selected to receive a payment based on their decisions in one randomly selected incentivized task. In addition, one iPad was raffled off among those participants who completed both waves. Possible earnings ranged from €0 up to €186 depending on the task. The average earning among the participants selected for

[2] A complete overview of the material is available at http://bit.ly/pbbs-main.

[3] Some individuals are classified as "other" because the drawing of the sample and the survey did not take place exactly at the same time.

payment was €77.10 ($SD = 41.33$).[4] The median completion time was 46 and 51 minutes respectively in waves 1 and 2. Participants were fully informed about these procedures in advance.

5.3 Design and Results

We first report demographic characteristics of our sample and their relationship with self-employment. Thereafter, each subsection investigates differences between self-employed workers and employees for a set of related preferences and/or traits. We follow the same structure in each subsection. In particular, we (i) provide motivation for investigating the relationship between self-employment and the respective set of preferences and/or traits, (ii) summarize related literature, (iii) describe the survey and/or experimental design, and (iv) discuss the key findings related to that specific aspect of our study.[5] The analysis in each subsection consists of descriptive results by means of cumulative distribution plots, non-parametric Mann-Whitney U (MWU) tests, and parametric analysis in the form of Ordinary Least Squares (OLS) regression analyses, both with and without controls. The dependent variables in the regressions are standardized (z-score) for the sake of interpretability.[6]

5.3.1 Basic Demographic Characteristics

There are a number of studies that investigate the role of basic demographic characteristics and their relationship with self-employment (Simoes et al., 2016 provide an extensive review). In terms of relevant basic demographic characteristics for self-employment, Simoes et al. (2016) discuss sex, age, marital status, having children, education, migration background, and access to financial resources. We report descriptive statistics of these demographic

[4] Participants thus earned €15.42 on average. At the time of the study, this was roughly 50% above the net hourly minimum wage in the Netherlands (it was €9.70 per hour for a 40-hour workweek in 2020, see https://bit.ly/wage-Dutch, last retrieved May 2023).

[5] In our literature review, we broadly consider related studies that investigate the characteristics of self-employed workers. Not all studies compare self-employed workers with employees and hence not all results are directly comparable. Providing a broad overview of the literature, however, will provide insight into the relationship that we can expect to find.

[6] Except generalized trust because it is a dichotomous variable.

characteristics for our sample in Table 5.3.1 and investigate differences between employees and self-employed workers with regression analyses presented in Table 5.3.2.

For sex, it is consistently found that men are more likely to be self-employed than women (e.g., Koellinger et al., 2013; Leoni and Falk, 2010; Stefanović and Stošić, 2012; Verheul et al., 2012) and we find a similar relationship in our sample ($p < 0.001$). The relationship between age and self-employment is found to exhibit an inverted U-shaped pattern in several longitudinal studies, meaning that people are more likely to become self-employed with increasing age but that the effect reverses at a certain point (Blanchflower, 2004; Caliendo et al., 2014; Georgellis et al., 2005). We similarly find an inverted U-shaped pattern for age (the joint significance test of age and age-squared yields $p < 0.001$). For marital status, the majority of studies document a positive relationship between being self-employed and being married (e.g., Ahn, 2010; Eliasson and Westlund, 2013; Özcan, 2011). In our sample, self-employed workers are somewhat more likely to be married compared to employees (63% vs 55%), but the effect is not statistically significant ($p = 0.207$) in the regression. Concerning having children, there is some evidence that having young children relates positively with self-employment (Lin et al., 2000; Wellington, 2006). We find that self-employed workers in our sample are more likely to have children than employees (74% vs 63%), but the difference is not statistically significant ($p = 0.628$) in the regression.

Empirical results on the role of education and its relationship with self-employment are ambiguous. Previous studies suggest a positive relationship (e.g., Bates, 1995; Kim et al., 2006), a negative relationship (e.g., Bruce, 1999; K. Clark and Drinkwater, 2000), no relationship (Block and Wagner, 2010; Van Der Sluis et al., 2008), or a U-shaped relationship, meaning that both individuals with low and high levels of education are more likely to become self-employed than those with an intermediate education level (Poschke, 2013). A possible explanation for these contradicting results is that the results depend on the country of investigation (Blanchflower, 2004; Cowling, 2000). We find no effect of education in our sample both for middle-educated ($p = 0.674$) and higher-educated ($p = 0.530$), compared to lower-educated individuals.[7]

For migration background, Simoes et al. (2016) report that the above-average

[7] The education data from CBS is unfortunately incomplete, which we capture with the category "Unknown" in the regressions. Specifically, the education level is missing for 1,128 participants (26% of our sample).

Table 5.3.1: Descriptive Statistics - Demographics

	Full Sample Mean (SD)	Employees Mean (SD)	Self-Employed Mean (SD)	Min	Max
Sex	0.43	0.45	0.39	0	1
Age	46.52	44.38	49.93	20	87
	(11.68)	(11.95)	(10.36)		
Marital Status (=Single)	0.33	0.37	0.27	0	1
Marital Status (=Married)	0.58	0.55	0.63	0	1
Marital Status (=Widowed)	0.01	0.01	0.01	0	1
Marital Status (=Divorced)	0.08	0.08	0.09	0	1
Children (=Yes)	0.67	0.63	0.74	0	1
Education Level (=Low)	0.04	0.04	0.04	0	1
Education Level (=Middle)	0.25	0.26	0.22	0	1
Education Level (=High)	0.46	0.46	0.44	0	1
Education Level (=Unknown)	0.25	0.23	0.29	0	1
Migration Background (1=Native)	0.87	0.87	0.87	0	1
Household Wealth	367,168	231,201	583,629	-949,069	13,662,027
	(716,687)	(464,927)	(954,652)		
Household Income	45,051	42,646	48,881	-23,839	4,844,076
	(83,314)	(99,879)	(45,710)		

Notes: Data refers to January 1, 2020 (for the variables marital status, children, education level, household wealth, and household income) or to the date on which the participant filled in the first wave of the survey (for the variable age). Marital status (=married) includes registered partnership. Household income refers to spendable income and is adjusted for the size and composition of the household. Household wealth and income may be negative for self-employed individuals who incurred losses with their business. The sample size is $N = 3,902$ for the entire sample, $N = 2,397$ for the sample of employees, and $N = 1,505$ for the sample of self-employed workers. There is one observation missing for household wealth and income.

likelihood of immigrants to become self-employed is a "widely accepted and studied fact" (p. 793). This positive relationship between self-employment and migration background has for instance been documented in the United States for foreign-born individuals (Fairchild, 2009) and in Sweden for non-Western immigrants (Andersson and Hammarstedt, 2011; Joona, 2010). It is important to note, however, that the majority of these studies (and the studies cited therein) are country-specific and report data from the year 2000 or earlier. The relationship observed may be specific to the country or to the period of investigation (Naudé et al., 2017). A recent report by OECD/European Commission (2021), for example, shows that the majority of European countries either have higher self-employment rates among natives or similar rates between natives and immigrants. For the Netherlands, the report shows little difference in the percentage of self-employed people among natives and non-natives in the Netherlands. In line with this, we find no relationship between self-employment and migration background ($p = 0.291$).

Lastly, empirical evidence suggests that there is a positive relationship be-

Table 5.3.2: Self-Employment and Basic Characteristics

	Self-Employed (y/n)
Sex (=Female)	-0.05***
	(0.01)
Age	0.03***
	(0.01)
Age Squared	-0.00***
	(0.00)
Marital Status (=Married)	-0.02
	(0.02)
Marital Status (=Widowed)	-0.15
	(0.08)
Marital Status (=Divorced)	0.02
	(0.03)
Children (=Yes)	0.01
	(0.02)
Education Level (=Middle)	-0.01
	(0.04)
Education Level (=High)	-0.02
	(0.04)
Education Level (=Unknown)	-0.03
	(0.04)
Migration Background (=Native)	-0.02
	(0.02)
Household Wealth (Quintile=1)	-0.09***
	(0.02)
Household Wealth (Quintile=2)	-0.06*
	(0.02)
Household Wealth (Quintile=4)	0.14***
	(0.02)
Household Wealth (Quintile=5)	0.27***
	(0.03)
Household Income (Quintile=1)	0.17***
	(0.02)
Household Income (Quintile=2)	0.05*
	(0.02)
Household Income (Quintile=4)	-0.00
	(0.02)
Household Income (Quintile=5)	0.10***
	(0.02)
Constant	-0.34**
	(0.12)
Observations	3901
Adjusted R^2	0.131

Notes: Robust standard errors in parentheses. Baselevels: Sex (=Male), Marital Status (=Single), Children (=No), Education Level (=Low), Migration Background (=Non-Native), Household Wealth (Quintile=3), Household Income (Quintile=3). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

tween entry to self-employment and household wealth (e.g., Johansson, 2000; Fairlie and Krashinsky, 2012). The main argument is that individuals with higher wealth can use their own capital when starting a business and are more likely to receive external funding because they have more collateral (Simoes et al., 2016). Our data does not allow us to make any causal statements, however, we similarly find that, compared to individuals in the middle quintile, those in the first and second quintiles are less likely to be self-employed, while those in the fourth and fifth quintiles are more likely to be self-employed. Regarding income, we find a U-shaped pattern, meaning that those in the lowest quintile (1) and highest quintile (5) are most likely to be self-employed.

5.3.2 Risk Preferences and Ambiguity Aversion

It is often assumed that self-employed workers bear more risk than employees, for example, because the earnings of self-employed generally have higher variance (Ekelund et al., 2005). Consequently, the relationship between risk preferences and self-employment has been studied extensively. A number of studies find a negative relationship between self-employment and risk aversion (e.g., Ahn, 2010; Brown et al., 2011; Dohmen et al., 2011; Ekelund et al., 2005). At the same time, there is research suggesting that this relationship is more nuanced as results may depend on the measure that is used (e.g., Åstebro et al., 2007; Georgalos, 2018; Hamböck et al., 2017). For example, in a sample of Dutch entrepreneurs, managers, and employees, Koudstaal et al. (2016) find that, while entrepreneurs view themselves as less risk-averse than others, they do not make less risk-averse choices than managers in incentivized choice tasks. Charness et al. (2020) do not find any relationship between risk aversion and self-employment for five different measures of risk aversion, including one hypothetical question and four different incentivized choice tasks in a sample of the Dutch population.

Research on the relationship between higher-order risk preferences (prudence and temperance) and self-employment is limited. Prudence can be interpreted as downside risk aversion, which implies precautionary saving (Kimball, 1990). A prudent individual, therefore, prefers to increase their savings with an increase in background risk. Temperance concerns the relationship between portfolio risk and background risk (Kimball, 1993). A temperate individual will take less investment risk when background risk increases. Noussair et al. (2014) elicit higher-order risk preferences in the Netherlands and do not find any relationship with self-employment.

Individuals who start and run their own businesses also face substantial ambiguity. Therefore, it has been hypothesized that self-employed workers are less averse to ambiguity. The empirical evidence is mixed, however. Some studies find a negative relationship between self-assessed ambiguity aversion and self-employment (Begley and Boyd, 1987; Chye Koh, 1996; Schere, 1982), while others find no such relationship (Babb and Babb, 1992). More recent studies investigate the relationship between self-employment and ambiguity aversion using incentivized experiments and report no differences between self-employed workers and a control group (Holm et al., 2013; Koudstaal et al., 2016).

Method. We elicited risk preferences using both incentivized experimental measures and survey questions. Higher-order risk preferences and ambiguity aversion were elicited with incentivized experimental measures only.

We included two incentivized experimental measures for risk preferences. First, we implemented an adapted version of the convex time budget (CTB; Andreoni and Sprenger, 2012a; Potters et al., 2016), which jointly elicits risk and time preferences. In this measure, participants face 24 decision tasks where they are asked to divide a budget of €75 between an earlier date, 8 weeks from the day of participation, and a later date, either 16 weeks or 24 weeks from the day of participation. The decisions differ from each other in terms of the interest that is paid out for waiting longer and the risk that is involved. The element of risk is introduced by making allocations to the later date uncertain in some decision tasks (it was paid with a 100%, 90%, 70%, or 50% chance depending on the task). We use a simple count measure to infer risk preferences from decisions. Specifically, we focus on tasks that involve risk and classify each decision the participant makes as risk-averse (RA), risk-neutral (RN), or risk-seeking (RS). An aggregate measure is then created by counting the number of decisions classified as RA (with weight=-1), RN (with weight=0), and RS (with weight=1) separately for the two different time periods (i.e., 16 weeks or 24 weeks) and taking the average. Larger values of this variable are thus associated with a higher willingness to take risks in the experiment.

Second, we implemented five different multiple price lists (MPLs) in the tradition of Holt and Laury (2002).[8] An MPL is a list of binary decision situa-

[8]We implemented three different types of MPLs: (i) two MPLs where participants choose between two non-degenerate lotteries with probabilities that are varied when moving down the list and outcomes that stay constant within each list (e.g., Holt and Laury, 2002), (ii) two

tions. In the case of risk preferences, participants are asked to choose between a safer and riskier lottery in each decision situation. The list is designed such that either the safer or the riskier lottery becomes more attractive when moving down the list. The point where the participant switches to the option that becomes more attractive provides an indication of the risk preference. In this study, participants made ten choices in each MPL. We take the average number of risky lottery choices over all five MPLs as a measure of risk preference. Larger values of this variable are thus associated with a higher willingness to take risks in the experiment.

The self-reported survey questions for risk preferences are based on the work by Dohmen et al. (2011). Participants self-identify as being more or less willing to take risks on an 11-point Likert-scale from "not at all willing to take risks" (0) to "very willing to take risk" (10) either in general (GRQ), or in specific domains. The specific domains include willingness to take risks in their personal finances (FRQ), occupation (CRQ), and health (HRQ). We asked these questions in both waves of the study and average the response for our analysis.

Higher-order risk preferences were elicited using an incentivized experimental measure developed by Noussair et al. (2014). Prudence was elicited with five binary decision situations. In each decision situation, participants receive a lottery that yields a high or a low outcome with equal probability. Participants are then asked to choose whether they want to add a zero-mean lottery to the state of high wealth or to the state of low wealth. Prudent decision-makers prefer to add the lottery to the state of high wealth. Temperance was elicited with another five binary decision situations. In this case, participants receive a lottery that yields the same outcome with equal probability. Participants are then asked to choose whether they want to aggregate or disaggregate two identical zero-mean lotteries. Temperate decision-makers prefer disaggregation of the lotteries. We take the number of prudent (temperate) choices as a measure of prudence (temperance).

Ambiguity aversion was elicited using an incentivized experimental measure consisting of two MPLs, following Cettolin and Riedl (2019). In both MPLs, participants face eleven decision situations, where they are asked to choose

MPLs where participants choose between one degenerate lottery with outcomes that are varied when moving down the list and one non-degenerate lottery with constant probabilities and outcomes (e.g., M. Cohen et al., 1987), (iii) one MPL where participants choose between two non-degenerate lotteries with constant probabilities and one outcome is varied when moving down the list (e.g., Drichoutis and Lusk, 2016). In Chapter 2, we show that correlations between these measures range from .60 to .88 when controlling for measurement error.

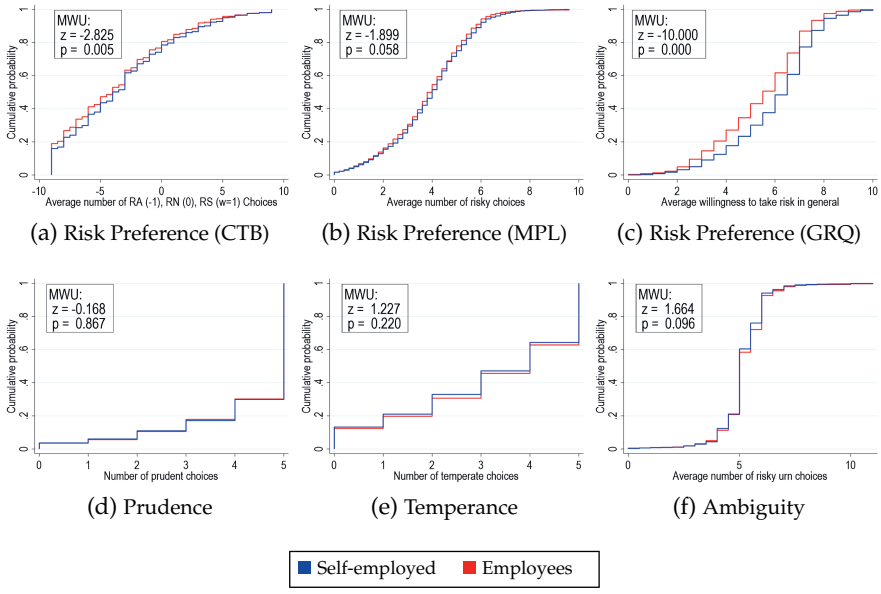
between a risky lottery with known probabilities of winning and an ambiguous lottery with unknown probabilities of winning. In addition, participants can state indifference between both lotteries, in which case a fair random device chooses between the options for them. The probabilities in the lotteries are displayed on a screen with red and blue balls in urns. The urn representing the risky lottery contains 10 red or blue balls in a known and displayed proportion. The urn representing the ambiguous lottery contains 10 red or blue balls as well but in an unknown proportion. To indicate this, the urn is made opaque. Participants are informed that the proportion of red and blue balls in the ambiguous urn stays the same within each MPL as well as between the two MPLs. The proportion of red and blue balls in the risky urn varies from all red in the first row of both MPLs to all blue in the last row. The two MPLs differ only with respect to the color associated with winning the lottery. We take the average number of risky urn choices over both MPLs as a measure of ambiguity aversion.

More detailed information can be found in Appendix 5.C.1, including the parameters used for the experiments, screenshots of the tasks and instructions, and the exact wording of the survey questions.

Results. Figure 5.3.1 displays cumulative distribution plots of the responses to our risk, higher-order risk, and ambiguity measures, separated for employees and self-employed workers. The text boxes in the figure report p-values from MWU tests. Panels (a) and (b) show that self-employed workers take somewhat more risk in our incentivized measures, but the difference appears to be small. The difference is larger in Panel (c), which shows that self-employed workers in our sample state on average to be more willing to take risks in general compared to employees.[9] Panels (d)-(f) show that the differences between self-employed workers and employees are negligible for higher-order risk preferences and ambiguity aversion.

Table 5.3.3 shows the regression results for our standardized risk, higher-order risk, and ambiguity measures both without (panel i) and with (panel ii) control variables. The results largely confirm our descriptive observations and non-parametric test results. First, in panel (i) we find evidence in favor of a relationship between self-employment and risk-taking in the CTB ($p = 0.006$) and MPLs ($p = 0.048$) and the observed relationships are robust

[9] The results for the domain-specific risk questions (FRQ, CRQ, and HRQ) look very similar and hence are omitted here.



