Universiteit Leiden
The Netherlands

Financial stress by design: examining barriers to social welfare take-up

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Citation
Simonse, O. (2024, September 11). *Financial stress by design: examining barriers to social welfare take-up*. Retrieved from https://hdl.handle.net/1887/4083181

Version:	Publisher's Version
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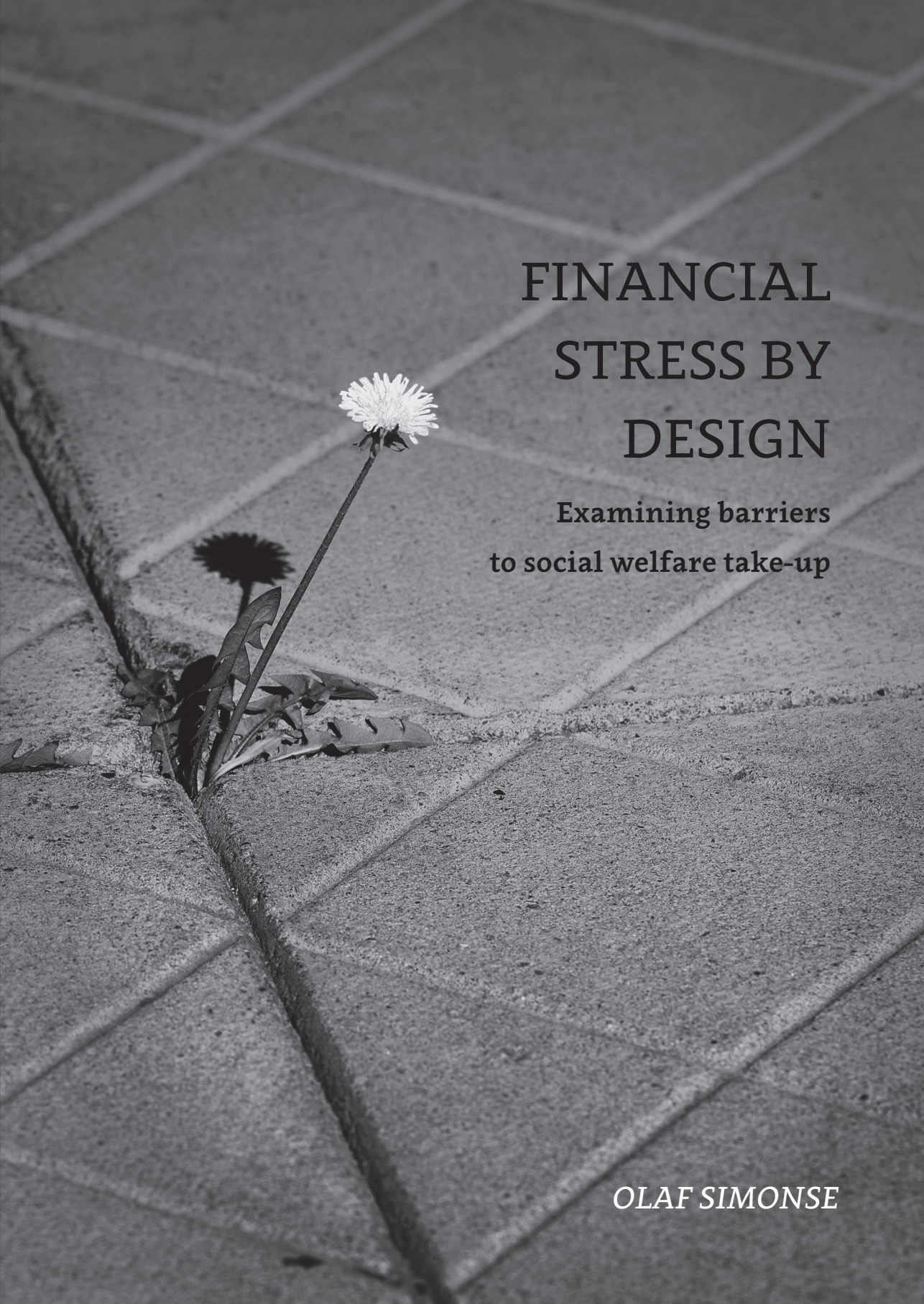
Downloaded from:	https://hdl.handle.net/1887/4083181

Note: To cite this publication please use the final published version (if applicable).



