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Leiden  
The Netherlands

## Decisions under financial scarcity

Hilbert, L.P.

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# **Chapter 1**

## **General introduction**

### **Decisions under Financial Scarcity**

659 million people (8.5% of the world population) live in extreme poverty, meaning that they have less than \$2.15 to spend per day (The World Bank, 2023). Even in the richest countries of the world, many lack financial resources. In the Netherlands, 9% of households have strong difficulties to get by, 16% do not have enough money to go on a one-week vacation once per year, and 18% have no financial buffer to pay for unexpected expenses (Centraal Bureau voor de Statistiek, 2023). Poverty and, more generally, financial deprivation can have a myriad of negative consequences: For example, it negatively affects mental and physical health (Drentea & Lavrakas, 2000; Ridley et al., 2020; Sweet et al., 2013; Wagstaff, 2002), child development and education outcomes (Duncan et al., 2017), as well as social relations and political participation (Mood & Jonsson, 2016). Moreover, the effects of financial deprivation can reinforce financial problems, a phenomenon known as poverty traps (Azariadis & Stachurski, 2005; Bowles et al., 2016). Such poverty traps traditionally describe macro-economic and societal conditions that perpetuate poverty on the individual and societal level. More recently, research has started to investigate psychological poverty traps, describing the psychological effects of living with financial deprivation, and how these might perpetuate financial problems (Dalton et al., 2016; Haushofer, 2019; Ridley et al., 2020).

The most influential theory describing how financial deprivation affects the mind is financial scarcity theory (Mullainathan & Shafir, 2013). Prior research mainly examined psychological factors that might predict why some people end up with financial problems and others do not (Shah et al., 2012). Financial scarcity theory shifted this focus around, examining how the psychological reality of living in financial hardship affects psychological processes and thereby might perpetuate financial problems (Mullainathan & Shafir, 2013).

Financial scarcity is defined as the subjective experience of lacking resources to meet demands (Shah et al., 2012). Thus, financial scarcity refers to a psychological mindset in response to financial deprivation. This mindset is known to alter cognitive and affective processes. While this scarcity mindset is correlated with objective indicators of financial deprivation like (low) income and debts, they are conceptually distinct (De Bruijn & Antonides, 2022; Mullainathan & Shafir, 2013; Sommet & Spini, 2022; Van Dijk et al., 2022). Some people with fewer financial resources available might feel they get by just fine, while others with more resources available might feel that they have trouble to make ends meet. In line with the conceptualization of psychological stress (Lazarus & Folkman, 1984), the key determinant of a scarcity mindset is therefore the subjective perception that external demands are larger than available resources to deal with these demands. Importantly, subjective measures of financial scarcity seem to be more predictive of relevant outcomes than objective measures of financial deprivation (Sommet & Spini, 2022; Van Dijk et al., 2022). Experiencing financial scarcity is stressful (Haushofer & Fehr, 2014), causes anxiety and depression (Ridley et al., 2020; Sommet & Spini, 2022), impairs cognitive abilities (Mani et al., 2013a; Huijsmans et al., 2019), induces negative emotions (De Bruijn & Antonides, 2020), and affects decision-making (Elbaek et al., 2021; Haushofer & Fehr, 2014;

Shah et al., 2012, 2015, 2018). In this introductory chapter, I give a concise overview of financial scarcity theory and describe how the empirical chapters in this thesis contribute to the growing literature on financial scarcity.

### **Financial Scarcity Theory**

Prior research has identified two pathways through which financial scarcity affects decisions and behavior (for a recent review, see De Bruijn & Antonides, 2022): First, a scarcity mindset directs attention. Early theorizing labelled this attentional shift as “tunnel vision” (Shah et al., 2012). People focus their attention on the financial problems at hand, while neglecting other matters. For example, a scarcity mindset might direct the attentional focus to the present, while neglecting the future. As such, financial scarcity can lead to overborrowing, whereby people borrow too much at too high interest (Cook & Sadeghein, 2018; Shah et al., 2012). Likewise, a scarcity mindset might direct attentional focus towards certain types of information, while neglecting others. Prior research showed that when choosing dishes from a menu, a scarcity mindset led to a stronger attentional focus on meal prices, while health information was disregarded (Tomm & Zhao, 2016). Describing the shift in attentional focus as a “tunnel” highlights the potential negative consequences of a narrow attentional focus if things outside it are neglected. However, more recent theorizing and evolutionary research have shown that focused attention on the problem at hand might frequently also be an adaptive response to a harsh environment (Fenneman & Frankenhuys, 2020; Frankenhuys & Nettle, 2019). As such, when resources are scarce, focusing on the present might increase the likelihood of survival (i.e., be beneficial). Moreover, making financial decisions with increased attentional focus can lead to a better alignment of decisions with rational economic predictions (Duflo, 2006; Shah et al., 2018). For example, research showed that financial scarcity can reduce bias from irrelevant framing cues by increasing trade-off thinking (Shah et al., 2015) and a stronger focus on utility maximization (Fehr et al., 2022). Taken together, a scarcity mindset directs attention towards the scarce resources. This attentional focus can be an adaptive response in an attempt to solve the problem at hand, but it might also have negative consequences if important matters are neglected.