(a) Risk Preference (CTB) (b) Risk Preference (MPL) (c) Risk Preference (GRQ)

(d) Prudence (e) Temperance (f) Ambiguity

Figure 5.3.1: Risk Preferences and Ambiguity Aversion (Cum. Dist.)

Notes: Figures show the cumulative distributions of risk preferences measured with the CTB (a), MPLs (b), GRQ (c), prudence (d) temperance (e), and ambiguity aversion, separated for self-employed and employees. The boxes in each figure display the results from a Mann-Whitney U (MWU) test. $N = 3,902$.

to adding control variables in panel (ii). The effect size is relatively small, however, as the coefficients for CTB and MPL in both panels imply that being self-employed increases risk-taking by less than one-tenth of a standard deviation. Second, there is a clear relationship between self-employment and self-reported willingness to take risks in general in regressions with and without controls ($p < 0.001$ in both cases). The coefficients imply that self-employed workers are on average about one-third of a standard deviation more willing to take risks in general compared to employees.[10] Third, we find no differences between self-employed workers and employees for prudence, tem-

[10]The effect sizes for the domain-specific risk questions are 0.36 ($p < 0.001$), 0.50 ($p < 0.001$), and 0.23 ($p < 0.001$) for FRQ, CRQ, and HRQ, respectively, in the regressions with controls (reported in Table 5.A.1).

perance, and ambiguity aversion in both regressions with and without controls.

Table 5.3.3: Risk Preferences and Ambiguity Aversion (Regressions)

	CTB	MPL	GRQ	Prudence	Temperance	Ambiguity
(i) Without Controls						
Self-Employed	0.09**	0.06*	0.32***	0.00	-0.04	-0.05
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Constant	-0.03	-0.01	-0.12***	0.02	0.01	0.03
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Observations	3,902	3,902	3,902	3,902	3,902	3,902
Adjusted R^2	0.002	0.001	0.025	0.000	0.000	0.000
(ii) With Controls						
Self-Employed	0.08*	0.04*	0.35***	0.02	-0.01	-0.02
	(0.04)	(0.02)	(0.03)	(0.03)	(0.04)	(0.02)
Constant	0.17	-0.34*	1.27***	0.69**	-0.17	0.28*
	(0.26)	(0.14)	(0.25)	(0.26)	(0.26)	(0.12)
Observations	3,901	3,901	3,901	3,901	3,901	3,901
Adjusted R^2	0.012	0.032	0.084	0.007	0.018	0.005

Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. The regression reported in panel (ii) controls for sex, age, age-squared, marital status, children, education level, migration background, household wealth (quintiles), and household income (quintiles). Table 5.A.1 in Appendix 5.A reports full regressions. $^{*}\ p < 0.05$, $^{**}\ p < 0.01$, $^{***}\ p < 0.001$

5.3.3 Time Preferences, Procrastination and Self-Control

Self-employment often involves bearing costs in the short term with the expectation of long-term gains. This trade-off between consumption today and consumption in the future is a fundamental concept in economics and is captured by an individual's time preferences (J. Cohen et al., 2020; Wang et al., 2016). Research on the relationship between time preferences and self-employment is to the best of our knowledge limited, however. Andersen et al. (2014) elicit time preferences with incentivized measures in a field experiment with Danish entrepreneurs. Their results suggest that entrepreneurs are on average slightly more patient than the general population.

Self-control and procrastination are two psychological traits closely related to time preferences. Self-control has been defined as a preference for larger delayed rewards over smaller immediate rewards (Fujita, 2011), thus individuals with high self-control are expected to be more patient as well. The relationship between self-control and self-employment recently started to get

attention. Baron et al. (2016) investigate the role of self-control as a mediator for self-efficacy. They find that entrepreneurs with higher self-control are better able at restraining themselves from setting unattainable goals and therefore have better-performing companies. Thus, while self-control is not directly studied as a determinant for self-employment, it suggests that individuals with higher self-control may be more successful in setting up and maintaining their own businesses. Van Gelderen et al. (2015) investigate the role of self-control in the intention-action gap of entrepreneurs and find that self-control positively moderates the relation between intention and action. Thus, individuals with higher self-control are more likely to act on their intention to set up their own business than those with lower self-control.

Procrastination is the phenomenon of delaying things one intends to do, thus the choice to delay an immediate cost (Klingsieck, 2013). Nguyen et al. (2013) study procrastination in the workplace using survey questions and conclude that individuals who score high on procrastination are less likely to retain jobs that require high motivational skills. Therefore, we may expect self-employed workers to score lower on procrastination compared to employees.

Method. We elicited time preferences using both survey questions and incentivized experimental measures. Self-control and procrastination were elicited with survey questions.

We included two incentivized experimental measures for time preferences. First, we implemented an adapted version of the CTB, as discussed in Section 5.3.2. To infer time preferences from the decisions made in the CTB, we simply take the average euro amount a participant allocates to late period in risk-less decision situations (i.e., where the later payoff was obtained with a 100% chance). Larger values for this variable are thus associated with more patience of the decision-maker.

Second, we implemented two different MPLs in the spirit of Coller and Williams (1999). In each MPL, participants are asked to make nine binary decisions between €75 at an early date (8 weeks from the day of participation) and varying amounts at a later date (either 16 or 24 weeks from the day of participation). Moving down the list, the amounts at the later date increase, yielding interest rates between 0% and 26.7% over the delay period. The point where the participant switches to the option at the later date provides an indication of their time preference. We take the average number of later-date choices over both MPLs as a measure of patience.

The self-reported survey questions for time preferences are based on the work by Falk et al. (2016, 2022). Participants identified themselves as being more or less willing to give something up today to benefit from it in the future on an 11-point Likert scale ranging from "not at all willing" (0) to "very willing" (10). The question was asked twice, once referring to the near future and once referring to the distant future. We asked these questions in both waves of the study and average the responses for our analysis (hereafter GTQ).

Self-control was elicited using the brief self-control scale (Tangney et al., 2004). This scale is composed of 13 statements that aim to capture how much self-control individuals have (e.g., "I am good at resisting temptation" or "I have a hard time breaking bad habits"). Participants were asked to indicate the extent to which each statement reflected how they typically are on a 5-point Likert scale ranging from "not at all" (1) to "very much" (5). The items are converted into an aggregate scale by taking the sum of all responses.

Procrastination was elicited with a non-incentivized survey question based on Falk et al. (2016, 2022). Participants were asked to indicate to what extent a statement describes them on an 11-point Likert scale ranging from "does not describe me at all" (0) to "describes me perfectly" (10). The statement elicited whether participants have the tendency to delay tasks, even when they know it would be better to perform them right away.

More detailed information can be found in Appendix 5.C.2, including the parameters used for the experiments, screenshots of the tasks and instructions, and the exact wording of the survey questions.

Results. Figure 5.3.2 displays cumulative distribution plots of the responses to our time preference, self-control, and procrastination measures, separated for employees and self-employed workers. The text boxes in the figure report p-values from MWU tests. Panel (a) shows that self-employed workers are somewhat less patient in the CTB measure for patience. At the same time, we find no differences in patience in our MPL measure. In contrast to the results in our incentivized measures, we find in panels (c) and (d) that self-employed workers assess themselves as more patient and having higher self-control compared to employees. We find no difference between self-employed workers and employees in their self-assessed tendency to procrastinate in panel (e).

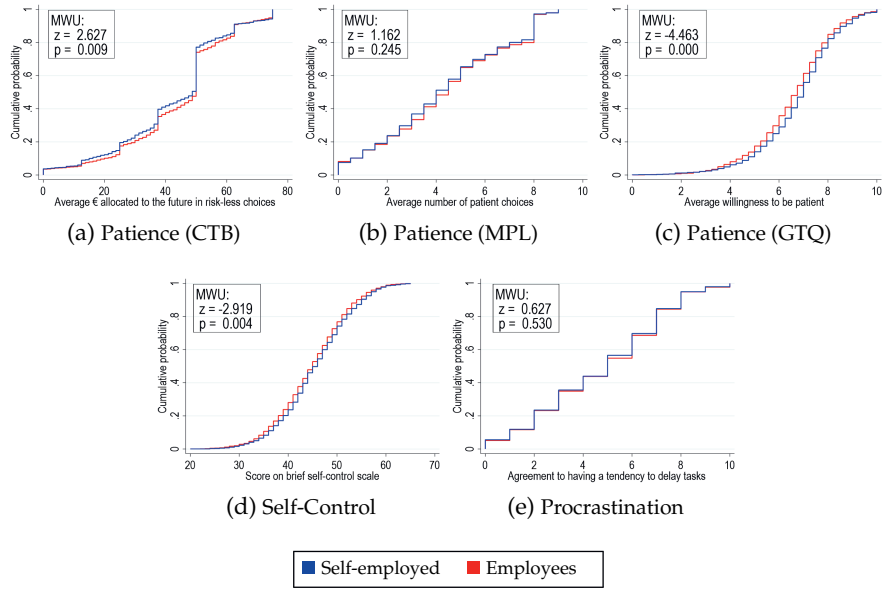


Figure 5.3.2: Time Preferences, Self-Control and Procrastination (Cum. Dist.)

Notes: Figures show the cumulative distributions of time preferences measured with the CTB (a), MPLs (b), and GTQ (c), self-control (d), and procrastination (e), separated for self-employed and employees. The boxes in each figure display the results from a Mann-Whitney U (MWU) test. $N = 3,902$.

The regression results without control variables in panel (i) of Table 5.3.3 corroborate our descriptive observations and non-parametric test results. In particular, we find a small negative relationship between self-employment and our incentivized CTB measure ($p = 0.011$) and no relationship with our MPL measure ($p = 0.309$). At the same time, self-employed workers assess themselves as more patient ($p < 0.001$) and with higher self-control ($p = 0.002$). The results change somewhat when adding controls to the regressions in panel (ii). Most notably, we no longer find a difference between self-employed workers and employees in terms of their self-assessed self-control. On the other hand, we find that the effect size of our GTQ measure increases when adding controls to about one-fifth of a standard deviation. No differences are found between self-employed workers and employees in terms of

Table 5.3.4: Time Preferences, Self-Control, and Procrastination (Regressions)

	CTB	MPL	GTQ	Self-Control	Procrastination
(i) Without Controls					
Self-Employed	-0.08*	-0.03	0.13***	0.10**	-0.02
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Constant	0.05*	0.02	-0.03	-0.05**	0.02
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
Observations	3,902	3,902	3,902	3,902	3,902
Adjusted R^2	0.001	0.000	0.004	0.002	-0.000
(ii) With Controls					
Self-Employed	-0.09*	-0.06	0.18***	-0.03	0.03
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
Constant	0.16	0.35	0.29	-0.70**	-0.06
	(0.24)	(0.22)	(0.26)	(0.27)	(0.26)
Observations	3,901	3,901	3,901	3,901	3,901
Adjusted R^2	0.017	0.029	0.099	0.054	0.017

Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. The regression reported in panel (ii) controls for sex, age, age-squared, marital status, children, education level, migration background, household wealth, and household income. Table 5.A.2 in Appendix 5.A reports full regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

self-assessed tendency to procrastinate in both regressions with and without controls.

5.3.4 Solidarity Preferences and Altruism

Self-employed workers are sometimes perceived as self-centered or egoistic actors (e.g., Caliendo et al., 2012; Harms et al., 2020). In line with this, we may expect that self-employed workers are less altruistic and exhibit less preference for solidarity. The relationship between altruism and self-employment has been studied indirectly, but the results are mixed. On the one hand, there is substantial evidence suggesting that there is a positive relationship between narcissism and self-employment or the intention to become self-employed (Burger et al., 2023 review the literature). In turn, there is some evidence that individuals who score high on narcissism behave less altruistically (N. He and Zhu, 2016), which would suggest that the self-employed may be less altruistic compared to the general population. On the other hand, Tietz and Parker (2014) exploit longitudinal data of self-employed workers in

the US and find that they give more to charity compared to the general population. The relationship between self-employment and solidarity preferences is to the best of our knowledge so far unexplored.

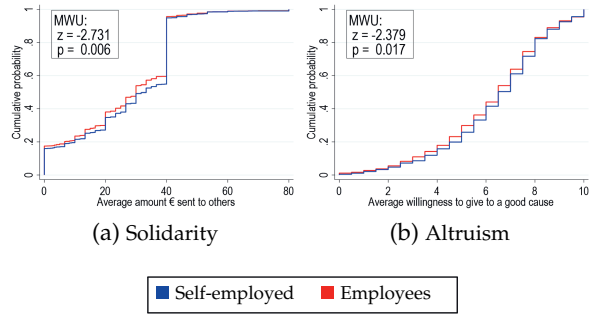
Method. We elicited solidarity preferences with an incentivized experimental measure and altruism with a survey question.

Solidarity preferences were elicited with an incentivized experimental measure in the form of a modified version of the solidarity game introduced by Selten and Ockenfels (1998). Participants were anonymously matched with another participant in the study and were confronted with one of the following four possible situations: (i) both participants win an amount of €80 (with 50% probability), (ii, iii) one participant wins an amount of €80 and the matched other nothing or vice versa (both with 20% probability), (iv) both receive nothing (with 10% probability). Following Riedl et al. (2019), we then elicited solidarity preferences towards different age groups using the strategy method (Selten, 1967). Specifically, for the situation in which the participant received money but their partner did not, they had to decide how much they were willing to transfer to (a) a young participant (between 16 and 34 years), (b) a middle-aged participant (between 35 and 64 years), and (c) an old participant (65 years and older). Here, we take the average amount of money sent over all age groups as a measure of solidarity preferences.

Altruism was elicited with a non-incentivized survey question based on Falk et al. (2016, 2022). Participants self-identified as being more or less willing to give to a good cause without expecting anything in return on an 11-point Likert scale ranging from "not at all willing" (0) to "very willing" (10). The question was asked in both waves of the study. We use the average response for our analysis.

More detailed information can be found in Appendix 5.C.3, including the parameters used for the experiments, screenshots of the tasks and instructions, and the exact wording of the survey questions.

Results. Figure 5.3.3 displays cumulative distribution plots of the responses to our altruism and solidarity measures, separated for employees and self-employed workers. The text boxes in the figure report p-values from MWU tests. Panel (a) shows that self-employed sent slightly more money to others on average in the solidarity game compared to employees. In line with this,



(a) Solidarity (b) Altruism

Figure 5.3.3: Solidarity Preferences and Altruism (Cum. Dist.)

Notes: Figures show the cumulative distributions of solidarity (a), and altruism (b), separated for self-employed and employees. The boxes in each figure display the results from a Mann-Whitney U (MWU) test. $N = 3,902$.

we find in panel (b) that self-employed workers rate themselves as slightly more altruistic compared to employees.

The regression results without control variables in panel (i) of Table 5.3.3 corroborate our descriptive observations and non-parametric test results. In particular, we find a small positive relationship between self-employment and our incentivized solidarity measure ($p = 0.015$) as well as our non-incentivized altruism measure ($p = 0.013$). The effect size is similar in both measures, corresponding to about one-tenth of a standard deviation. The results are not entirely robust, however, to adding controls. The effect size for solidarity remains similar ($p = 0.030$) but the effect size of the altruism question decreases and the coefficient is no longer statistically significant ($p = 0.218$).

Table 5.3.5: Solidarity Preferences and Altruism (Regressions)

	Solidarity	Altruism
(i) Without Controls		
Self-Employed	0.08*	0.08*
	(0.03)	(0.03)
Constant	-0.04	-0.03
	(0.02)	(0.02)
Observations	3,902	3,902
Adjusted R^2	0.001	0.001
(ii) With Controls		
Self-Employed	0.07*	0.04
	(0.03)	(0.03)
Constant	-0.07	-0.73**
	(0.26)	(0.27)
Observations	3,901	3,901
Adjusted R^2	0.008	0.046

Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. The regression reported in panel (ii) controls for sex, age, age-squared, marital status, children, education level, migration background, household wealth, and household income. Table 5.A.3 in Appendix 5.A reports full regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.3.5 Trust and Reciprocity

Trust is considered a critical trait for entrepreneurship and has received much attention in the entrepreneurship literature (see Welter, 2012 for a review). A difficulty of studying trust, however, is that there are many different definitions of trust and therefore it has been studied in many forms (Welter, 2012). We review studies that investigate either generalized trust (trust in other people) or institutional trust (trust in public, private, or political institutions) as a personality trait and investigate its relationship with self-employment. Generalized trust was studied with survey questions, for example, in a sample of Canadian minorities (Nakhaie et al., 2009), a sample of the German population (Caliendo et al., 2012), and a sample including 53 countries (Kwon and Sohn, 2021). Nakhaie et al. (2009) do not find a relationship between generalized trust and self-employment, while Caliendo et al. (2012) find that trust in other people positively affects the likelihood of being self-employed. Kwon and Sohn (2021) distinguish between self-employment and entrepreneurship

and find that entrepreneurship, but not self-employment, is positively associated with generalized trust.[11] Van Dalen and Henkens (2022) measure trust in pension institutions in the Netherlands and find a negative association with self-employment.

The role of positive and negative reciprocity as determinants of being self-employed was studied by Caliendo et al. (2012). Positive reciprocity refers to rewarding the kind actions of others, while negative reciprocity relates to punishing the unkind actions of others (Dohmen et al., 2008). Caliendo et al. (2012) study the relationship between reciprocity and self-employment using survey questions in a German representative sample. They find no relationship between self-employment and positive reciprocity and weak evidence that self-employed workers show lower negative reciprocity than the employed. Their results also suggest a weak positive relationship between negative reciprocity and the probability of exiting self-employment.

Method. We elicited trust and reciprocity with survey questions. The exact wording of the questions can be found in Appendix 5.C.4.