FINANCIAL STRESS BY DESIGN

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OLAF SIMONSE

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ISBN: 978-94-6483-872-5

Cover design and layout: *@ evelienjagtman.com*
Print: Ridderprint | *www.ridderprint.nl*

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FINANCIAL STRESS BY DESIGN

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Proefschrift

ter verkrijging van
de graad van doctor aan de Universiteit Leiden,
op gezag van rector magnificus prof.dr.ir. H. Bijl,
volgens besluit van het college voor promoties
te verdedigen op woensdag 11 september 2024
klokke 10:00 uur

door

Olaf Simonse
geboren te Ede
in 1970

Promotores
Prof.dr. Wilco W. van Dijk
Prof.dr. Eric van Dijk

Copromotor
Dr. Lotte F. van Dillen

Promotiecommissie
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Prof.dr. Marike G. Knoef (Tilburg University)
Dr. Anna L. Custers (Amsterdam University of Applied Sciences)
Dr. Mark Dechesne

Financiële ondersteuning
De studie uit hoofdstuk 5 werd mede mogelijk gemaakt door een bijdrage van Wijzer in geldzaken. De studie uit hoofdstuk 6 werd mede mogelijk gemaakt door een bijdrage van Centerdata.

"You will never understand how it feels to live your life
with no meaning or control and with nowhere else to go"

Pulp (1995). Common People.

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Chapter 1

Introduction

INTRODUCTION

Financial scarcity, having less money than needed, prevents people from fulfilling basic needs[1–4], which can have far-reaching consequences for their well-being and health. Beyond its financial impact, financial scarcity may impact people psychologically, evoking financial stress and adversely influencing their cognitions, emotions, and behavior[5–7]. These psychological consequences depend not only on the financial situation per se but are also elicited by the subjective perception of the situation. Financial stress is a form of psychological stress that encompasses an appraisal of insufficient financial resources, a perceived lack of control over one's financial situation, financial rumination and worry, and a short-term focus[8]. A growing body of literature has identified a link between financial stress and mental and physical health issues[9–11].

Social welfare aims to support those who cannot (temporarily) sustain themselves financially, mitigating the negative consequences of financial scarcity and preventing or reducing financial stress. Social welfare systems redistribute income to alleviate and prevent poverty, reduce income shocks, guarantee a basic standard of living, and facilitate access to housing, healthcare, and education[12]. Many households, however, do not take up social welfare for which they are eligible. As a result, social welfare does not fully succeed in providing financial security for vulnerable households and countering financial stress. Not participating in welfare may decrease individual households' well-being and perpetuate poverty and financial stress[13].

This dissertation aims to contribute to the literature on financial stress and non-take-up of social welfare. This introduction gives an overview of the research on financial stress and non-take-up. I identify gaps in the literature and describe how the studies in this dissertation contribute to reducing those gaps.

The first part of the dissertation focuses on financial stress. I first examine how changes in financial stress coincide with changes in mental health (Chapter 2). Simultaneously, I examine economic factors associated with these shifts in financial stress. Next, I investigate the intricate relationship between five aspects of households' economic situation – income, savings, debts, income volatility, and employment – and financial stress (Chapter 3).

The second part of the dissertation extends the literature on the non-take-up of social welfare. First, I systematically review the literature and develop a new conceptual framework for non-take-up (Chapter 4). Next, I describe the lived experiences of low-

income households with participation in social welfare programs (Chapter 5). I then examine how ten potential psychological barriers predict the non-take-up of social welfare (Chapter 6). Finally, I examine the causal relationship between reclaims, one of these potential barriers, and non-take-up (Chapter 7).

PART I: FINANCIAL STRESS (CHAPTERS 2 AND 3)

Financial scarcity, defined as having fewer financial resources than needed[5], is not limited to developing countries. Even in countries with more economic prosperity, many households are in poverty or problematic debts, two severe manifestations of financial scarcity. In OECD countries, the percentages of families living below the poverty line range from 5.6% in the Czech Republic to 20.3% in Costa Rica, with percentages as high as 15.1% in the United States and 11.2% in the United Kingdom (OECD average 11.5%)[14,a]. In the Netherlands, where most of the studies in this dissertation were conducted, the poverty rate is 8.3%. In the EU, 14.1% of the households are overindebted, and 21% risk overindebtedness[15,b].

Financial scarcity can hinder one from obtaining basic needs, such as food, shelter, and healthcare, providing for family and spouse, achieving social status and security, pursuing goals and dreams, and attaining personal fulfillment. Moreover, insufficient financial resources can lead to financial stress, which, in turn, can negatively affect mental and physical well-being. To capture the subjective experience of financial stress, Van Dijk et al.[8] developed the Psychological Inventory of Financial Scarcity (PIFS), a self-rating scale of subjective perceptions of one's financial situation and affective and cognitive responses to these appraisals. The PIFS combines psychological stress and financial scarcity into one measure of financial stress. The scale comprises four components: an appraisal of insufficient financial resources, a perceived lack of control over one's finances, financial worry and rumination, and a short-term focus. This operationalization is consistent with the idea that people experience stress when they evaluate situational demands as outweighing their resources[16,17], and with models of general stress, in which stress is understood as an adaptive (physiological) response to a real or perceived threat[18–20]. This threat can lead to mental health problems, such as anxiety and depression[19].