The second pathway through which financial scarcity affects decisions and behavior is the impairment of cognitive function (Mani et al., 2013a). Tasks that are mundane to the affluent become burdensome to those with scarce resources (Shah et al., 2018). For example, when doing groceries with a limited budget, prices need to be compared and trade-offs between the most necessary goods have to be made. When there is no money left, a decision has to be made between going into overdraft, pawning the family heirloom, or stopping to pay rent, electricity bills, or health insurance. Besides these inherently financial decisions, all aspects of life are seen through the lens of their expenses. Whether the kids can join a sports club or whether you can visit the dentist become financial decisions, where benefits need to be weighed against costs. Such a heightened focus on the financial dimension of every aspect of life is stressful (Haushofer & Fehr, 2014; Mani et al., 2013a) and consumes cognitive capacities, which in turn are less available for other tasks. Early research titled this mechanism a “mental

bandwidth tax”, showing that a scarcity mindset reduces performance on working memory and fluid intelligence tasks (Mani et al., 2013a). The interpretation of these findings has since been debated (for comments, see Dang et al., 2015; Wicherts & Scholten, 2013, for a response, see Mani et al., 2013b) and later studies found no or inconsistent support for a negative effect of financial scarcity on cognitive performance (Carvalho et al., 2016; Dalton et al., 2020; Fehr et al., 2022). Other work showed that an experimentally induced scarcity mindset changed neural processes, with increased activation in brain regions associated with valuation processes and decreased activation in brain regions associated with goal-directed planning (Huijsmans et al., 2019). Taken together, as a second pathway, a scarcity mindset might induce cognitive load and thereby negatively affects decisions and behavior, although the current evidence is mixed (De Bruijn & Antonides, 2022).

## **Research Questions and Thesis Outline**

Approximately a decade has passed since the inception of financial scarcity theory. Over the years, it has made valuable contributions to the understanding of the psychological reality of dealing with financial problems. Yet, several questions remain, some of which this thesis contributes to answering. In doing so, we employed a variety of methods, including experimental research with behavioral and physiological measures, as well as longitudinal and cross-societal panel studies. The chapters were written as empirical journal articles, so there is some overlap between them. All studies in this thesis were pre-registered, with openly available data, analyses codes, and materials (see Chapters 2–5).

## ***Chapter 2: Financial Scarcity Increases Discounting of Gains and Losses: Experimental Evidence from a Household Task***

Chapter 2 addresses the question in which situations a scarcity mindset increases temporal discounting, and whether discounting differs for the gain and loss domain. Temporal discounting is the tendency to devalue outcomes that are realized in the future (for an overview, see Frederick et al., 2002). Given that financial scarcity shifts the attentional focus towards the financial problem at hand (Shah et al., 2012), a scarcity mindset might direct attention towards gains and losses that are realized sooner rather than later (i.e., increase discounting). For example, a scarcity mindset might lead to a stronger preference for receiving a smaller amount of money at present, over receiving a larger amount of money in the future (i.e., discounting of gains). Likewise, a scarcity mindset might lead to a stronger preference to pay a larger amount in the future, over paying a smaller amount at present (i.e., discounting of losses). Moreover when financial resources are scarce, paying money might be extra stressful. This suggests that financial scarcity might increase discounting particularly in the loss domain. Last, financial scarcity also leads to more trade-off thinking and better aligns decisions with rational economic predictions (Fehr et al., 2022; Shah et al., 2015). This might counteract the potential effects of a scarcity mindset on increased discounting in cases where it would not be rational to discount. Therefore, it is also important to discern the effect of a subjective scarcity mindset from an objective

constraint of available monetary resources. If a scarcity mindset increases discounting, a follow-up question arises whether this is also the case when people are not constrained in available financial resources.

To examine these questions, we developed a new experimental paradigm that we coined Household Task. In this paradigm, participants managed the finances of a household by earning income and paying expenses. We varied the ratio between income and expenses between conditions, such that participants accumulated debts or savings during the task (Studies 1 & 2) and gained or lost money while available resources were controlled for (Studies 3–5). We measured participants' discount rates with a task where they had to decide between receiving smaller amounts of money sooner and larger amounts of money later (i.e., discounting gains; Studies 1–5) and where they had to decide between paying smaller amounts sooner and larger amounts later (i.e., discounting losses; Study 2).