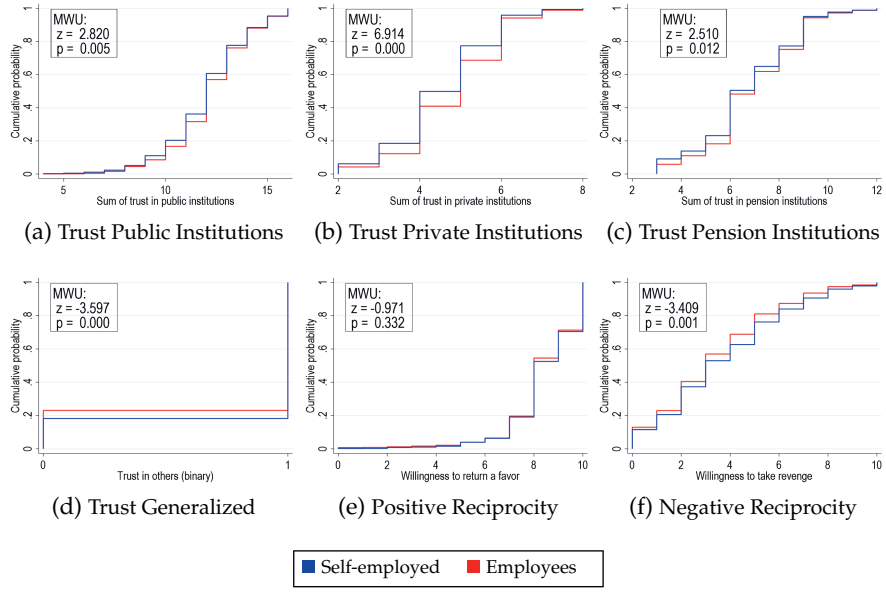
We elicited both generalized and institutional trust with survey questions used by Statistics Netherlands (2012). Generalized trust was elicited with a binary question that asked participants whether they think people can be trusted in general. The binary answer possibilities stated, "You cannot be careful enough" (0) or "Most people can be trusted" (1). Institutional trust was measured by asking participants to indicate their level of trust in several institutions on a 4-point Likert scale ranging from "no trust at all" (1) to "a lot of trust" (4). The institutions included the justice system, police, the Lower House of Parliament, banks, pension funds, large companies, science, the current pension system, and the future pension system.[12] We conducted an exploratory principal-component factor analysis (with oblimin rotation) to investigate whether we can reduce the number of variables into fewer factors. We find clear evidence in favor of three factors: trust in public institutions (justice system, police, lower house of parliament, and science), trust in private institutions (banks and large companies), and trust in the pension

[11] Kwon and Sohn (2021) distinguish between entrepreneurship and self-employment by dividing the group of self-employed workers according to the nature of tasks that they are engaged with. If the individual states at least a seven on a range from 1 "mostly routine tasks" to 10 "mostly creative", then the self-employed worker is considered an entrepreneur.

[12] The last item included the possibility to answer "I don't know" because, at the time of the survey, a change in the Dutch pension system was under discussion but no concrete decisions were made yet on the new system. 793 individuals responded "I don't know".

system (pension funds, current pension system, future pension system). The individual items are converted into scales by taking the sum of the individual items in each factor.

Positive and negative reciprocity were elicited using non-incentivized survey questions (Falk et al., 2016, 2022). In particular, participants were asked to indicate to what extent a statement describes them on an 11-point Likert scale from "does not describe me at all" (0) to "describes me perfectly" (10). The statements elicited whether they are willing to return a favor (positive reciprocity) and are willing to take revenge when treated unjustly (negative reciprocity).



(a) Trust Public Institutions (b) Trust Private Institutions (c) Trust Pension Institutions

(d) Trust Generalized (e) Positive Reciprocity (f) Negative Reciprocity

Figure 5.3.4: Trust and Reciprocity (Cum. Dist.)

Notes: Figures show the cumulative distributions of trust in public institutions (a), trust in private institutions (b), trust in pension institutions (c), generalized trust (d), positive reciprocity (e), and negative reciprocity, separated for self-employed and employees. The boxes in each figure display the results from a Mann-Whitney U (MWU) test. $N = 3,109$ for pension trust and $N = 3,902$ otherwise.

Results. Figure 5.3.4 displays cumulative distribution plots of the responses to our trust and reciprocity measures, separated for employees and self-employed workers. The text boxes in the figure report p-values from MWU tests. Panels (a), (b), and (c) show that self-employed workers indicate to be less trusting of public, private, and pension institutions compared to employees. Interestingly, when it comes to generalized trust (trust in other people) in panel (d), we find that self-employed workers tend to be more likely than employees to respond that they trust others. Panels (e) and (f) show the results for positive- and negative reciprocity respectively. We find no difference between self-employed workers and employees when it comes to positive reciprocity, but find that self-employed workers rate themselves higher on negative reciprocity compared to employees.

The regression results without control variables in panel (i) of Table 5.3.6 corroborate our descriptive observations and non-parametric test results. Compared to employees, self-employed workers indicate to be less trusting of public ($p = 0.004$), private ($p < 0.001$), and pension ($p = 0.006$) institutions, whereas they are more trusting of other people ($p < 0.001$). We observe no difference for positive reciprocity ($p = 0.139$) and a positive effect

Table 5.3.6: Trust and Reciprocity (Regressions)

	Public Trust	Private Trust	Pension Trust	Generalized Trust	Positive Reciprocity	Negative Reciprocity
(i) Without Controls						
Self-Employed	-0.10**	-0.23***	-0.10**	0.05***	0.04	0.12***
	(0.03)	(0.03)	(0.04)	(0.01)	(0.03)	(0.03)
Constant	0.05*	0.11***	0.03	0.77***	-0.00	-0.04*
	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.02)
Observations	3,902	3,902	3,109	3,902	3,902	3,902
Adjusted R^2	0.002	0.012	0.002	0.003	0.000	0.003
(ii) With Controls						
Self-Employed	-0.13***	-0.21***	-0.21***	0.03*	0.05	0.08*
	(0.03)	(0.03)	(0.04)	(0.01)	(0.03)	(0.03)
Constant	-0.42	0.79**	-0.00	0.46***	0.18	-0.58*
	(0.26)	(0.25)	(0.31)	(0.11)	(0.25)	(0.26)
Observations	3,901	3,901	3,108	3,901	3,901	3,901
Adjusted R^2	0.080	0.048	0.045	0.053	0.006	0.048

Notes: Dependent variables, except generalized trust, are standardized (z-score). Robust standard errors in parentheses. The regression reported in panel (ii) controls for sex, age, age-squared, marital status, children, education level, migration background, household wealth, and household income. The number of observations is smaller for pension trust because individuals who answered "I don't know" are excluded. Table 5.A.4 in Appendix 5.A reports full regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

for negative reciprocity ($p < 0.001$). Turning to panel (ii), where we run the regression with control variables, we find largely the same results. The coefficients in panel (ii) increase somewhat for trust in public ($p < 0.001$) and pension ($p < 0.001$) institutions to about one-eight and one-fifth of a standard deviation, respectively. On the other hand, the effect size of generalized trust ($p = 0.022$) decreases somewhat to three percent. The effect size of trust in private institutions ($p < 0.001$) similarly decreases slightly but remains about one-fifth of a standard deviation. The effect size of negative reciprocity ($p < 0.022$) decreases as well to about one-thirteenth of a standard deviation.

5.3.6 Optimism and Overconfidence

Starting a business requires believing in the feasibility of the idea and becoming successful (Frese and Gielnik, 2014; Koellinger et al., 2007), even in the face of low expected returns and high failure rates (Cassar, 2010; Simon and Shrader, 2012). Consequently, (over-)optimism and overconfidence are two closely related personality traits that have been studied extensively in the context of self-employment (Frese and Gielnik, 2014; Simoes et al., 2016). Optimism is defined as a more general view that "good things will happen" (Ästebro et al., 2014). Overconfidence has been studied in various ways, as discussed by Moore and Healy (2008), who define three types of overconfidence. First, people may overestimate their own performance, ability, level of control, or chances of success (overestimation). Second, people may believe that they are better than others (overplacement or better than average). Third, people may report excessive certainty regarding the accuracy of their beliefs (overprecision).

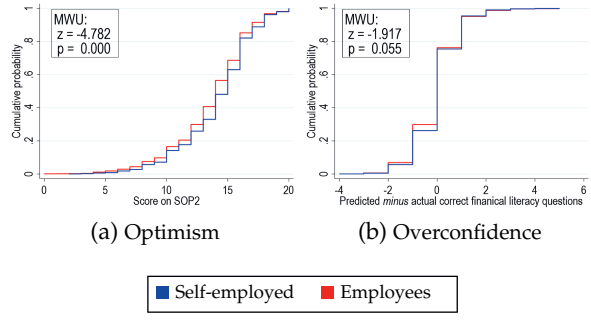
Empirically, overconfidence and optimism are hard to distinguish, and the terms have been used interchangeably in previous literature (Ästebro et al., 2014). For example, Cooper et al. (1988) asked entrepreneurs to state the odds of their own business succeeding and found that a third of the respondents perceived those odds as 10 out of 10, despite reporting much lower odds for the success of other companies similar to their own. It is not clear whether this measures overconfidence or optimism. Ästebro et al. (2014) conclude from a review of the empirical literature that there is some evidence suggesting a positive relationship between self-employment and either optimism, overestimation, or overplacement. Evidence on the relationship between self-employment and overprecision is mixed.

Method. We elicited optimism and overconfidence with survey questions. The exact wording of the questions can be found in Appendix 5.C.5.

We elicited optimism with an adapted version of the Optimism-Pessimism-2 Scale (SOP2; Kemper et al., 2017). This scale consisted of two questions where participants were asked to indicate how optimistic and pessimistic they are in general on an 11-point Likert scale ranging from "not optimistic at all" (0) to "very optimistic" (10) and "not pessimistic at all" (0) to "very pessimistic" (10). The answers are converted into a scale by reversing the scores of the pessimism question and then taking the sum of both responses.

We measured overconfidence by asking participants to judge how many financial literacy questions (see Section 5.3.7) they thought they had correct after answering them. We, therefore, measure overconfidence as overestimating one's own performance (Moore and Healy, 2008). The measure was constructed by taking the number of answers that the participant thought to have correct and subtracting the number of actual correct answers. A positive score therefore indicates overconfidence and a negative score underconfidence.

Results. Figure 5.3.5 displays cumulative distribution plots of the responses to our optimism and overconfidence measures, separated for employees and self-employed workers. The text boxes in the figure report p-values from



(a) Optimism (b) Overconfidence

Figure 5.3.5: Optimism and Overconfidence (Cum. Dist.)

Notes: Figures show the cumulative distributions of optimism (a) and overconfidence (b), separated for self-employed and employees. The boxes in each figure display the results from a Mann-Whitney U (MWU) test. $N = 3,902$.

MWU tests. Panel (a) shows that self-employed workers indicate to be more optimistic compared to employees. Panel (b) shows very weak evidence of a relationship between self-employment and overconfidence, which appears to be driven by employees who are on average slightly more *under*-confident compared to self-employed workers.

Table 5.3.7: Optimism and Overconfidence (Regressions)

	Optimism	Overconfidence
(i) Without Controls		
Self-Employed	0.15***	0.05
	(0.03)	(0.03)
Constant	-0.06**	-0.04
	(0.02)	(0.02)
Observations	3,902	3,902
Adjusted R^2	0.005	0.000
(ii) With Controls		
Self-Employed	0.11***	0.01
	(0.03)	(0.03)
Constant	-0.80**	-0.38
	(0.26)	(0.27)
Observations	3,901	3,901
Adjusted R^2	0.029	0.017

Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. The regression reported in panel (ii) controls for sex, age, age-squared, marital status, children, education level, migration background, household wealth, and household income. Table 5.A.5 in Appendix 5.A reports full regressions. * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

The regression results without control variables in panel (i) of Table 5.3.7 corroborate our descriptive observations and non-parametric test results. The coefficients for optimism ($p < 0.001$) and overconfidence ($p = 0.109$) are both positive, but the latter is very weak. The effect sizes become smaller when adding controls to the regression in panel (ii). The coefficient for optimism ($p = 0.001$) is about one-tenth of a standard deviation.

5.3.7 Cognitive Reflection, Financial Literacy, and Financial Management

Self-employed workers generally operate in a complex environment and have to be able to recognize opportunities that can be profitably exploited (Baron, 2004). Moreover, they are often responsible for their own insurance, pension-building, and other financial matters. Therefore, several authors have studied the relationship between self-employment and cognitive ability (Hartog et al., 2010; Levine and Rubinstein, 2017) and more recently financial literacy. Specifically, Ćumurović and Hyll (2019) find a positive relationship between financial literacy and being self-employed using German survey data. Riepe et al. (2020) investigate the role of financial literacy and its interaction with risk aversion using survey and experimental data from the Netherlands. They found that risk aversion played a role in the likelihood of being self-employed for individuals with below-average financial literacy scores, but no such relationship was found for individuals with above-average financial literacy scores. Struckell et al. (2022) find a positive relationship between financial literacy and self-employment in the United States. The relationship between self-employment and financial management is to the best of our knowledge so far unexplored. Given that self-employed workers are largely responsible for their own financial matters, including insurance and pension-building, financial management is a particularly important skill for this group.

Method. We elicited cognitive reflection and financial literacy with multiple-choice questions that could be answered correctly or incorrectly. Financial management was elicited with survey questions. The exact wording of the questions can be found in Appendix 5.C.6.

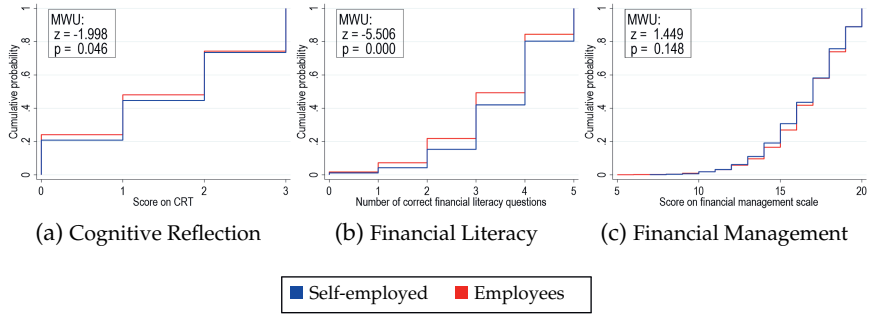
We elicited cognitive reflection with the cognitive reflection test (CRT; Frederick, 2005). The CRT consists of three questions with a seemingly intuitive answer that is incorrect. Individuals should be able to provide the correct answer if they take time to reflect on their answers. Cognitive reflection thus measures participants' ability to override an intuitive heuristic. We take the number of correct answers as a measure of cognitive reflection.

Financial literacy was elicited using five multiple-choice financial literacy questions (Lusardi & Mitchell, 2014). The questions are designed to test how knowledgeable participants are concerning financial matters in the domain

of interest rates, stocks, and mortgages. As a measure of financial literacy, we take the number of correct answers.

Financial management was elicited using a scale proposed by Antonides et al. (2011). The scale contains four statements concerning how individuals deal with financial affairs (e.g. paying bills on time). Participants were asked to indicate the extent to which they agreed with each statement on a 5-point Likert scale ranging from "totally disagree" (1) to "totally agree" (5). As a measure of financial management, we take the sum of the responses to the individual items.

Results. Figure 5.3.6 displays cumulative distribution plots of the correct number of answers to the cognitive reflection and financial literacy questions, as well as the responses to the financial management questions, separated for employees and self-employed workers. The text boxes in the figure report p-values from MWU tests. Panels (a) and (b) show that self-employed workers tend to have slightly more correct answers in the CRT and financial literacy questions. There appears to be no relationship between self-employment and financial management in panel (c).



(a) Cognitive Reflection (b) Financial Literacy (c) Financial Management

Figure 5.3.6: Cognitive Reflection, Financial Literacy, and Financial Management (Cum. Dist.)

Notes: Figures show the cumulative distributions of cognitive reflection (a), financial literacy (b), and financial management (c), separated for self-employed and employees. The boxes in each figure display the results from a Mann-Whitney U (MWU) test. $N = 3,902$.

The regression results without control variables in panel (i) of Table 5.3.8 corroborate our descriptive observations and non-parametric test results. The coefficients for cognitive reflection ($p = 0.040$) and financial literacy ($p < 0.001$) are both positive, whereas there is no effect for financial management ($p = 0.162$). The results are not robust, however, to adding controls in panel (ii). In particular, the effects found for cognitive reflection and financial literacy vanish entirely, which can mainly be attributed to the inclusion of sex and wealth as control variables. On the other hand, we now find a negative relationship between self-employment and self-assessed financial management ($p < 0.001$).

Table 5.3.8: Cognitive Reflection, Financial Literacy, and Financial Management (Regressions)

	Cognitive Reflection	Financial Literacy	Financial Management
(i) Without Controls			
Self-Employed	0.07*	0.19***	-0.05
	(0.03)	(0.03)	(0.03)
Constant	-0.02	-0.07**	0.01
	(0.02)	(0.02)	(0.02)
Observations	3,902	3,902	3,902
Adjusted R^2	0.001	0.008	0.000
(ii) With Controls			
Self-Employed	0.00	0.02	-0.18***
	(0.03)	(0.02)	(0.03)
Constant	-0.22	-0.02	-0.74**
	(0.25)	(0.16)	(0.25)
Observations	3,901	3,901	3,901
Adjusted R^2	0.111	0.130	0.067

Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. The regression reported in panel (ii) controls for sex, age, age-squared, marital status, children, education level, migration background, household wealth, and household income. Table 5.A.6 in Appendix 5.A reports full regressions.
* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.4 Discussion and Conclusion

In this chapter, we investigated differences in demographic characteristics and a wide range of preferences and traits between self-employed workers

and employees in a large sample of the Dutch working population. Among this sample, we implemented a survey, including incentivized economic experiments, in which we elicited economic preferences (risk, higher-order risk, time, ambiguity aversion), social preferences (solidarity, altruism, and reciprocity), personality traits (self-control, procrastination, trust, overconfidence, and optimism), and cognitive traits (financial literacy, financial management, and cognitive reflection). Data from the survey were enriched with demographic variables from register data provided by Statistics Netherlands.

We find that self-employed workers differ in some preferences and traits, but also share similarities. First, self-employed workers indicate that they have a higher willingness to take risks compared to employees, corroborating previous studies (e.g., Ahn, 2010; Brown et al., 2011; Dohmen et al., 2011; Ekelund et al., 2005). In line with their self-assessment, they also take more risks in the incentivized economic experiments, but the effect size is small. As discussed, previous studies have found mixed results concerning differences between self-employed and employees in risk-taking in incentivized experiments (see Bokern, Linde, Riedl, Schmeets, et al., 2021 for a review). The small effect size that we find suggests that a statistically significant effect can only be detected with a sufficiently large sample size. Further research is needed to shed light on why such differences are found between stated and revealed preference methods for measuring risk preferences (see also Mata et al., 2018). We do not find any differences between self-employed workers and employees for higher-order risk preferences (prudence and temperance), corroborating Noussair et al. (2014), and ambiguity aversion, in line with previous studies that examine ambiguity aversion with incentivized tasks (Holm et al., 2013; Koudstaal et al., 2016).