Stress narrows an individual's momentary thought-action repertoire toward specific actions to deal with the threat[21]. Like general stress, financial stress can

a OECD defines the poverty rate as the ratio of the number of people (in a given age group) whose income falls below the poverty line, taken as half the median household income of the total population.

b According to the EU definition, households are overindebted when they "reported not being able to make scheduled payments related to rent or mortgages, consumer credit, loans from family or friends, or utility or telephone bills". Households are at risk of being overindebted when they have difficulty making ends meet.

be seen as an adaptive reaction to harmful or threatening situations. Focusing on the short term, for example, is reasonable and necessary when one lacks financial resources to meet basic needs (e.g., food or shelter). This reasoning of financial stress as an adaptive response to dire financial circumstances is corroborated by research showing that people lacking financial resources perform better on selective attention, vigilance, detecting imminent dangers and opportunities, tracking conditions that change rapidly, persisting when procuring an immediate reward, and valuing money[22,23].

Although financial stress can be regarded as an adaptive response to financial scarcity, it is often accompanied by negative socio-emotional states: it relates positively to loneliness and social exclusion and negatively to self-worth[8,24]. Financial stress may also go together with impeded cognitive functioning[6]. It is negatively related to attention, self-control, self-monitoring, planning, and taking initiative[8]. Rumination is associated with impaired problem-solving, reduced task performance, and negative affect[25]. People who experience financial stress also show behaviors that may exacerbate economic hardship, such as avoiding financial information and decision-making, impulse buying, gambling, overspending, suboptimal investing, decreased job search effectiveness, and overborrowing[5,26–30]. These findings suggest that financial stress may result in cognitions, emotions, and behavior exacerbating financial hardship. There is, in other words, a risk of *financial stress traps*.

In addition, prolonged financial stress negatively relates to overall well-being and more chronic mental health problems such as anxiety and depression[9–11,31–33]. The literature on the association between financial stress and well-being is primarily cross-sectional; there is little insight into the dynamic relationship between financial stress and well-being. Our first study, described in Chapter 2, examines the association between changes in financial stress and mental health in a broad sample of the Dutch population during the COVID-19 pandemic. This study also examines the dynamic relationship between several economic factors, namely income, savings, and debts on the one hand and financial stress on the other.

Next, I delve deeper into the intricate relationship between households' economic circumstances and financial stress. While it is well-established that low income is often associated with financial stress[34,35], it is essential to recognize that focusing solely on income as a predictor of financial stress is too simplistic. Low-income households often struggle with managing expenses while providing for their families, leading to rumination, heightened immediate concerns, and reduced

control. However, low income is unlikely to be the sole predictor of financial stress. Research on mental health and studies from economics has revealed various factors predicting well-being and stress. Income is just one piece of the puzzle; economic factors such as savings, debts, income volatility, and employment may also play a role. Studies have revealed that savings[36,37] and employment[38,39] relate positively to well-being, while debts[40–42] and income volatility[43,44] relate negatively to well-being.

While most studies have traditionally focused on one or two isolated aspects of one's economic situation when explaining or predicting financial stress, the study described in Chapter 3 takes a more integrative perspective. I examine how five facets of one's economic situation - namely, income, debts, savings, income volatility, and employment - relate to financial stress. This cross-sectional study, conducted among Dutch households, sheds light on the relative contributions of multiple economic factors to predicting financial stress.

PART II: NON-TAKE-UP OF SOCIAL WELFARE (CHAPTERS 4 THROUGH 7)

Part II addresses the pivotal role that social welfare plays in potentially elevating financial resilience, thus serving as a mechanism for preventing or reducing financial stress. Social welfare stabilizes individuals and societies by providing financial security to those who cannot sustain themselves financially. This role is particularly crucial in the face of heightened macroeconomic uncertainties and volatile labor markets[45]. The success of social welfare systems in accomplishing their goals hinges on how easily those in need of assistance can access them[46]. Policymakers grapple with a dilemma in this respect. While they establish eligibility criteria to guarantee that social welfare benefits are directed toward the households that most need them, these criteria can create hurdles that might discourage eligible households from taking up social welfare[47,48].