### ***Chapter 3: The Prospective Associations between Financial Scarcity and Financial Avoidance***

Chapter 3 addresses the question whether financial scarcity is associated with financial avoidance, which is the tendency to avoid dealing with one's finances (see also Tinghög et al., 2023). Financial avoidance can manifest in various ways, such as the avoidance of learning new information, making decisions, or taking action (Anderson, 2003, 2006; Gigerenzer & Garcia-Retamero, 2017; Goleman et al., 2017; Hertwig & Engel, 2016; Steel, 2007; Sweeny et al., 2010). Whether and how financial scarcity might be associated with financial avoidance is not a straightforward question. The attentional shift towards financial problems might indicate that a scarcity mindset reduces financial avoidance, as the financial problem becomes the center of the attentional focus. At the same time, it is possible that some important financial matters fall outside the attentional focus and are neglected or avoided. For example, if someone with a scarcity mindset receives a bill, it is possible that this person dedicates their full attention towards it in an attempt to solve the problem it poses. At the same time, it is also possible that this person focuses on their already existing financial problems and therefore puts "yet another bill" in a drawer to be dealt with later. Moreover, a scarcity mindset is characterized by the perception that available resources are insufficient to effectively deal with demands (Shah et al., 2012). As such, experiencing financial scarcity might entail a perceived lack of control over one's finances (Van Dijk et al., 2022; see also Chapter 5). If people feel that their finances are beyond their control and they will not be able to effectively deal with incoming bills anyways, they might as well ignore it. Over time, a financial scarcity mindset might therefore be associated with an increase in financial avoidance. In turn, financial avoidance might also be associated with an increase in financial scarcity over time. If someone continuously avoids dealing with their finances, their perception that they have the needed resources available to meet demands might decrease. Therefore, we tested whether financial scarcity is temporally associated with an increase in financial avoidance, and vice versa.

To do so, we conducted a longitudinal panel study with a large representative sample of the Dutch population. We collected data at two time points spanning a period of 22 months. To measure financial scarcity, we used the Psychological Inventory of Financial Scarcity (PIFS; Van Dijk et al., 2022).

To measure financial avoidance, we developed a new scale measuring financial avoidance via the tendency to avoid making financial decisions and to learn financial information. We analyzed the data such that we could test whether financial scarcity at t1 is associated with an increase in financial avoidance at t2 and vice versa, while controlling for autoregressive effects.

#### ***Chapter 4: Financial Scarcity and Financial Avoidance: An Eye-Tracking Experiment***

Chapter 4 builds on Chapter 3, as it addresses the question whether financial scarcity also has a causal effect on financial avoidance. While the findings from our longitudinal study show temporally dynamic associations that might be indicative of a causal mechanism, the data are correlative and do not provide strict support for a causal mechanism.

Therefore, we conducted an experiment in which we manipulated financial scarcity with the Household Task (see Chapter 2) and measured avoidance with physiological and behavioral measures. Over multiple rounds, participants either accumulated debts or savings. At the end of each round, we presented them with two letters: One letter was an additional expense that had to be paid and the other letter was a control stimulus. During stimulus presentation, we measured participants' gaze patterns with an eye-tracker. The benefit of eye-tracking is that it allows to assess unobtrusively where people focus their attention on, live while they engage with a task (Holmqvist et al., 2011). We used two gaze measures to test whether participants with debts in the Household Task attentionally disengaged from their finances. First, we measured the time it took for participants to first fixate on a specific part of the expense letter, namely the amount that had to be paid. Second, we measured the overall duration that people fixated on the whole expense letter. Both measures had previously been used to show top-down processes of disengagement from aversive stimuli (Borozan et al., 2022; Pflugshaupt et al., 2005). As a behavioral measure of financial avoidance, we gave participants the option to delay paying the expense until the end of the experiment.

#### ***Chapter 5: Financial Scarcity and Perceived Control across Societies***

Chapter 5 addresses the question whether financial scarcity is negatively associated with perceived control over one's life, and whether this association is ubiquitous or varies across the globe. Recent empirical and theoretical work (Sommet & Spini, 2022; To et al., 2023; Van Dijk et al., 2022) as well as Chapters 2–4 in this thesis point towards the crucial role of perceived control for decision-making under scarcity. Control is defined as the perceived ability to achieve desired outcomes and reach goals (Landau et al., 2015). An important antecedent of perceived control is the perception that one possesses the needed resources and abilities to reach one's goals. As such, experiencing that financial resources are scarce might also lead to a perceived inability to reach goals, and thus a reduced sense of control. If that is indeed the case, the question arises whether the association between financial scarcity is ubiquitous or differs across societies. That is, while lacking needed financial resources might be a threat to perceived control, ample research shows that other sources of control can compensate for such a threat (for an overview, see Landau et al., 2015). For example, if someone feels that they have too little



financial resources available, a strong social network or societal institutions might reduce the impact of one's personal finances on the perception that life is out of control. Importantly, the tightness of social networks (e.g., Hofstede et al., 2011) and the quality of institutions (e.g., The World Bank, 2022) varies considerably across the globe. This suggested that there might be structural differences in the association between financial scarcity and (lack of) control across societies.

To study these questions, we conducted a survey study in 51 societies, with approximately 250 participants per society. We measured financial scarcity with a short version of the Psychological Inventory of Financial Scarcity (PIFS; Van Dijk et al., 2022) and perceived control with a single-item measure used in previous research (Hornsey et al., 2019). Next, we selected and aggregated from openly available datasets a large number of cross-societal indicators for welfare provisions, quality of institutions, and labor conditions, as well as economic development and cultural difference indices. We merged these societal level indicators with the data from our survey study and tested whether these might explain differences in the association between financial scarcity and control.

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