Second, self-employed workers indicate that they are more patient than employees. At the same time, self-employed workers behave slightly less patiently than employees when it comes to their decisions in incentivized experiments. This finding contrasts Andersen et al. (2014), who found that self-employed individuals behaved slightly more patiently in incentivized choice tasks. Our results, therefore, do not allow for any conclusive statements about the difference between self-employed workers and employees in their time preferences, and more research on this topic is needed. We find no differences between self-employed workers and employees in their self-assessed self-control and tendency to procrastinate, which is contrary to our expectation based on indirect evidence in the literature.

Third, compared to employees, self-employed workers indicate that they are slightly more altruistic and send slightly more to others on average in the solidarity game. These results are in line with Tietz and Parker (2014) who found that self-employed workers give more to charity, and contrasts our hypothesis that self-employed workers may be less altruistic because they are found to be more narcissistic (Burger et al., 2023). It is important to note, however, the effect size for both these effects is small and becomes statistically insignificant for self-assessed altruism when adding control variables. If anything, we thus find weak evidence that self-employed workers are more altruistic.

Fourth, self-employed workers have less trust in institutions (public, private, and pension) and somewhat more trust in other people compared to employees. This is in line with van Dalen and Henkens (2022) who similarly find that self-employed workers have lower trust in pension institutions. The small but positive relationship between self-employment and generalized trust is in line with Caliendo et al. (2012) and Kwon and Sohn (2021) who found a similar relationship in samples of entrepreneurs.

Fifth, compared to employees, self-employed workers are more optimistic, which is largely in line with previous literature (Ästebro et al., 2014). We do not find any difference between self-employed workers and employees in their overconfidence. Note, however, that this pertains to overconfidence measured as "overestimation" in financial literacy. As discussed, there exist different types of overconfidence (Moore and Healy, 2008) and we cannot generally conclude from our results that there is no relationship between overconfidence and self-employment.

Finally, we find that self-employed workers score lower on financial management when controlling for demographic characteristics in the regression. No differences are found between self-employed workers and employees in their cognitive reflection and financial literacy, after controlling for demographic characteristics. This result contrasts recent findings suggesting a positive relationship between financial literacy and self-employment (Ćumurović & Hyll, 2019; Struckell et al., 2022).

Our results are particularly relevant for policymakers in the Netherlands who have been increasingly concerned about the socio-economic position of the self-employed, including the adequacy of their retirement savings (e.g., Ministry of Social Affairs and Employment, 2021). The self-employed tend to make little use of traditional pension saving instruments (Zwinkels et al., 2017) and have significantly lower pension replacement rates than employees

(de Bresser and Knoef, 2015; Knoef et al., 2017; Knoef et al., 2016; Zwinkels et al., 2017). In response to this concern, the adequacy of retirement saving by the self-employed is addressed in the proposed pension reform in the Netherlands (Ministry of Social Affairs and Employment, 2022).[13] At the same time, the lower levels of trust in institutions should be addressed to increase the willingness of this group to accept involvement by various institutions in their financial decisions.

In conclusion, we provide direct evidence of differences and similarities between self-employed workers and employees in terms of their demographics, preferences, and traits, in a unique dataset of the Netherlands. We corroborate several findings from previous literature but also find some novel results. The results contribute to a better understanding of who the self-employed are and are relevant to currently ongoing policy debates surrounding self-employment in the Netherlands.

[13] In particular, the new pension agreement contains a clause that stipulates that pension funds may experiment with simplification of retirement saving for the self-employed in the second pillar. The aim of these experiments is to stimulate the self-employed to build up sufficient retirement savings. This experiment lasts up to four years, after which the effects will be evaluated and decisions will be made about more structural changes. Participation in the experiments by the self-employed is voluntary.

Appendices

5.A Full Regressions

Table 5.A.1: Risk Preferences and Ambiguity Aversion (Full Regressions)

	CTB	MPL	GRQ	FRQ	CRQ	HRQ	Prudence	Temperance	Ambiguity
Self-Employed	0.08*	0.04*	0.35***	0.36***	0.50***	0.23***	0.02	-0.01	-0.02
	(0.04)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.04)	(0.02)
Sex (=Female)	-0.20***	-0.14***	-0.36***	-0.40***	-0.15***	-0.14***	0.06*	0.24***	-0.02
	(0.03)	(0.02)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)	(0.01)
Age	-0.02	-0.02**	-0.05***	-0.03**	-0.02	-0.02	0.02*	0.01	0.01*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age Squared	0.00	0.00*	0.00***	0.00	0.00	0.00	-0.00*	-0.00	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Marital Status (=Married)	-0.01	-0.01	-0.18***	-0.20***	-0.09*	-0.14***	0.01	0.05	-0.02
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.02)
Marital Status (=Widowed)	-0.34*	0.05	-0.13	-0.12	0.22	0.04	-0.11	-0.10	-0.13
	(0.15)	(0.13)	(0.17)	(0.16)	(0.16)	(0.16)	(0.20)	(0.20)	(0.08)
Marital Status (=Divorced)	0.10	-0.02	0.04	-0.03	0.02	-0.02	-0.03	-0.02	0.02
	(0.07)	(0.04)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.07)	(0.03)
Children (=Yes)	0.07	0.05*	0.17***	0.16***	0.03	0.03	-0.05	-0.13**	0.00
	(0.04)	(0.02)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.02)
Education Level (=Middle)	-0.01	0.06	-0.06	0.03	0.06	0.03	0.16	-0.08	0.03
	(0.08)	(0.05)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.08)	(0.04)
Education Level (=High)	0.03	0.10*	-0.07	0.10	0.12	0.01	0.29***	-0.13	0.02
	(0.08)	(0.04)	(0.08)	(0.08)	(0.08)	(0.09)	(0.09)	(0.08)	(0.04)
Education Level (=Unknown)	0.03	0.07	-0.04	0.02	0.04	-0.06	0.14	-0.07	0.02
	(0.09)	(0.05)	(0.08)	(0.08)	(0.09)	(0.09)	(0.09)	(0.08)	(0.04)
Migration Background (=Native)	0.04	0.04	0.05	0.01	-0.00	0.14**	0.01	0.00	-0.03
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)
Household Wealth (Quintile=1)	-0.08	0.04	0.09	-0.01	0.10	0.04	-0.04	0.19***	-0.02
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)
Household Wealth (Quintile=2)	0.02	0.06*	0.02	-0.02	0.03	0.04	0.00	0.02	-0.04
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)
Household Wealth (Quintile=4)	-0.01	0.02	-0.10*	-0.08	-0.06	-0.05	-0.03	0.04	-0.01
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)
Household Wealth (Quintile=5)	-0.03	0.02	0.01	0.07	-0.07	-0.07	0.01	0.05	0.01
	(0.06)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.06)	(0.02)
Household Income (Quintile=1)	-0.01	-0.04	-0.08	-0.09	0.03	-0.01	-0.03	-0.03	-0.00
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)
Household Income (Quintile=2)	-0.03	-0.01	-0.05	-0.04	-0.03	-0.01	-0.04	-0.03	-0.02
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)
Household Income (Quintile=4)	0.06	0.05	0.13**	0.09*	0.07	0.00	-0.07	-0.03	-0.03
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)
Household Income (Quintile=5)	0.09	0.10***	0.17***	0.16**	0.12*	0.04	-0.07	-0.07	-0.01
	(0.05)	(0.03)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.02)
Constant	0.27	-0.34*	1.26***	0.85**	0.35	0.60*	-0.63*	-0.33	0.30*
	(0.27)	(0.14)	(0.26)	(0.26)	(0.26)	(0.26)	(0.26)	(0.27)	(0.12)
Observations	3901	3901	3901	3901	3901	3901	3901	3901	3901
Adjusted R^2	0.012	0.032	0.084	0.097	0.070	0.043	0.007	0.018	0.005

Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. Baselevels: Employee, Sex (=Male), Marital Status (=Single), Children (=No), Education Level (=Low), Migration Background (=Non-Native), Household Wealth (Quintile=3), Household Income (Quintile=3). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.A.2: Time Preferences, Self-Control, and Procrastination (Full Regressions)

	CTB	MPL	GTQ	Self-Control	Procrastination
Self-Employed	-0.09*	-0.06	0.18***	-0.03	0.03
	(0.03)	(0.03)	(0.03)	(0.04)	(0.03)
Sex (=Female)	-0.00	-0.02	-0.22***	0.12***	-0.10**
	(0.03)	(0.03)	(0.03)	(0.03)	(0.03)
Age	-0.02	-0.00	0.00	0.00	0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Age Squared	0.00	-0.00	-0.00*	0.00	-0.00
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Marital Status (=Married)	-0.08	-0.04	-0.10*	0.12**	-0.14***
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Marital Status (=Widowed)	0.20	0.06	0.30	0.10	-0.11
	(0.22)	(0.14)	(0.16)	(0.18)	(0.19)
Marital Status (=Divorced)	-0.06	-0.07	0.03	0.20**	-0.15*
	(0.07)	(0.06)	(0.07)	(0.07)	(0.07)
Children (=Yes)	0.02	-0.04	0.04	-0.01	-0.05
	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)
Education Level (=Middle)	-0.00	0.02	0.10	0.01	0.08
	(0.08)	(0.07)	(0.09)	(0.09)	(0.08)
Education Level (=High)	0.14	0.26***	0.30***	0.17*	0.11
	(0.08)	(0.07)	(0.09)	(0.09)	(0.08)
Education Level (=Unknown)	-0.01	0.07	0.10	0.06	-0.04
	(0.09)	(0.08)	(0.09)	(0.09)	(0.09)
Migration Background (=Native)	0.22***	0.11*	0.00	-0.07	0.04
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=1)	-0.06	-0.14**	-0.08	-0.16**	0.07
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=2)	0.02	-0.02	-0.02	-0.06	0.08
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=4)	0.03	0.09*	0.06	0.11*	0.01
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Wealth (Quintile=5)	0.06	0.18***	0.21***	0.19***	-0.02
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=1)	-0.03	-0.00	-0.03	-0.02	0.05
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=2)	0.05	-0.01	-0.07	0.08	-0.06
	(0.05)	(0.04)	(0.05)	(0.05)	(0.05)
Household Income (Quintile=4)	0.09	-0.04	-0.00	0.03	-0.02
	(0.05)	(0.04)	(0.04)	(0.05)	(0.05)
Household Income (Quintile=5)	0.07	-0.06	0.01	-0.00	-0.04
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Constant	0.25	0.49*	0.40	-0.53	-0.18
	(0.25)	(0.23)	(0.26)	(0.27)	(0.27)
Observations	3901	3901	3901	3901	3901
Adjusted R^2	0.017	0.029	0.099	0.054	0.017

Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. Base-levels: Employee, Sex (=Male), Marital Status (=Single), Children (=No), Education Level (=Low), Migration Background (=Non-Native), Household Wealth (Quintile=3), Household Income (Quintile=3). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.A.3: Solidarity Preferences and Altruism (Full Regressions)

	Solidarity	Altruism
Self-Employed	0.07*	0.04
	(0.03)	(0.03)
Sex (=Female)	0.04	0.27***
	(0.03)	(0.03)
Age	-0.01	0.00
	(0.01)	(0.01)
Age Squared	0.00	0.00
	(0.00)	(0.00)
Marital Status (=Married)	0.06	0.00
	(0.04)	(0.04)
Marital Status (=Widowed)	0.06	-0.18
	(0.22)	(0.16)
Marital Status (=Divorced)	0.00	-0.09
	(0.07)	(0.07)
Children (=Yes)	-0.02	-0.00
	(0.04)	(0.04)
Education Level (=Middle)	-0.07	0.30**
	(0.09)	(0.09)
Education Level (=High)	-0.01	0.49***
	(0.09)	(0.09)
Education Level (=Unknown)	-0.01	0.29**
	(0.09)	(0.09)
Migration Background (=Native)	0.01	-0.08
	(0.05)	(0.05)
Household Wealth (Quintile=1)	0.09	0.06
	(0.05)	(0.05)
Household Wealth (Quintile=2)	0.12*	0.01
	(0.05)	(0.05)
Household Wealth (Quintile=4)	0.00	0.02
	(0.05)	(0.05)
Household Wealth (Quintile=5)	-0.06	-0.03
	(0.05)	(0.05)
Household Income (Quintile=1)	-0.02	-0.02
	(0.05)	(0.05)
Household Income (Quintile=2)	-0.01	-0.12*
	(0.05)	(0.05)
Household Income (Quintile=4)	-0.01	0.05
	(0.05)	(0.05)
Household Income (Quintile=5)	-0.01	0.15**
	(0.05)	(0.05)
Constant	-0.13	-0.77**
	(0.27)	(0.28)
Observations	3901	3901
Adjusted R^2	0.008	0.046

Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. Baselevels: Employee, Sex (=Male), Marital Status (=Single), Children (=No), Education Level (=Low), Migration Background (=Non-Native), Household Wealth (Quintile=3), Household Income (Quintile=3). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.A.4: Trust and Reciprocity (Full Regressions)

	Public	Private	Pension	Generalized	Pos. Reciprocity	Neg. Reciprocity
Self-Employed	-0.13***	-0.21***	-0.21***	0.03*	0.05	0.08*
	(0.03)	(0.03)	(0.04)	(0.01)	(0.03)	(0.03)
Sex (=Female)	-0.10***	0.06	-0.14***	-0.01	-0.10**	-0.36***
	(0.03)	(0.03)	(0.04)	(0.01)	(0.03)	(0.03)
Age	-0.02	-0.03*	-0.03	-0.00	-0.00	0.03**
	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)
Age Squared	0.00	0.00	0.00*	0.00	0.00	-0.00**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Marital Status (=Married)	-0.03	0.11*	0.05	-0.00	-0.05	-0.09*
	(0.04)	(0.04)	(0.05)	(0.02)	(0.04)	(0.04)
Marital Status (=Widowed)	-0.18	0.33*	0.18	0.05	-0.21	-0.28*
	(0.19)	(0.15)	(0.17)	(0.07)	(0.29)	(0.13)
Marital Status (=Divorced)	-0.06	0.17*	-0.08	-0.02	0.06	-0.12
	(0.07)	(0.07)	(0.07)	(0.03)	(0.06)	(0.07)
Children (=Yes)	0.06	0.13**	0.08	0.02	-0.05	0.06
	(0.04)	(0.04)	(0.05)	(0.02)	(0.04)	(0.04)
Education Level (=Middle)	0.36***	-0.02	0.13	0.14***	0.09	-0.02
	(0.10)	(0.08)	(0.09)	(0.04)	(0.09)	(0.09)
Education Level (=High)	0.77***	-0.03	0.30**	0.27***	0.12	-0.18*
	(0.09)	(0.08)	(0.09)	(0.04)	(0.09)	(0.09)
Education Level (=Unknown)	0.37***	-0.04	0.18	0.15***	0.15	-0.04
	(0.10)	(0.08)	(0.09)	(0.04)	(0.09)	(0.09)
Migration Background (=Native)	0.17***	0.05	0.06	0.10***	0.01	-0.03
	(0.05)	(0.05)	(0.05)	(0.02)	(0.05)	(0.05)
Household Wealth (Quintile=1)	-0.03	-0.07	-0.06	0.01	0.06	-0.02
	(0.05)	(0.05)	(0.06)	(0.02)	(0.05)	(0.05)
Household Wealth (Quintile=2)	-0.05	-0.11*	-0.03	-0.01	-0.02	-0.00
	(0.05)	(0.05)	(0.05)	(0.02)	(0.05)	(0.05)
Household Wealth (Quintile=4)	0.10*	0.02	0.06	0.01	0.10*	0.02
	(0.05)	(0.05)	(0.05)	(0.02)	(0.05)	(0.05)
Household Wealth (Quintile=5)	0.05	0.12*	0.08	0.02	-0.02	0.07
	(0.05)	(0.05)	(0.06)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=1)	-0.15**	-0.10	-0.04	-0.06**	0.07	-0.13*
	(0.05)	(0.05)	(0.06)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=2)	-0.08	-0.03	0.04	-0.01	0.05	0.06
	(0.05)	(0.05)	(0.05)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=4)	0.03	0.01	-0.00	0.02	0.00	0.05
	(0.05)	(0.05)	(0.05)	(0.02)	(0.05)	(0.05)
Household Income (Quintile=5)	0.11*	0.15**	0.23***	0.04*	-0.00	0.13*
	(0.05)	(0.05)	(0.06)	(0.02)	(0.05)	(0.05)
Constant	-0.24	0.95***	0.09	0.51***	0.05	-0.44
	(0.27)	(0.26)	(0.32)	(0.11)	(0.26)	(0.27)
Observations	3901	3901	3108	3901	3901	3901
Adjusted R^2	0.080	0.048	0.045	0.053	0.006	0.048

Notes: Dependent variables, except generalized trust, are standardized (z-score). Robust standard errors in parentheses. Baselevels: Employee, Sex (=Male), Marital Status (=Single), Children (=No), Education Level (=Low), Migration Background (=Non-Native), Household Wealth (Quintile=3), Household Income (Quintile=3). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.A.5: Optimism and Overconfidence (Full Regressions)

	Optimism	Overconfidence
Self-Employed	0.11***	0.01
	(0.03)	(0.03)
Sex (=Female)	0.05	-0.21***
	(0.03)	(0.03)
Age	-0.00	0.01
	(0.01)	(0.01)
Age Squared	0.00	-0.00
	(0.00)	(0.00)
Marital Status (=Married)	0.03	0.00
	(0.04)	(0.04)
Marital Status (=Widowed)	0.11	0.20
	(0.17)	(0.25)
Marital Status (=Divorced)	0.18**	0.12
	(0.06)	(0.07)
Children (=Yes)	0.11**	0.01
	(0.04)	(0.04)
Education Level (=Middle)	0.32**	0.03
	(0.10)	(0.10)
Education Level (=High)	0.41***	0.05
	(0.10)	(0.10)
Education Level (=Unknown)	0.32**	0.04
	(0.10)	(0.10)
Migration Background (=Native)	0.08	-0.14**
	(0.05)	(0.05)
Household Wealth (Quintile=1)	0.00	-0.03
	(0.05)	(0.06)
Household Wealth (Quintile=2)	0.03	0.00
	(0.05)	(0.05)
Household Wealth (Quintile=4)	-0.00	-0.00
	(0.05)	(0.05)
Household Wealth (Quintile=5)	-0.03	-0.10
	(0.05)	(0.05)
Household Income (Quintile=1)	-0.15**	-0.06
	(0.06)	(0.06)
Household Income (Quintile=2)	0.02	-0.02
	(0.05)	(0.05)
Household Income (Quintile=4)	0.03	-0.01
	(0.05)	(0.05)
Household Income (Quintile=5)	0.13**	0.05
	(0.05)	(0.05)
Constant	-0.66*	-0.29
	(0.27)	(0.28)
Observations	3901	3901
Adjusted R^2	0.029	0.017