Although levels of non-take-up are not systematically measured, non-take-up is a serious issue worldwide. Hernanz et al. compiled data available in OECD countries between 1974 and 2001[49]. They found levels of non-take-up varying between 20% and 60% for means-tested social assistance programs. Non-take-up of housing benefits spanned a broader range, with typical values of around 20%. Unemployment benefits had non-take-up rates of 20% to 40%. In recent years, non-take-up still appears to be high. A study in 2022 in the UK, for example, showed that approximately 30% of the entitled individuals did not claim Pension Credit, whereas some 20% did not claim Housing Benefits for pensioners[50]. A study in six European countries showed that non-take-up of minimum income benefits varied between 38% and 90%[51].

Understanding determinants of non-take-up can help optimize social welfare systems towards achieving financial security for vulnerable households, thus preventing or reducing financial stress. A better understanding of non-take-up can help shape the future of social welfare. Research on the non-utilization of social welfare can guide policymakers in crafting more effective and informed policies for the future.

The literature on non-take-up has a long history[52–54]. The body of knowledge on welfare participation is heterogeneous in methods and disciplines. It includes reviews and theoretical and empirical contributions from economics, psychology, sociology, and public administration[55]. In the last decade, behavioral insights have proposed new inhibiting factors affecting non-take-up in the last ten years, such as administrative burden, bad experiences with welfare participation, and the fear of reclaims[56,57].

There are, however, some gaps in the non-take-up literature. First, the vast amount of literature added in the last ten years has not been reviewed systematically. The very influential model developed by Van Oorschot in the 1990's[48] still guides many of the studies on non-take-up. Both research and policy could benefit from an updated framework. Therefore, I systematically reviewed the literature on the determinants of welfare participation. I developed a new theoretical framework to guide future research, policy, and practice. Chapter 4 describes the literature review results and the resulting theoretical framework.

A second gap in the literature on the non-take-up of social welfare is that it predominantly comprises quantitative empirical studies. Few studies have qualitatively examined how financially vulnerable households experience welfare participation. Focusing exclusively on quantitative research neglects the more nuanced, subjective aspects of non-take-up in social welfare. Qualitative studies are crucial for uncovering the lived experiences and contextual factors that shape financially vulnerable households' interactions with welfare programs, offering a more comprehensive understanding. Understanding these experiences and factors may help develop more inclusive social welfare systems that better meet the needs of these households. To address this gap, I conducted a qualitative interview study among low-income households in two major cities in the Netherlands about their experiences with participating in welfare. Chapter 5 describes the results of this study.

Third, empirical evidence on non-take-up is fragmented. In the last two decades, studies from different fields have benefited from behavioral insights in examining factors that inhibit eligible households from taking up social welfare. Existing studies, however, typically included only a limited number of potential inhibitors and promotors of welfare participation. Therefore, these studies do not reveal the relative contributions of different factors in explaining non-take-up within one integrative framework. Also, in the absence of such an integrative approach, an observed relationship in these studies between non-take-up and isolated factors may partly reflect a relation with unmeasured factors. I address these issues by combining theoretical and empirical findings from economics, public administration, and psychology into one model. In this study, described in Chapter 6, I examine the combined influence of various psychological factors on the non-take-up of healthcare and child support benefits in the Netherlands, revealing the relative strengths of these different factors in explaining non-take-up.

Finally, research attention has not been evenly distributed between the various potential determinants of non-take-up. Some potential determinants of non-take-up, such as information provision[58–62], complexity[56,63–66], administrative burden[67–69], and stigma[70–73], have been extensively studied, whereas empirical evidence on other factors, such as administrative capacity[74], proximity to welfare[75–77], negative experiences with welfare[56] and fear of reclaims[78,79], is scarce. Reclaims, in particular, have become increasingly relevant in recent years. Due to changing employer-employee relations and other macroeconomic trends, many citizens have (highly) variable incomes. Policymakers have attempted to develop welfare policies that ensure better and quicker alignment with households' dynamic financial situations. Millar and Whiteford[80] observed that the challenge associated with increased responsiveness is "the risk that payments get out of step with circumstances resulting in underpayments or overpayments, and hence debts to be repaid"[80] (p. 5). They argued that increased income volatility may have resulted in a greater prevalence of reclaims. Little is known about how reclaims of social welfare affect subsequent non-take-up. My final study, described in Chapter 7, aims to experimentally study the effect of reclaims on the non-take-up of social welfare.

OUTLINE OF THIS DISSERTATION

This dissertation aims to contribute to a better understanding of the dynamic relationship between financial stress and mental well-being, the predictors of financial stress, and the determinants of the non-take-up of social welfare as a policy tool for providing financial security and decreasing financial stress.