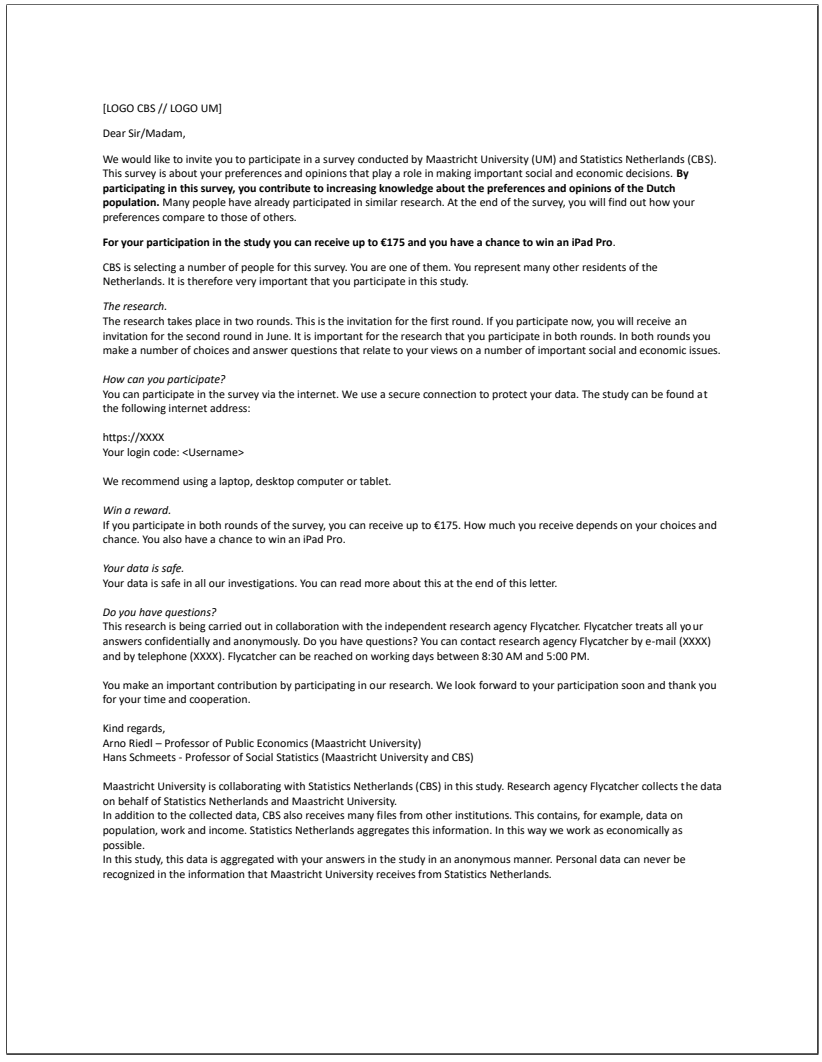
Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. Baselevels: Employee, Sex (=Male), Marital Status (=Single), Children (=No), Education Level (=Low), Migration Background (=Non-Native), Household Wealth (Quintile=3), Household Income (Quintile=3). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 5.A.6: Cognitive Reflection, Financial Literacy, and Financial Management (Full Regressions)

	CRT	Literacy	Management
Self-Employed	0.00	0.02	-0.18***
	(0.03)	(0.02)	(0.03)
Sex (=Female)	-0.41***	-0.28***	-0.02
	(0.03)	(0.02)	(0.03)
Age	-0.01	0.01	0.00
	(0.01)	(0.01)	(0.01)
Age Squared	0.00	-0.00	0.00
	(0.00)	(0.00)	(0.00)
Marital Status (=Married)	-0.02	0.01	0.06
	(0.04)	(0.03)	(0.04)
Marital Status (=Widowed)	-0.20	-0.04	0.06
	(0.19)	(0.12)	(0.16)
Marital Status (=Divorced)	-0.17**	-0.05	-0.00
	(0.06)	(0.04)	(0.07)
Children (=Yes)	-0.00	0.03	-0.18***
	(0.04)	(0.02)	(0.04)
Education Level (=Middle)	0.26***	0.16**	0.08
	(0.08)	(0.06)	(0.09)
Education Level (=High)	0.65***	0.33***	0.20*
	(0.07)	(0.06)	(0.09)
Education Level (=Unknown)	0.26***	0.21***	0.12
	(0.08)	(0.06)	(0.09)
Migration Background (=Native)	0.07	0.09***	0.20***
	(0.05)	(0.03)	(0.05)
Household Wealth (Quintile=1)	-0.13*	-0.08*	-0.38***
	(0.05)	(0.03)	(0.06)
Household Wealth (Quintile=2)	-0.15***	-0.07*	-0.10*
	(0.05)	(0.03)	(0.05)
Household Wealth (Quintile=4)	0.04	0.03	0.14**
	(0.05)	(0.03)	(0.05)
Household Wealth (Quintile=5)	0.11*	0.15***	0.31***
	(0.05)	(0.03)	(0.05)
Household Income (Quintile=1)	-0.09	-0.03	-0.06
	(0.05)	(0.03)	(0.05)
Household Income (Quintile=2)	-0.07	-0.01	0.01
	(0.05)	(0.03)	(0.05)
Household Income (Quintile=4)	-0.04	0.04	-0.01
	(0.05)	(0.03)	(0.05)
Household Income (Quintile=5)	0.09	0.10***	0.02
	(0.05)	(0.03)	(0.05)
Constant	-0.01	0.09	-0.31
	(0.26)	(0.16)	(0.26)
Observations	3901	3901	3901
Adjusted R^2	0.111	0.130	0.067

Notes: Dependent variables are standardized (z-score). Robust standard errors in parentheses. Baselevels: Employee, Sex (=Male), Marital Status (=Single), Children (=No), Education Level (=Low), Migration Background (=Non-Native), Household Wealth (Quintile=3), Household Income (Quintile=3). * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

5.B Invitation Letters and Welcome Screens



[LOGO CBS // LOGO UM]

Dear Sir/Madam,

We would like to invite you to participate in a survey conducted by Maastricht University (UM) and Statistics Netherlands (CBS). This survey is about your preferences and opinions that play a role in making important social and economic decisions. **By participating in this survey, you contribute to increasing knowledge about the preferences and opinions of the Dutch population.** Many people have already participated in similar research. At the end of the survey, you will find out how your preferences compare to those of others.

For your participation in the study you can receive up to €175 and you have a chance to win an iPad Pro.

CBS is selecting a number of people for this survey. You are one of them. You represent many other residents of the Netherlands. It is therefore very important that you participate in this study.

The research.
The research takes place in two rounds. This is the invitation for the first round. If you participate now, you will receive an invitation for the second round in June. It is important for the research that you participate in both rounds. In both rounds you make a number of choices and answer questions that relate to your views on a number of important social and economic issues.

How can you participate?
You can participate in the survey via the internet. We use a secure connection to protect your data. The study can be found at the following internet address:

https://XXXX
Your login code: <Username>

We recommend using a laptop, desktop computer or tablet.

Win a reward.
If you participate in both rounds of the survey, you can receive up to €175. How much you receive depends on your choices and chance. You also have a chance to win an iPad Pro.

Your data is safe.
Your data is safe in all our investigations. You can read more about this at the end of this letter.

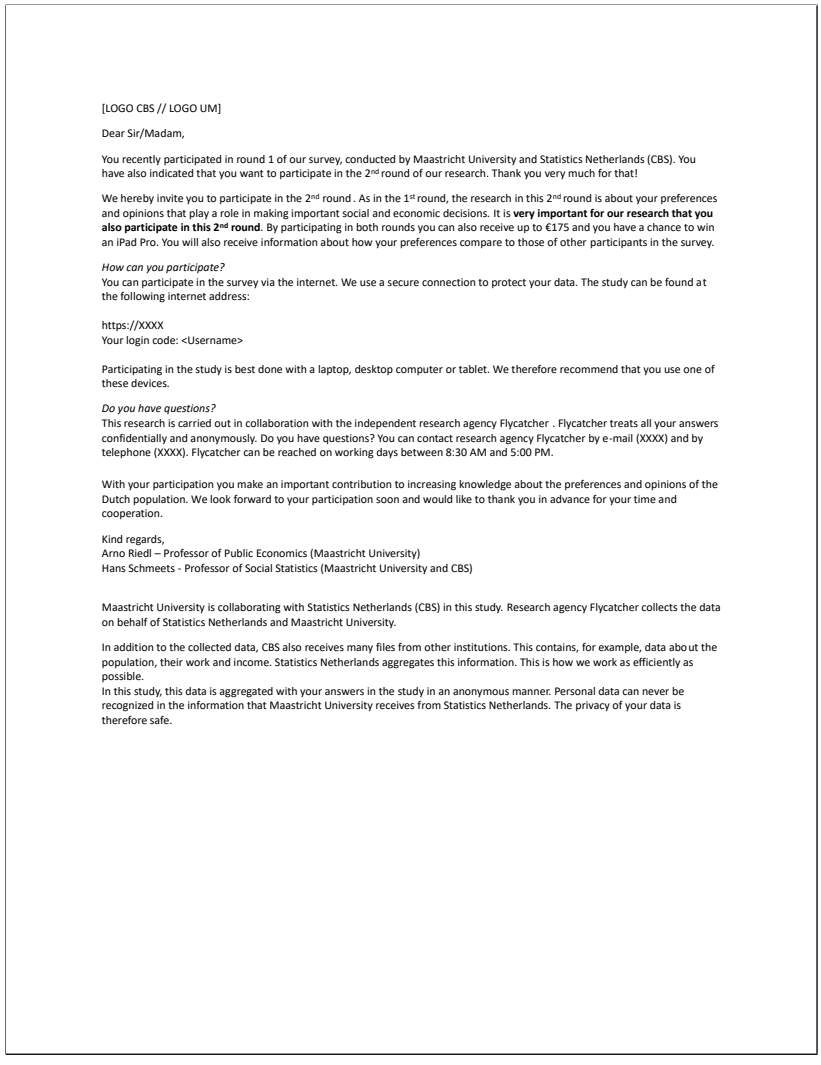
Do you have questions?
This research is being carried out in collaboration with the independent research agency Flycatcher. Flycatcher treats all your answers confidentially and anonymously. Do you have questions? You can contact research agency Flycatcher by e-mail (XXXX) and by telephone (XXXX). Flycatcher can be reached on working days between 8:30 AM and 5:00 PM.

You make an important contribution by participating in our research. We look forward to your participation soon and thank you for your time and cooperation.

Kind regards,
Arno Riedl – Professor of Public Economics (Maastricht University)
Hans Schmeets - Professor of Social Statistics (Maastricht University and CBS)

Maastricht University is collaborating with Statistics Netherlands (CBS) in this study. Research agency Flycatcher collects the data on behalf of Statistics Netherlands and Maastricht University.
In addition to the collected data, CBS also receives many files from other institutions. This contains, for example, data on population, work and income. Statistics Netherlands aggregates this information. In this way we work as economically as possible.
In this study, this data is aggregated with your answers in the study in an anonymous manner. Personal data can never be recognized in the information that Maastricht University receives from Statistics Netherlands.

Figure B1: Invitation Letter Wave 1 (Translated from Dutch)



[LOGO CBS // LOGO UM]

Dear Sir/Madam,

You recently participated in round 1 of our survey, conducted by Maastricht University and Statistics Netherlands (CBS). You have also indicated that you want to participate in the 2nd round of our research. Thank you very much for that!

We hereby invite you to participate in the 2nd round . As in the 1st round, the research in this 2nd round is about your preferences and opinions that play a role in making important social and economic decisions. It is **very important for our research that you also participate in this 2nd round**. By participating in both rounds you can also receive up to €175 and you have a chance to win an iPad Pro. You will also receive information about how your preferences compare to those of other participants in the survey.

How can you participate?
You can participate in the survey via the internet. We use a secure connection to protect your data. The study can be found at the following internet address:

https://XXXX
Your login code: <Username>

Participating in the study is best done with a laptop, desktop computer or tablet. We therefore recommend that you use one of these devices.

Do you have questions?
This research is carried out in collaboration with the independent research agency Flycatcher . Flycatcher treats all your answers confidentially and anonymously. Do you have questions? You can contact research agency Flycatcher by e-mail (XXXX) and by telephone (XXXX). Flycatcher can be reached on working days between 8:30 AM and 5:00 PM.

With your participation you make an important contribution to increasing knowledge about the preferences and opinions of the Dutch population. We look forward to your participation soon and would like to thank you in advance for your time and cooperation.

Kind regards,
Arno Riedl – Professor of Public Economics (Maastricht University)
Hans Schmeets - Professor of Social Statistics (Maastricht University and CBS)

Maastricht University is collaborating with Statistics Netherlands (CBS) in this study. Research agency Flycatcher collects the data on behalf of Statistics Netherlands and Maastricht University.

In addition to the collected data, CBS also receives many files from other institutions. This contains, for example, data about the population, their work and income. Statistics Netherlands aggregates this information. This is how we work as efficiently as possible.
In this study, this data is aggregated with your answers in the study in an anonymous manner. Personal data can never be recognized in the information that Maastricht University receives from Statistics Netherlands. The privacy of your data is therefore safe.

Figure B2: Invitation Letter Wave 2 (Translated from Dutch)

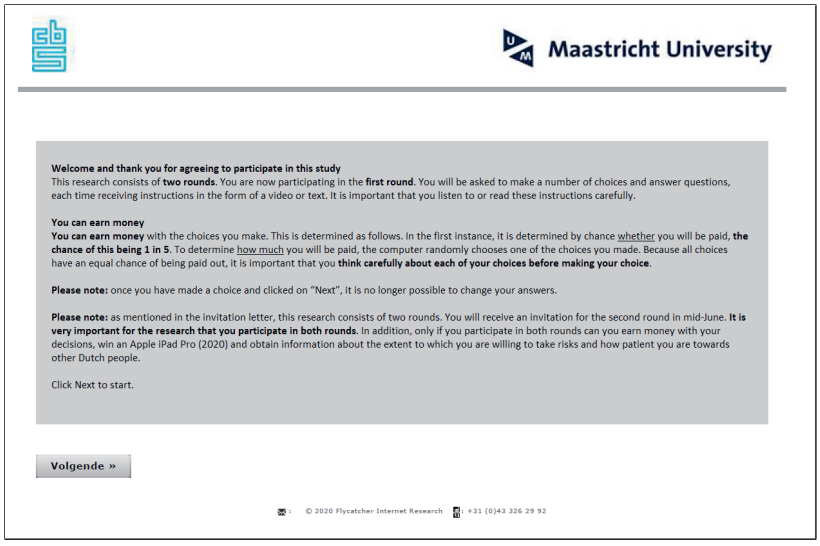


Figure B3: Welcome Screen Wave 1 (Translated from Dutch)

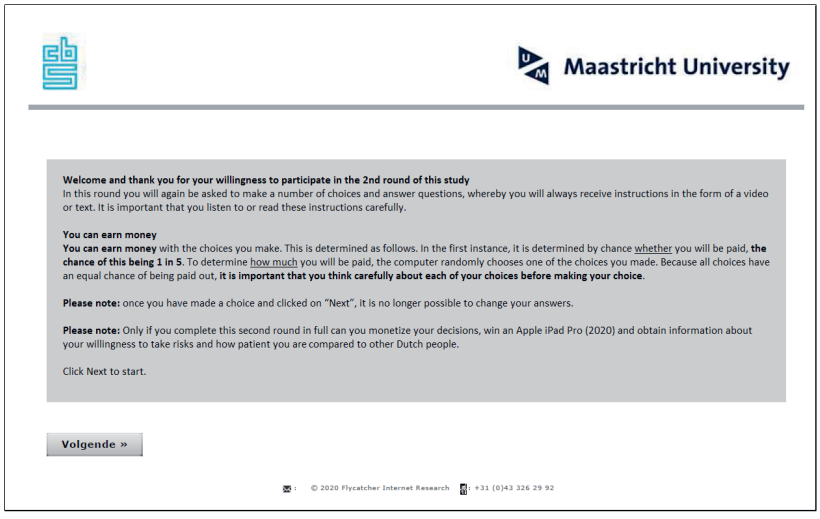


Figure B4: Welcome Screen Wave 2 (Translated from Dutch)

5.C Experimental and Survey Design

5.C.1 Risk Preferences and Ambiguity Aversion

Convex Time Budget. The CTB measures risk and time preferences simultaneously. We implemented two sets of the CTB, in total participants made 24 decisions. The parameters were identical in both sets, except that the late payout took place after 16 weeks in the first set and after 24 weeks in the second set. Table C1 summarizes the parameters that were used.

Table C1: CTB Parameters Set 1

Task	t	k	a_t	a_{t+k}	p_{t+k}	EV(a_{t+k})	1+r	1+r′
#1	8	16	€75	€75.00	1	€75.00	1.00	1.00
#2	8	16	€75	€79.50	1	€79.50	1.06	1.06
#3	8	16	€75	€93.00	1	€93.00	1.24	1.24
#4	8	16	€75	€83.40	0.9	€75.00	1.11	1.00
#5	8	16	€75	€88.35	0.9	€79.50	1.18	1.06
#6	8	16	€75	€103.35	0.9	€93.00	1.38	1.24
#7	8	16	€75	€107.10	0.7	€75.00	1.43	1.00
#8	8	16	€75	€113.55	0.7	€79.50	1.51	1.06
#9	8	16	€75	€132.75	0.7	€93.00	1.77	1.24
#10	8	16	€75	€150.00	0.5	€75.00	2.00	1.00
#11	8	16	€75	€159.00	0.5	€79.50	2.12	1.06
#12	8	16	€75	€186.00	0.5	€93.00	2.48	1.24

Notes: t=delay period early date in weeks, k=delay period late date in weeks, a_t=amount available at the early date, a_{t+k}= amount available at the late date, p_{t+k}=probability that the payment at the late date is actually paid out, EV(a_{t+k})=expected value of the amount available at the late date, 1+r=interest rate over the delay period not adjusted for risk, 1+r′= interest rate over the delay period adjusted for risk. Set 2 is identical, except that k=24.

The decision tasks were presented with information on the dates, probabilities, and possible allocations on one screen, using colors for clarity. Figure C1 shows an example of such a decision screen. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure C2 shows the screen with instructions and Figure C3 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

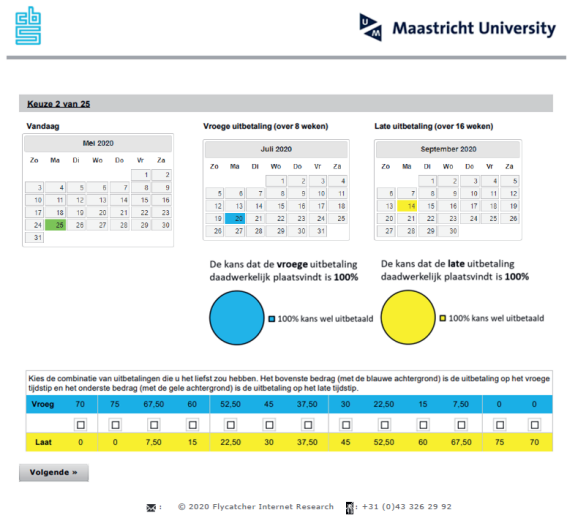


Figure C1: Example Decision Screen CTB

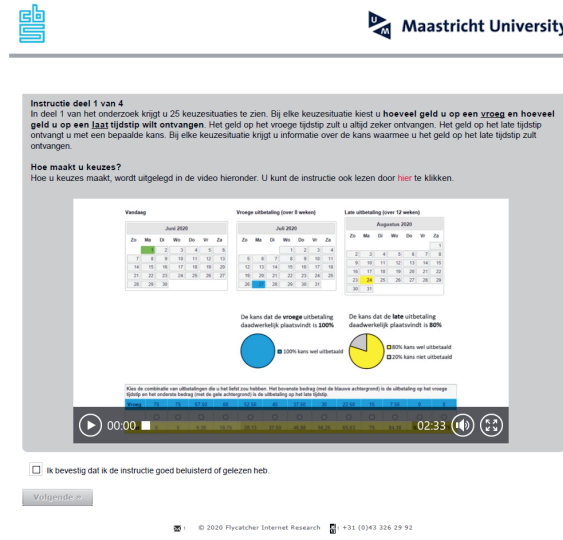


Figure C2: Instructions Screen CTB

Instructions Part [1/4]

In part 1 of the study, you will be presented with 24 decision situations. In each decision situation, you choose **how much money you want to receive at an "early" and how much money you want to receive at a "late" time**. You will always receive the money at the early time with certainty. You will receive the money at the late time with a certain probability. In each decision situation, you will get information about the probability with which you will receive the money at the late time.

How do you make choices?

How you make choices is explained using the example below. The example shows a decision situation in which you are asked to divide a sum of money between an amount of money at an early time (in this example July 27) and an amount of money at a late time (in this example August 24). The times will be different in the choices you make later.

The calendars indicate times relevant to your choice. Today (June 1 in this example) is highlighted in green. The time of the early payout in each decision situation is exactly 8 weeks from today and is marked in blue. The time of the late payout in this example is 12 weeks from today and is highlighted in yellow. **The time of the late payment may differ between decision situations.**

Below the calendars you will see the probability of actually receiving the money at the late time. In this example, this probability is 80% (i.e. a probability of 8 in 10). **This probability can differ between decision situations.**

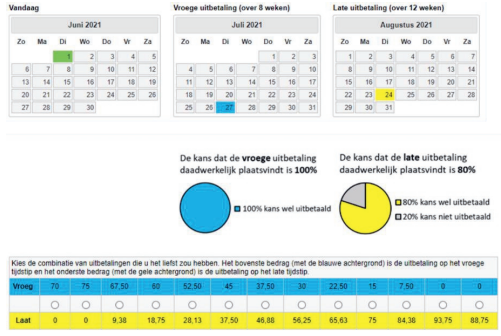
At the bottom of the page you can see the possible divisions of the amount of money in this example. The top amount (with the blue background) shows the amount of money you will receive at the early time. The bottom amount (with the yellow background) shows the amount of money you will receive at the late time with a certain probability.

Explanation of payments in this example. Do you choose:

70 ◉ 0 then you would receive **€70** at the early time (27 July) and receive **€0** at the late time (24 August)

30 ◉ 56,63 then you would receive **€30** at the early time (27 July) and receive **€56,63** at the late time (24 August) and is the probability that you receive the money at the late time 80%.

0 ◉ 93,75 then you would receive **€0** at the early time (27 July) and receive **€93,75** at the late time (24 August) and is the probability that you receive the money at the late time 80%.



Kies de combinatie van uitbetalingen die u het liefst zou hebben. Het bovenste bedrag (met de blauwe achtergrond) is de uitbetaling op het vroege tijdstip en het onderste bedrag (met de gele achtergrond) is de uitbetaling op het late tijdstip.

Vroeg	70	75	67,50	60	52,50	45	37,50	30	22,50	15	7,50	0	0
	○	○	○	○	○	○	○	○	○	○	○	○	○
Laat	0	0	9,38	18,75	28,13	37,50	46,88	56,25	65,63	75	84,38	93,75	88,75

Figure C3: Written Instructions CTB (Translated from Dutch)

Multiple Price List Risk Preferences. Tables C2 to C6 show the parameters for the MPLs used to elicit risk preferences.

Table C2: MPL Risk List 1

	Option A					Option B				
	p	€	p	€	EV(A)	p	€	p	€	EV(B)
#1	0.1	80	0.9	64	€66	0.1	154	0.9	4	€19
#2	0.2	80	0.8	64	€67	0.2	154	0.8	4	€34
#3	0.3	80	0.7	64	€69	0.3	154	0.7	4	€49
#4	0.4	80	0.6	64	€70	0.4	154	0.6	4	€64
#5	0.5	80	0.5	64	€72	0.5	154	0.5	4	€79
#6	0.6	80	0.4	64	€74	0.6	154	0.4	4	€94
#7	0.7	80	0.3	64	€75	0.7	154	0.3	4	€109
#8	0.8	80	0.2	64	€77	0.8	154	0.2	4	€124
#9	0.9	80	0.1	64	€78	0.9	154	0.1	4	€139
#10	1	80	0	64	€80	1	154	0	4	€154

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table C3: MPL Risk List 2

	Option A					Option B				
	p	€	p	€	EV(A)	p	€	p	€	EV(B)
#1	0.1	99	0.9	41	€47	0.1	134	0.9	19	€31
#2	0.2	99	0.8	41	€53	0.2	134	0.8	19	€42
#3	0.3	99	0.7	41	€58	0.3	134	0.7	19	€54
#4	0.4	99	0.6	41	€64	0.4	134	0.6	19	€65
#5	0.5	99	0.5	41	€70	0.5	134	0.5	19	€77
#6	0.6	99	0.4	41	€76	0.6	134	0.4	19	€88
#7	0.7	99	0.3	41	€82	0.7	134	0.3	19	€100
#8	0.8	99	0.2	41	€87	0.8	134	0.2	19	€111
#9	0.9	99	0.1	41	€93	0.9	134	0.1	19	€123
#10	1	99	0	41	€99	1	134	0	19	€134

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table C4: MPL Risk List 3

	Option A			Option B				
	p	€	EV(A)	p	€	p	€	EV(B)
#1	1	52	€52	0.5	30	0.5	130	€80
#2	1	57	€57	0.5	30	0.5	130	€80
#3	1	63	€63	0.5	30	0.5	130	€80
#4	1	68	€68	0.5	30	0.5	130	€80
#5	1	73	€73	0.5	30	0.5	130	€80
#6	1	78	€78	0.5	30	0.5	130	€80
#7	1	82	€82	0.5	30	0.5	130	€80
#8	1	88	€88	0.5	30	0.5	130	€80
#9	1	94	€94	0.5	30	0.5	130	€80
#10	1	101	€101	0.5	30	0.5	130	€80

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table C5: MPL Risk List 4

	Option A			Option B				
	p	€	EV(A)	p	€	p	€	EV(B)
#1	1	39	€39	0.33	20	0.67	110	€80
#2	1	46	€46	0.33	20	0.67	110	€80
#3	1	56	€56	0.33	20	0.67	110	€80
#4	1	64	€64	0.33	20	0.67	110	€80
#5	1	70	€70	0.33	20	0.67	110	€80
#6	1	75	€75	0.33	20	0.67	110	€80
#7	1	79	€79	0.33	20	0.67	110	€80
#8	1	84	€84	0.33	20	0.67	110	€80
#9	1	88	€88	0.33	20	0.67	110	€80
#10	1	93	€93	0.33	20	0.67	110	€80

Notes: EV(A) and EV(B) list the expected value of the related lottery.

Table C6: MPL Risk List 5

	Option A					Option B				
	p	€	p	€	EV(A)	p	€	p	€	EV(B)
#1	0.5	90	0.5	70	€80	0.5	103	0.5	35	€69
#2	0.5	90	0.5	70	€80	0.5	109	0.5	35	€72
#3	0.5	90	0.5	70	€80	0.5	115	0.5	35	€75
#4	0.5	90	0.5	70	€80	0.5	122	0.5	35	€79
#5	0.5	90	0.5	70	€80	0.5	128	0.5	35	€82
#6	0.5	90	0.5	70	€80	0.5	131	0.5	35	€83
#7	0.5	90	0.5	70	€80	0.5	138	0.5	35	€87
#8	0.5	90	0.5	70	€80	0.5	153	0.5	35	€94
#9	0.5	90	0.5	70	€80	0.5	170	0.5	35	€103
#10	0.5	90	0.5	70	€80	0.5	186	0.5	35	€111

Notes: EV(A) and EV(B) list the expected value of the related lottery.

The decision tasks were presented in lists of binary choices with information about the probabilities and outcomes. Figure C4 shows an example of a risk MPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure C5 shows the screen with instructions and Figures C6 and C7 show the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

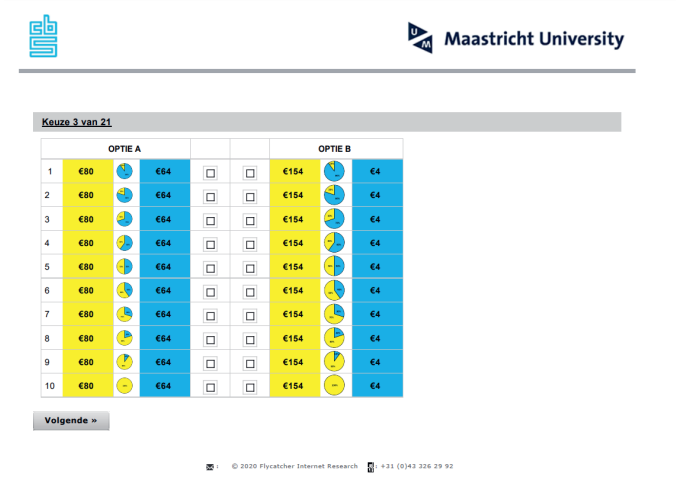


Figure C4: Example Decision Screen MPL Risk

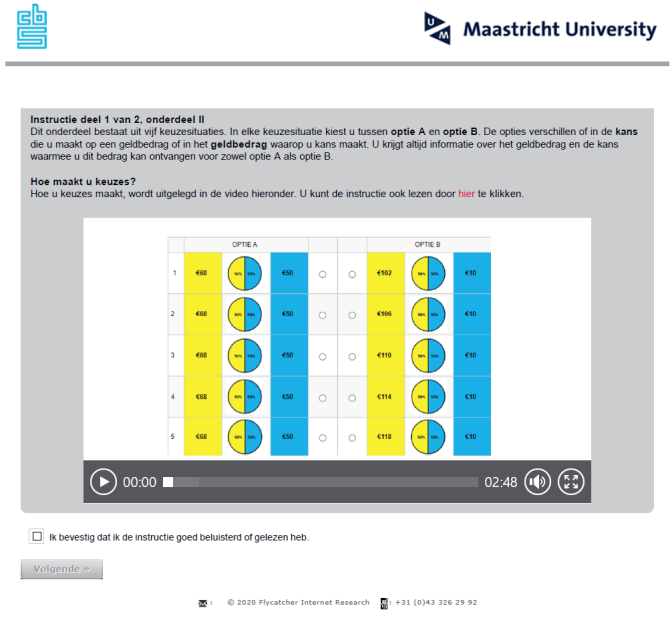


Figure C5: Instructions Screen MPL Risk

Instructions part [1.2/2]
This part consists of five decision situations. In each decision situation you choose between **option A** and **option B**. The options differ either in the **probability** of earning a sum of money or in the **amount** of money that you can earn with a certain probability. You will always receive information about the amount of money and the chance with which you can receive this amount for both option A and option B.

How do you make choices?
How you make choices is explained using the two examples below.

Decision situation Type 1
The screen shows a decision situation in which you are asked to make a choice between **option A** and **option B** in **each row** (in this example 1 to 5).

In this example, **Option A is the same in every row**. In this option you will see two amounts, in this example **€68** (the amount with the yellow background) and **€50** (the amount with the blue background). If you choose option A, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts. In this example, **the probability of receiving €68 is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €50 is 50%** (i.e. a 5 in 10 chance).

In this example, **Option B is different in each row**. In this option you will see two amounts in each row, in this example **€102 or more** (the amount with the yellow background) and **€10** (the amount with the blue background). If you choose option B, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts. In this example, **the probability of receiving €102 or more is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €10 is 50%** (i.e. a 5 in 10 chance).

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

On the next page are instructions for the example of Decision Situation Type 2.

Figure C6: Written Instructions MPL Risk Page 1 (Translated from Dutch)

Decision situation Type 2
The screen shows a decision situation in which you are asked to make a choice between **option A** and **option B** in **each row** (in this example 1 to 5).

Option A is different in each row. In this option you will see two amounts, in this example **€68** (the amount with the yellow background) and **€50** (the amount with the blue background). If you choose option A, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts and differs per row. For example, in row 1, the top row, **the probability of receiving €68 is 10%** (i.e. a 1 in 10 chance) and **the probability of receiving €50 is 90%** (i.e. a 9 in 10 chance). For example, in row 5, the bottom row, **the probability of receiving €68 is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €50 is 50%** (i.e. a 5 in 10 chance).

Option B is different in each row. In this option you see two different amounts than in option A, in this example **€106** (the amount with the yellow background) and **€10** (the amount with the blue background). If you choose option B, you will receive one of these amounts with a certain probability. This probability is stated in the middle of the two amounts and differs per row. The probability of receiving the amount with the yellow or blue background are the same in option A as in option B in each row. For example, in row 1, the top row, **the probability of receiving €106 is 10%** (i.e. a chance of 1 in 10) and **the probability of receiving €10 is 90%** (i.e. a 9 in 10 chance). For example, in row 5, the bottom row, **the probability of receiving €106 is 50%** (i.e. a 5 in 10 chance) and **the probability of receiving €10 is 50%** (i.e. a 5 in 10 chance).

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

Figure C7: Written Instructions MPL Risk Page 2 (Translated from Dutch)

Multiple Price List Prudence. Table C7 shows the parameters used for the MPLs to elicit prudence.

Table C7: MPL-Prudence

	Option A				Option B			
	p	€	p	€	p	€	p	€
#1	0.5	€90 + [0.5∗€20;0.5∗−€20]	0.5	€60	0.5	€90	0.5	€60 + [0.5∗€20;0.5∗−€20]
#2	0.5	€90 + [0.5∗€10;0.5∗−€10]	0.5	€60	0.5	€90	0.5	€60 + [0.5∗€10;0.5∗−€10]
#3	0.5	€90 + [0.5∗€40;0.5∗−€40]	0.5	€60	0.5	€90	0.5	€60 + [0.5∗€40;0.5∗−€40]
#4	0.5	€135 + [0.5∗€30;0.5∗−€30]	0.5	€90	0.5	€135	0.5	€90 + [0.5∗€30;0.5∗−€30]
#5	0.5	€65 + [0.5∗€20;0.5∗−€20]	0.5	€35	0.5	€65	0.5	€35 + [0.5∗€20;0.5∗−€20]

The decision tasks were presented one by one with information about the probabilities and outcomes. Figure C8 shows an example of a prudence MPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure C9 shows the screen with instructions and Figure C10 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

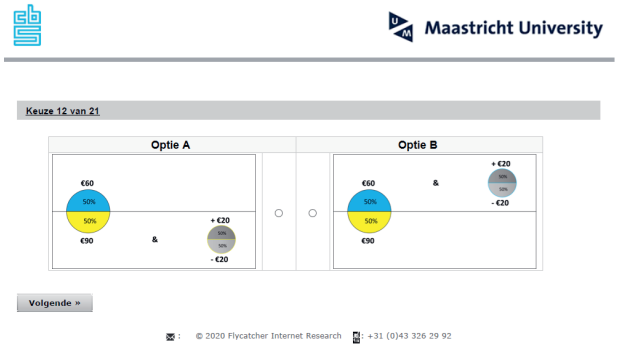


Figure C8: Example Decision Screen MPL Prudence

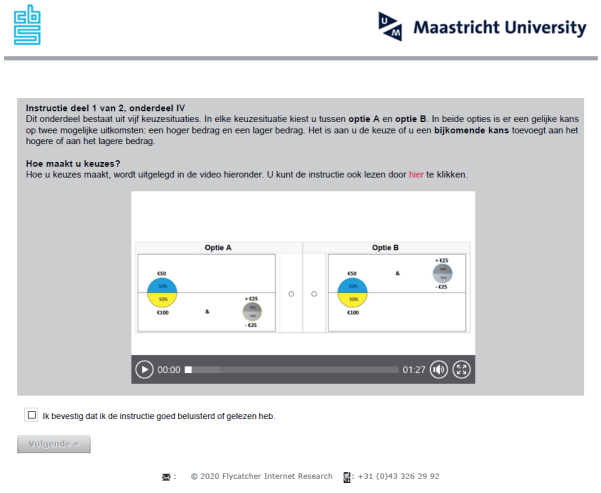


Figure C9: Instructions Screen MPL Prudence

Instructions part [1.4/2]

This part consists of five decision situations. In each decision situation you choose between **option A** and **option B**. In both options there is an equal chance of two possible outcomes: a higher and a lower amount. In addition, in both options there is an **additional** equal chance that one of the amounts will be higher or lower. In option A, this additional chance is added to the higher amount. In option B, this additional chance is added to the lower amount.

How do you make choices?

How you make choices is explained using the example below. The example shows a decision situation in which you are asked to choose between option A and option B.

In both option A and option B you have an equal chance of receiving a higher or lower amount, in this example €50 or €100.

In both option A and option B there is an **additional** equal chance that one outcome will be higher or lower, in this example €25 higher or €25 lower. The difference is that option A has the **additional** chance added to the higher amount, while option B has the **additional** chance added to the lower amount.

You can make your choice by clicking on one of the radio buttons.

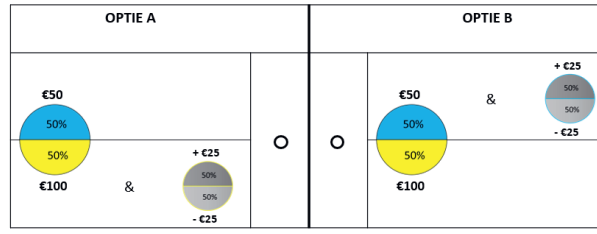


Figure C10: Written Instructions MPL Prudence (Translated from Dutch)

Multiple Price List Temperance. Table C8 shows the parameters used for the MPLs to elicit temperance.

Table C8: MPL-Temperance

	Option A				Option B			
	p	€	p	€	p	€	p	€
#1	0.5	€90 + [0.5∗€30;0.5∗−€30]	0.5	€90 + [0.5∗€30;0.5∗−€30]	0.5	€90	0.5	€90 + [0.5∗€30;0.5∗−€30] + [0.5∗€30;0.5∗−€30]
#2	0.5	€90 + [0.5∗€30;0.5∗−€30]	0.5	€90 [0.5∗€10;0.5∗−€10]	0.5	€90	0.5	€90 + [0.5∗€30;0.5∗−€30] + [0.5∗€10;0.5∗−€10]
#3	0.5	€90 + [0.5∗€30;0.5∗−€30]	0.5	€90 [0.5∗€50;0.5∗−€50]	0.5	€90	0.5	€90 + [0.5∗€30;0.5∗−€30] + [0.5∗€50;0.5∗−€50]
#4	0.5	€30 + [0.5∗€10;0.5∗−€10]	0.5	€30 [0.5∗€10;0.5∗−€10]	0.5	€30	0.5	€30 + [0.5∗€10;0.5∗−€10] + [0.5∗€10;0.5∗−€10]
#5	0.5	€70 + [0.5∗€30;0.5∗−€30]	0.5	€70 [0.5∗€30;0.5∗−€30]	0.5	€70	0.5	€70 + [0.5∗€30;0.5∗−€30] + [0.5∗€30;0.5∗−€30]

The decision tasks were presented one by one with information about the probabilities and outcomes. Figure C11 shows an example of a prudence MPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure C12 shows the screen with instructions and Figure C13 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

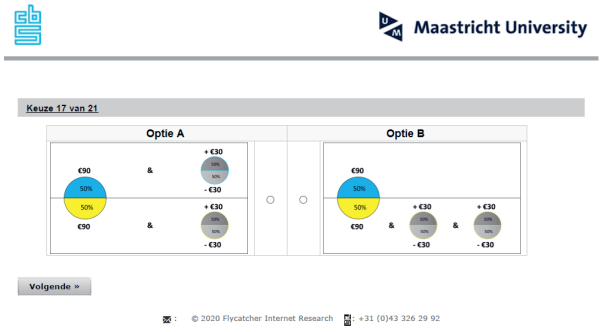


Figure C11: Example Decision Screen MPL Temperance

Figure C12: Instructions Screen MPL Temperance

Instructions part [1.5/2]

This part consists of five decision situations. In each decision situation you choose between **option A** and **option B**. In both options there is an equal chance of two possible outcomes. In addition, there is **twice** an **additional** equal chance that an outcome will be higher or lower. In option A, these additional probabilities are split. In option B, these additional chances are added to the same amount.

How do you make choices?

How you make choices is explained using the example below. The example shows a decision situation in which you are asked to make a choice between option A and option B.

In both option A and option B you have an equal chance of winning an amount, in this example €100.

In both option A and option B there is **twice** an **additional** equal chance that one outcome will be higher or lower, in this example €25 higher or €25 lower. The difference is that with option A the **additional** odds are split, while with option B the **additional** odds are added to the same amount.

You can make your choice by clicking on one of the radio buttons.

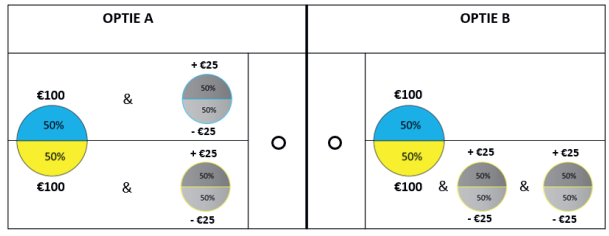


Figure C13: Written Instructions MPL Temperance (Translated from Dutch)

Multiple Price List Ambiguity. Table C9 shows the parameters used for the MPLs to elicit ambiguity aversion.

Table C9: MPL-Ambiguity

	Option A Urn A composition (balls)	Indifference	Option B Urn B composition (balls)
#1	10 red ; 0 blue	0.5∗option A ; 0.5∗option B	Unknown
#2	9 red ; 1 blue	0.5∗option A ; 0.5∗option B	Unknown
#3	8 red ; 2 blue	0.5∗option A ; 0.5∗option B	Unknown
#4	7 red ; 3 blue	0.5∗option A ; 0.5∗option B	Unknown
#5	6 red ; 4 blue	0.5∗option A ; 0.5∗option B	Unknown
#6	5 red ; 5 blue	0.5∗option A ; 0.5∗option B	Unknown
#7	4 red ; 6 blue	0.5∗option A ; 0.5∗option B	Unknown
#8	3 red ; 7 blue	0.5∗option A ; 0.5∗option B	Unknown
#9	2 red ; 8 blue	0.5∗option A ; 0.5∗option B	Unknown
#10	1 red ; 9 blue	0.5∗option A ; 0.5∗option B	Unknown
#11	0 red ; 10 blue	0.5∗option A ; 0.5∗option B	Unknown

Notes: Participants received this MPL twice. In the first list, they were informed that the winning color was red and in the second list, they were informed that the winning color was blue. Participants were also informed that the proportion of red and blue balls in the ambiguous urn stayed the same within each and between both MPLs.

The decision tasks were presented in a list of binary choices with information about the urn composition. Figure C14 shows an example of an ambiguity MPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure C16 shows the screen with instructions and Figure C15 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

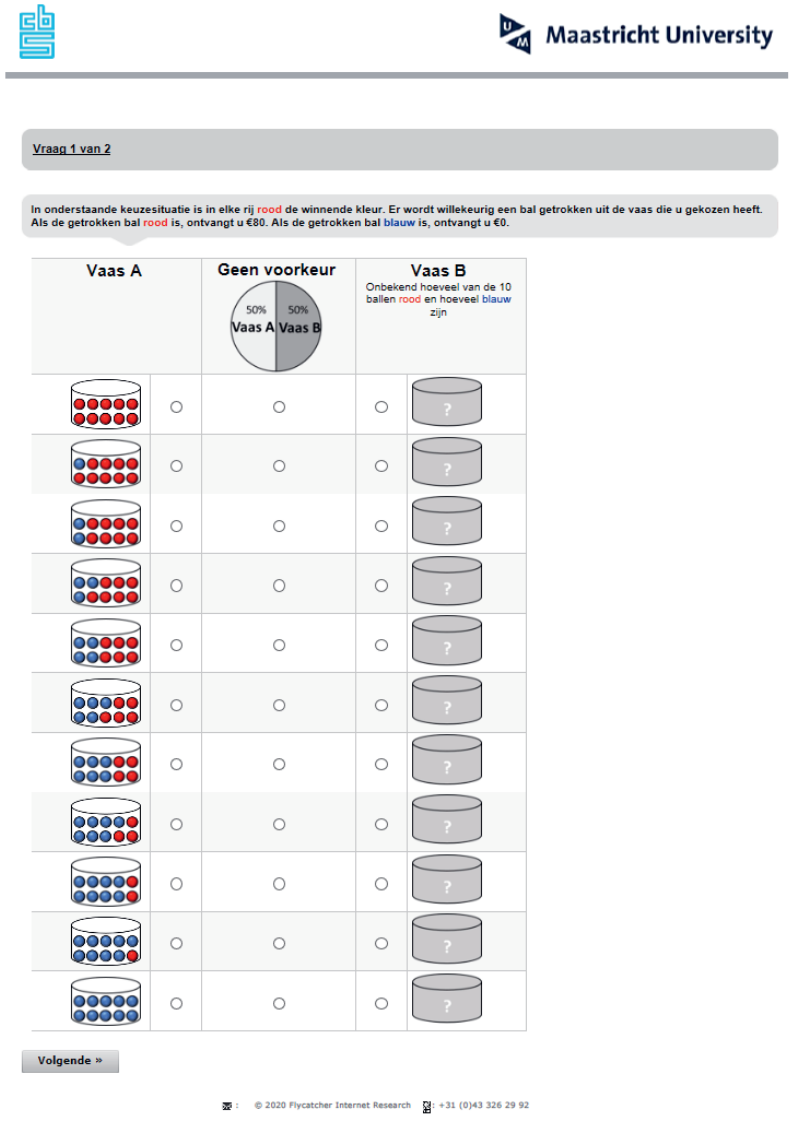
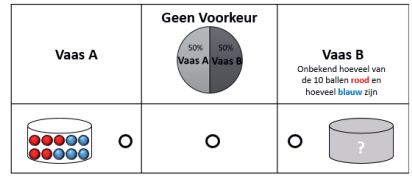


Figure C14: Example Decision Screen MPL Ambiguity

Instructions Part [2/4]

In part 2 of the study, you will be presented with two decision situations. In each decision situation there is always one winning color: **red** or **blue**. You always choose between two urns, **urn A** and **urn B**, each filled with 10 balls. The balls have the color **red** or **blue**. 1 ball is randomly drawn from the urn you have chosen. In case the drawn ball has the winning color, you receive 80 euros. If the drawn ball is not the winning color, you receive 0 euros.



Urn A is transparent: in each choice you can see **exactly** how many of the 10 balls are red and how many are blue. In this example, there are 5 red and 5 blue balls in urn A.

Urn B is opaque: you **do not** know how many of the 10 balls are red and how many are blue. A computer determines the ratio of red and blue balls in urn B once by chance. This could be 10 red balls, 10 blue balls, or anything in between.

The decision situations differ in the number of red and blue balls in urn A. **The content of urn B remains the same for all choices.**

The number of balls of a certain color in a urn determines the probability of choosing this color by a random draw. In this example, there are 5 red and 5 blue balls in the urn. Thus, in a random draw, the probability of getting a red ball is 5 in 10 (i.e. 50%). The chance of getting a blue ball is also 5 in 10 (i.e. 50%).

Your choices

In the choices you are going to make you will be asked to choose between urn A and urn B. You also have the option to choose the option "No Preference". If you choose "No Preference" then the computer will determine by chance (50-50% chance) which urn is chosen.

Figure C15: Written Instructions MPL Ambiguity (Translated from Dutch)

Figure C16: Instructions Screen MPL Ambiguity

Survey Questions. Table C10 shows the wording of the survey questions to elicit risk preferences.

Table C10: Survey Questions Risk Preferences

Risk Preference	0 "not at all willing to take risks" – 10 "fully prepared to take risks"
General	How do you see yourself: Are you generally a person who is fully prepared to take risks or do you try to avoid taking risks?
Domains	People can behave differently in different situations. How would you rate your willingness to take risks in the following areas? How is it …
Finances	… in your personal financial matters?
Occupation	… in your choice of occupation?
Health	… with your health?

Notes: Questions were asked in Dutch. Sources: Risk (Falk et al., 2016, 2022).

5.C.2 Time Preferences, Procrastination, and Self-Control

Convex Time Budget. See Section 5.C.1.

Multiple Price List Time Preferences. Tables C11 and C12 show the parameters used for the MPLs used to elicit time preferences.

Table C11: MPL-Time List 1

	Option A		Option B	
	€	Delay Period	€	Delay Period
#1	75	8 weeks	75	16 weeks
#2	75	8 weeks	76	16 weeks
#3	75	8 weeks	77	16 weeks
#4	75	8 weeks	79	16 weeks
#5	75	8 weeks	81	16 weeks
#6	75	8 weeks	84	16 weeks
#7	75	8 weeks	87	16 weeks
#8	75	8 weeks	91	16 weeks
#9	75	8 weeks	95	16 weeks

Table C12: MPL-Time List 2

	Option A		Option B	
	€	Delay Period	€	Delay Period
#1	75	8 weeks	75	24 weeks
#2	75	8 weeks	76	24 weeks
#3	75	8 weeks	77	24 weeks
#4	75	8 weeks	79	24 weeks
#5	75	8 weeks	81	24 weeks
#6	75	8 weeks	84	24 weeks
#7	75	8 weeks	87	24 weeks
#8	75	8 weeks	91	24 weeks
#9	75	8 weeks	95	24 weeks

The decision tasks were presented in a list of binary choices with information about the delay period and outcomes. Figure C17 shows an example of a time MPL as presented to participants. Before making decisions, participants received video instructions as well as the option to download written instructions in PDF format. Participants were required to watch the entire video or download the written instructions before being able to continue to the decision tasks. Figure C18 shows the screen with instructions and Figure C19 shows the written instructions (translated to English). The video narrated roughly the same text as the written instructions while highlighting the relevant parts of the decision screen.

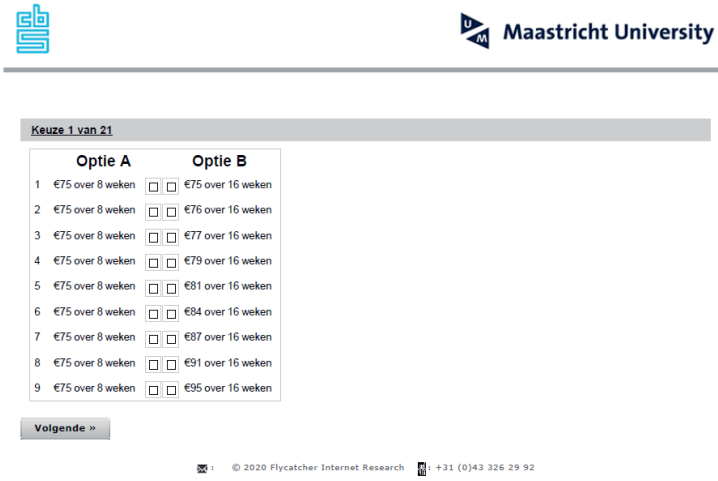


Figure C17: Example Decision Screen tMPL, Version 1

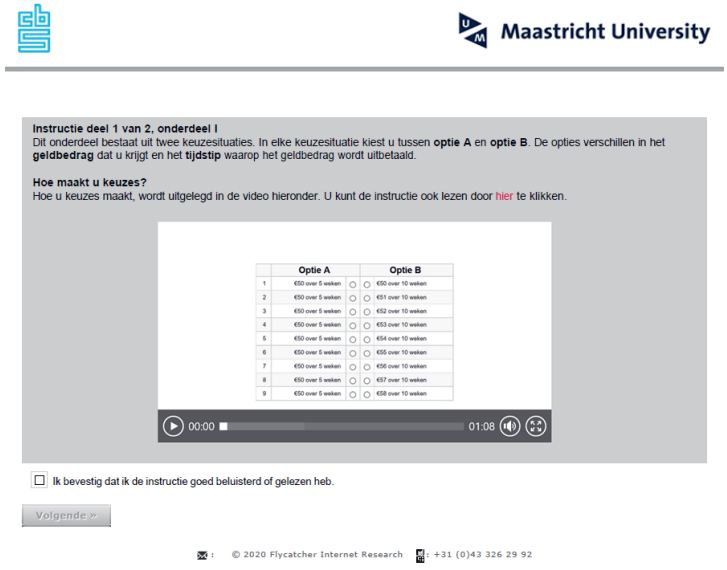


Figure C18: Instructions Screen tMPL

Instructions part [1.1/2]

This part consists of two decision situations. In each decision situation you choose between **option A** and **option B**. The options **differ** in the **amount of money** you receive and the **time** when the amount of money is paid out.

How do you make choices?

How you make choices is explained using the example below. The example shows a choice situation in which you are asked to make **9 choices** between option A and option B.

Option A is the same in every row. If you choose option A in this example, you will receive **€50**. This amount will be paid **in 5 weeks**.

Option B differs in each row. If you choose option B in this example, you will receive **€50 or more**. This amount will be paid **in 10 weeks**.

You make your choices by clicking on one of the radio buttons. **Note: you must make a choice in each row.**

	Optie A			Optie B
1	€50 over 5 weken	O	O	€50 over 10 weken
2	€50 over 5 weken	O	O	€51 over 10 weken
3	€50 over 5 weken	O	O	€52 over 10 weken
4	€50 over 5 weken	O	O	€53 over 10 weken
5	€50 over 5 weken	O	O	€54 over 10 weken
6	€50 over 5 weken	O	O	€55 over 10 weken
7	€50 over 5 weken	O	O	€56 over 10 weken
8	€50 over 5 weken	O	O	€57 over 10 weken
9	€50 over 5 weken	O	O	€58 over 10 weken

Figure C19: Written Instructions tMPL

Survey Questions. Table C13 shows the wording of the survey questions to elicit time preferences, procrastination, and self-control.

Table C13: Survey Questions Time Preferences, Procrastination, and Self-Control

Time Preference	0 "completely unwilling" – 10 "completely willing"
Near Future	How willing are you to give up something that is beneficial for you today in order to benefit more from that in the near future?
Far Future	How willing are you to give up something that is beneficial for you today in order to benefit more from that in the far future?
Procrastination	0 "does not describe me at all" – 10 "describes me perfectly"
	I have a tendency to delay tasks even though I know it would be better to do them right away.
Self-Control	1 "not at all" – 5 "very much" ($\alpha = .80$)
Question 1	I am good at resisting temptation.
Question 2	I have a hard time breaking bad habits. (R)
Question 3	I am lazy. (R)
Question 4	I say inappropriate things. (R)
Question 5	I do certain things that are bad for me, if they are fun. (R)
Question 6	I refuse things that are bad for me.
Question 7	I wish I had more self-discipline. (R)
Question 8	People would say that I have iron self-discipline.
Question 9	Pleasure and fun sometimes keep me from getting work done. (R)
Question 10	I have trouble concentrating. (R)
Question 11	I am able to work efficiently towards long-term goals.
Question 12	Sometimes I can't stop myself from doing something, even if I know it is wrong. (R)
Question 13	I often act without thinking through all the alternatives. (R)

Notes: Questions were asked in Dutch. R indicates that the scale is reversed. α refers to Cronbach's alpha (Cronbach, 1951), which provides an indication of scale reliability. Sources: Time, Procrastination (Falk et al., 2016, 2022), Self-Control (Tangney et al., 2004).

5.C.3 Solidarity Preferences and Altruism

Survey Question. Table C14 shows the wording of the survey question to elicit altruism.

Table C14: Survey Question Altruism

Altruism	0 "completely unwilling" – 10 "completely willing"
	How willing are you to give to good causes without expecting anything in return?

Notes: Questions were asked in Dutch. Sources: Altruism (Falk et al., 2016, 2022)

Solidarity Game. For the solidarity game, participants only received written instructions. Figure C20 shows the screen with instructions and Figure C21 shows the decision screen as presented to participants.

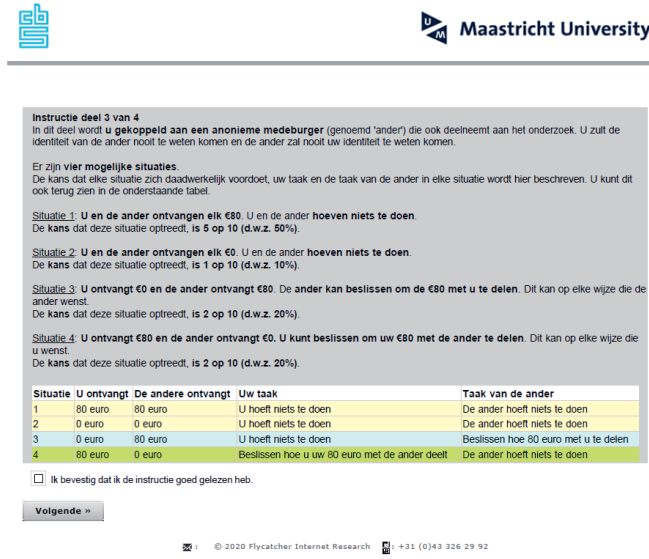


Figure C20: Instructions Screen Solidarity Game

Figure C21: Decision Screen Solidarity Game

5.C.4 Trust and Reciprocity

Survey Questions. Table C15 shows the wording of the survey questions to elicit trust and reciprocity.

Table C15: Survey Questions Trust and Reciprocity

Generalized Trust	0 "You cannot be careful enough" or 1 "Most people can be trusted"
	In general, do you think that most people can be trusted or do you think that one cannot be too careful when dealing with people?
Institutional Trust	1 "no trust at all" – 4 "a lot of trust"
	Could you please indicate for each of the following institutions how much trust you have in it? How much trust do you have in:
Public	... justice system
	... police
	... the Lower House of Parliament
	... science
Private	... banks
	... large corporations
Pension	... pension funds
	... current pension system
	... future pension system [incl. option "don't know"]
Positive Reciprocity	0 "completely unwilling" – 10 "completely willing"
	When someone does me a favor, I am willing to return it
Negative Reciprocity	0 "does not describe me at all" – 10 "describes me perfectly"
	If I am treated very unjustly, I will take revenge at the first occasion, even if there is a cost to do so

Notes: Questions were asked in Dutch. Sources: Trust (Statistics Netherlands, 2012), Reciprocity (Falk et al., 2016, 2022).

5.C.5 Optimism and Overconfidence

Survey Questions. Table C16 shows the wording of the survey questions to elicit optimism and overconfidence.

Table C16: Survey Questions Optimism and Overconfidence

Optimism	0 "not optimistic [pessimistic] at all" – 10 "very optimistic [pessimistic]"
Question 1	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?
Question 2	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?
Overconfidence	0 "0 questions correct" – 5 "5 questions correct"
	In questions 1-5 you have provided answers to questions about financial literacy. How many of the five questions do you think you answered correctly?

Notes: Questions were asked in Dutch. Sources: Optimism (Kemper et al., 2017).

5.C.6 Cognitive Reflection, Financial Literacy, and Financial Management

Survey Questions. Table C17 shows the wording of the survey questions to elicit cognitive reflection, financial literacy, and financial management.

Table C17: Survey Questions Cognitive Reflection, Financial Literacy, and Financial Management

Cognitive Reflection	Open answer
Question 1	A bat and a ball cost €110 in total. The bat costs €100 more than the ball. How much does the ball cost? [correct = 5]
Question 2	If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets? [correct = 5]
Question 3	3. In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the lake, how long would it take the patch to cover half the lake? [correct = 47]
Financial Literacy	Multiple choice
Question 1	Suppose you had €100 in a savings account and the interest rate was 2 percent per year. After 5 years, how much do you think you would have in the account if you left the money to grow? [**more than €102**; exactly €102; less than €102; do not know; prefer not to say]
Question 2	Imagine that the interest rate on your savings account was 1 percent per year and inflation was 2 percent per year. After 1 year, would you be able to buy more than, exactly the same as, or less than today with the money in this account? [more; exactly the same; **less**; do not know; prefer not to say]
Question 3	Do you think the following statement is true or false? "Buying a single company stock usually provides a safer return than a stock mutual fund." [true; **false**; do not know; prefer not to say]
Question 4	Do you think the following statement is true or false? "A 15-year mortgage typically requires higher monthly payments than a 30-year mortgage, but the total interest over the life of the loan will be less." [**true**; false; do not know; prefer not to say]
Question 5	If interest rates rise, what will typically happen to bond prices? [they will rise; **they will fall**; they will stay the same; there is no relationship; do not know; prefer not to say]
Financial Management	1 "completely disagree" – 5 "completely agree" ($\alpha = .61$)
Question 1	I manage my daily financial affairs in a very organized way.
Question 2	I am very impulsive and I am tempted to buy things even when in fact I do not have the money for it. (R)
Question 3	I never pay my bills too late.
Question 4	I rather pay items on credit than waiting until I have saved the money. (R)

Notes: Questions were asked in Dutch. R indicates that the scale is reversed. α refers to Cronbach's alpha (Cronbach, 1951), which provides an indication of scale reliability. Sources: Cognitive Reflection (Frederick, 2005), Financial Literacy (Lusardi & Mitchell, 2014), Financial Management (Antonides et al., 2011).

6
General Discussion

The chapters in this thesis deal with the measurement of preferences in a general population sample of the Netherlands using both revealed and stated preference elicitation methods. Chapter 2 discusses the validity of risk preference elicitation methods. Chapters 3 and 4 concern the stability of risk, time, and social preference measurements. Chapter 5 compares self-employed workers and employees on their preferences and traits. Below, the findings from each study are discussed.

Chapter 2 examines the convergent and external validity of revealed and stated risk preference elicitation methods while controlling for measurement error. We find that the correlation between methods improves when controlling for measurement error. This provides an indication that not accounting for measurement errors can partly explain the lack of convergent validity among revealed risk preference methods found in previous studies. At the same time, we find clear differences between stated and revealed methods when it comes to their external validity. Revealed methods do not correlate well with risk-related field behavior, even when controlling for measurement error. Stated methods correlate with most types of risk-related field behavior and correlations are of economic significance. Thus, measurement error appears insufficient to explain why the external validity of incentivized risk preference elicitation methods is generally found to be low.

It remains an open question why revealed risk preference elicitation methods do not correlate well with field behavior. One potential explanation is that these methods are substantially more complex compared to stated methods. However, this conjecture is at odds with the generally high understanding that participants in our study exhibit. Another explanation is that the stakes that we used for the incentivized methods were too small and hence behavior in these tasks does not necessarily relate to the type of field behavior that we investigate. The stakes that we used, however, were relatively sizeable, and higher stakes would be substantially more costly. The findings could also be specific to the elicitation methods in our study. While we consider several popular elicitation methods from the literature, many others are available. More research is needed that examine other elicitation methods and that further investigate why the external validity of revealed risk preference elicitation methods appears to be low.

Chapter 3 investigates the impact of personal life events on revealed and stated risk, time, and social preferences. We find that recently experiencing a personal life event has some short-run impact on our preference measures. In particular, recently married individuals behave slightly more pro-social in

our incentivized measure, but do not differ from singles and other married people in terms of their risk and time preferences. Individuals who recently divorced take fewer risks in our incentivized measures and assess themselves as somewhat more patient, but do not differ in their social preferences. Individuals who recently got a child take slightly more risks in only one of our incentivized experiments and do not differ in their self-assessed willingness to take risks. Recent parenthood is also associated with slightly higher stated patience, but no effect is found for social preferences. An interesting finding is that the results for stated and revealed preferences largely do not coincide. This suggests that the difference between stated and revealed risk preferences needs to be explored more carefully.

There are some limitations to the study described in Chapter 3 that should be acknowledged. First, we rely on cross-sectional data and hence can only account to a limited extent for individual heterogeneity. A more desirable research design would be to follow individuals over a longer period while repeatedly eliciting preferences, as is being done by several studies using only stated preferences. Second, our data contains a relatively small number of individuals who experience specific life events. This implies that we cannot precisely estimate the effect sizes and that we have little power to detect an effect even if it exists. It may thus be the case that we underestimate the impact of life events. Third, we only consider a number of important life events. Arguably, there are many events that could have a similar or even bigger impact on people's lives, such as the death of a child or spouse, a serious illness, or a major career change. Our dataset is not large enough to analyze such events and, given that the effects of life events on preferences may vary substantially depending on the specific event and the measure that we use, we cannot straightforwardly generalize our findings to other life events. Hence, more systematic research is needed to assess the relevance of a broad range of personal life events on preferences.

Chapter 4 examines the impact of the COVID-19 crisis on risk, time, and social preferences. Our findings suggest that preferences remain remarkably stable throughout the pandemic. In particular, we do not observe robust differences in any of the risk, ambiguity, time, and social preference measures when comparing responses from independent samples right before the pandemic and during two lockdown phases in the Netherlands. We also examine whether results change when we take into account individual heterogeneity in exposure to the COVID-19 crisis. We find that differences in exposure to the crisis in the health domain and beliefs about the duration of the crisis do not seem to affect preferences. Some shifts in risk, ambiguity, and social pref-

erences are observed among participants with high exposure to the crisis in the financial or career domain. By and large, however, the effects of individual exposure to the crisis on preferences turn out to be limited in our setting. The results only allow for conclusions concerning medium-term effects, and we acknowledge that it is only one brick in understanding the dynamics of the stability of preferences during a crisis. Moreover, the findings should be viewed as complementary to the mixed results that other studies found. More research is needed to investigate the roots of the differences between studies to get a better understanding of the nature of preferences and their stability in the case of exogenous shocks.

Chapter 5 provides direct evidence of differences between self-employed workers and employees on their preferences and traits. We find that self-employed workers state that they are more willing to take risks and also take slightly more risks in the incentivized experiments, compared to employees. They also exhibit stronger pro-social preferences in the incentivized experiment and, in line with that, state to be somewhat more altruistic (albeit not statistically significant when controlling for demographic characteristics). In addition, self-employed workers state to be more patient compared to employees but behave less or equally patient in the incentivized experiments. The results from revealed and stated preference methods thus largely coincide for risk and social preferences but differ for time preferences. Self-employed workers also state to be more optimistic, more willing to reciprocate negatively, and have lower financial management skills, compared to employees. Moreover, they have lower trust in institutions and, interestingly, higher trust in other people. No differences are found in other preferences and traits that we consider when controlling for demographic characteristics. The results provide new input to the question "Who are the self-employed?". Importantly, we find that many of our results are in line with findings from previous literature. At the same time, we contribute to the literature with results that are novel or contrast previous studies, such as our findings on time preferences, self-control, overconfidence, financial management, and financial literacy.

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Impact Paragraph

In this thesis, methods from behavioral economics and psychology are used to elicit preferences of Dutch self-employed workers and employees. In addition to contributing to the academic literature, the thesis provides insights relevant to ongoing policy debates in the Netherlands surrounding self-employment and the new pension agreement. The work is relevant for researchers and practitioners interested in risk preferences and the role of measurement error (Chapter 2), the role of life events on risk, time, and social preferences (Chapter 3), the effect of exogenous crises, such as COVID-19, on risk, time, and social preferences (Chapter 4), and the differences between self-employed workers and employees in the Netherlands in terms of their preferences and traits (Chapter 5).

The study "The Validity of Risk Preference Elicitation Methods" in Chapter 2 addresses whether several commonly used stated and revealed risk preference elicitation methods correlate with each other (convergent validity) and with behavior in the field (external validity). A key contribution of the study is that we apply the recently proposed "obviously related instrumental variable approach" to control for measurement error. Our results suggest that controlling for measurement error improves the correlation between revealed risk preference elicitation methods, but that the external validity of these methods remains low. At the same time, stated methods perform better than revealed methods on both convergent and external validity. The findings contribute to an ongoing academic discussion about the validity of risk preference elicitation methods and the differences between revealed and stated methods. Most importantly, it suggests that measurement error alone is insufficient to explain why the external validity of revealed risk preference elicitation methods is generally found to be low.

The results from Chapter 2 are highly relevant for ongoing policy debates in the Netherlands surrounding the measurement of risk preferences. Eliciting risk preferences is required by law in the Netherlands for financial institutions that offer financial products and services.[1] Moreover, in the recent pension agreement it is stated that pension funds should invest according to

[1] Similar recommendations are made by the Financial Industry Regulatory Authority in the US (see https://bit.ly/45bNJhr, last retrieved August 17, 2023) and the European Securities and Markets Authority (see https://bit.ly/3qqi5xG, last retrieved August 17, 2023).

the risk preferences of their participants.[2] Pension funds, therefore, have the responsibility to measure risk preferences accurately to ensure that the investment policies are in the best interest of the pension participants. While measuring risk preferences is a requirement, the regulations do not stipulate how to measure them. Our results suggest that more research is needed to assess the validity of revealed risk preference elicitation methods before they can properly be used by practitioners.

The studies "Personal Life Events and the Stability of Preferences" in Chapters 3 and "The Robustness of Preferences During a Crisis" in Chapter 4 investigate the stability of preferences after personal life events and during the COVID-19 crisis, respectively. Stable preferences are often implicitly assumed, but it is important that this assumption is validated empirically. From a practical point of view, studying temporal stability is relevant because it gives input into when preferences should be elicited and whether they should be re-elicited at some point in time. The results from both studies are encouraging from a theoretical and a practical point of view, as we find that preferences generally remain stable. However, as discussed in these chapters, it is important that more research is undertaken, in order to arrive at more conclusive results.

The study "A Comparison of Dutch Self-Employed Workers and Employees" in Chapter 5 addresses the question "Who are the self-employed?" and provides insight into the preferences and traits of self-employed workers in the Netherlands compared to employees. The work provides input for policy debates surrounding self-employment in the Netherlands. Over the past decade, the number of self-employed increased, particularly due to a growing group of solo self-employed. As the number of self-employed keeps rising, there is a growing concern about the socioeconomic position of this group, including the adequacy of their retirement savings. In response to this concern, the adequacy of retirement savings by the self-employed is addressed in the proposed pension reform in the Netherlands. In particular, the new pension agreement contains a clause that stipulates that pension funds may experiment with the simplification of retirement savings for the self-employed in the second pillar.[3] Having a better understanding of who the Dutch self-employed are provides critical insights for the design and success of these experiments. For example, self-employed workers may prefer different investment strategies than employees given their higher stated willingness to

[2]See https://bit.ly/3KL8Tur (last retrieved August 17, 2023).
[3]See https://bit.ly/3E1lLZW (last retrieved August 17, 2023).

take risks and optimism. Moreover, it will be important to address the lower levels of trust in pension institutions that self-employed workers have to increase the willingness of this group in order to voluntarily join such experiments.

Public debate and promotion of Maastricht University (UM)

The research in this thesis has been presented and discussed at research meetings and seminars at UM (2019-2023), Statistics Netherlands (2022), Caltech (2022), and the University of Kassel (2023). The work has also been presented at (inter)national conferences, including TIBER (Tilburg, 2021), CESifo Summer Institute (Venice, 2022), Foundations of Utility and Risk Conference (Gent, 2022), Spring School in Behavioral Economics (San Diego, 2022), Economic Science Association Meetings (Santa Barbara, 2022; Lyon 2023), and Maastricht Behavioral and Experimental Policy Symposium (Maastricht, 2023). In addition, presentations and discussions were held at practitioner events, including the Netspar Pension Day (Online 2020-2021; Utrecht, 2023), Netspar Pension Workshop (Online, 2021; Leiden, 2023), Netspar After Lunch Meetings (Online, 2021-2022), Behavioural Insights Day (Online, 2020), ICPM Virtual Fall Discussion Forum Session (Online, 2021), Society for Risk Analysis Europe 6th Benelux Annual Meeting (Bilthoven, 2022), UM-SBE Science Slam (Maastricht, 2023), and Nederlandse Economendag (Den Haag, 2023).

The work in this thesis has been published by Netspar as industry and discussion papers, which are targeted at financial institutions and researchers, and has been picked up by the popular press. In particular, Chapters 2 and 4 have been published as Netspar Discussion Papers (Bokern et al., 2023; Bokern, Linde, Riedl, & Werner, 2021). Chapter 3 is based on a Netspar Design Paper (Bokern et al., 2022b), which was featured in PensioenPro (van Alphen, 2022) as well as "Het Financieele Dagblad" (van Hoeflaken, 2022). Chapter 5 is based on a Netspar Design Paper (Bokern et al., 2022a). Moreover, a related publication (not included in this thesis) in which we review selected literature on risk preference elicitation methods and their external validity (Bokern, Linde, Riedl, Schmeets, et al., 2021) was also covered by PensioenPro (van Wijk, 2021).

Software and data analyses

All data analysis was performed in Stata Version 16.0. The codes are available upon request.

About the author

Paul Bokern was born on the 11th of April 1995 in Geleen, the Netherlands. After receiving his VWO diploma in 2012 from "het Bonnefanten College" in Maastricht, he started studying Economics and Business Economics at Maastricht University. During his bachelor, he spent a semester abroad at LUISS in Rome and completed an internship at Philips in Amsterdam. After obtaining his Bachelor of Science in 2016, he decided to pursue a Master of Science at Maastricht University. In 2017, he graduated with distinction from Human Decision Science with a thesis titled "Psychological pressure of catching up: an empirical study on tennis" under the supervision of Dr. Martin Strobel. Following his newly acquired interest in data analytics, he then decided to pursue a second Master of Science at Maastricht University and graduated *Cum Laude* from Business Intelligence and Smart Services in 2018. His thesis titled "An empirical analysis of changing skill demand on the Dutch labour market" was written during an internship at Etil Research Group under the supervision of Dr. Nalan Baştürk and Jeroen Meuwissen. He started working in the Department of Microeconomics and Public Economics at Maastricht University as a teaching assistant in 2018 and was nominated for the outstanding tutor award 2018-2019. During this time, he also worked as a research assistant for Dr. Giulia Piccillo. In 2019, he became a PhD candidate in the same department under the supervision of Prof. Dr. Arno Riedl, Prof. Dr. Hans Schmeets, Prof. Dr. Peter Werner, and Dr. Jona Linde. As part of his PhD project, he joined Netspar as a junior research fellow and Statistics Netherlands (CBS) as an external researcher. The work of his PhD research is presented in this thesis. In 2022, Paul spent a trimester in the Division of the Humanities and Social Sciences at Caltech at the invitation of Prof. Dr. Charles Sprenger. As of September 2023, he started working as a researcher in the Department of Labor, Dynamics, and Mobility Statistics at CBS.


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