For these purposes, I used a mixed-method approach. I employed quantitative methods to analyze both longitudinal data (Chapter 2) and cross-sectional data (Chapters 3 and 6), conducted a systematic literature review (Chapter 4) and qualitative interviews (Chapter 5), and performed two experimental studies (Chapter 7). The rest of this dissertation is structured as follows.

Chapter 2 presents a study that used longitudinal data gathered before and during the first six months of the COVID-19 pandemic in a probability sample of Dutch households. It examined the association of financial stress with mental health changes and households' economic situation before and during the pandemic.

Chapter 3 encompasses a cross-sectional study that examines how five aspects of one's economic situation - income, debts, savings, income volatility, and employment - independently and in conjunction predict financial stress. Also, it examined whether income moderated the association between the other four aspects and financial stress.

Chapter 4 describes a systematic literature review on the determinants of non-take-up. Using the PRISMA extension for scoping reviews[81], I reviewed the literature on non-take-up between 2012 and 2023. Based on the outcome of our analyses, I developed a new theoretical framework that can guide future research, policy, and practice.

Chapter 5 reports a qualitative study among low-income households interviewed in two major cities in the Netherlands - The Hague and Eindhoven - about their experiences with low income and welfare participation.

Chapter 6 unveils a cross-sectional study among Dutch households eligible for health care and child support benefits. I used a survey to examine how ten potential psychological barriers (executive functions, knowledge, self-efficacy, financial stress, administrative burden, social support, perceived eligibility, perceived need, fear of reclaims, and welfare stigma) predicted non-take-up. I identified the relative contributions of these factors to explaining non-take-up.

Chapter 7 describes two experimental studies. Using an experimental household paradigm, I examined if reclaims negatively affected subsequent take-up of income support in a sample of respondents from the UK.

Chapter 8 summarizes the main findings of the studies comprising this dissertation, suggests directions for further research, positions our findings in the context of trends in social welfare, and provides advice to policymakers that can help design more effective social welfare systems.

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Part I

Financial stress

Chapter 2

The role of financial stress in mental health changes during COVID-19

Based on:
Simonse, O., Van Dijk, W. W., Van Dillen, L. F. & Van Dijk, E. The role of financial stress in mental health changes during COVID-19. *npj Mental Health Research* **1**, 15 (2022). *https://doi.org/10.1038/s44184-022-00016-5*

ABSTRACT

Using longitudinal data before and during the first six months of the COVID-19 pandemic for a representative sample of Dutch households, we examined the role of financial stress, defined as the subjective experience of lacking financial resources to cope with demands, in mental health changes. Also, we examined financial stress and mental health relations with households' income, savings, and debts. The data revealed that average mental health did not change during the first six months of the pandemic but showed considerable underlying heterogeneity. Results showed that financial stress changes significantly explained this heterogeneity. Increases in financial stress predicted decreases in mental health, whereas decreases in financial stress predicted increases in mental health. While income did not explain financial stress changes, fewer savings and more debts were related to increased financial stress, which was, in turn, negatively related to mental health. We discuss the implications of our findings for mental health care and financial security policy and provide suggestions for future research.

INTRODUCTION

On 11 March 2020, the World Health Organization (WHO) declared COVID-19 a pandemic[1]. Health authorities quickly realized that the pandemic posed a physical and mental health threat. On 18 March 2020, the WHO wrote, "This time of crisis is generating stress throughout the population"[3] (p. 1) and called upon policymakers, health care professionals, and the general population to "support mental and psychosocial wellbeing in different target groups during the outbreak."[3] (p. 1). Based on experience with previous pandemics, such as the Spanish flu (1918-1920), the Asiatic flu (1956-1957), the Severe Acute Respiratory Syndrome (SARS, 2002-2003), the "Swine" flu (2009), and Ebola (2013-2014), researchers proposed that the mental health consequences of the COVID-19 crisis were likely to be present for a long time and peak later than the actual pandemic[2–4]. They called upon the research community to study the mental health effects of COVID-19.

Studies of mental health development during the pandemic have found mixed results. Some studies observed negative mental health outcomes[5–10], whereas others reported positive aspects of the pandemic[11,12] or found no evidence of changes in mental health outcomes during the pandemic[11,13,14]. Robinson et al. observed a high degree of unexplained heterogeneity in mental health responses to COVID-19[8]. The most reported symptoms have been post-traumatic stress[5–7], depression[6–8,10], and anxiety[5,10,12,15–17]. Other reported symptoms include insomnia[5,18] and loneliness[19].

Scholars have proposed three potential pathways by which the pandemic may affect mental health: the disease itself, the quarantine measures, and the economic consequences of the pandemic. As for the first pathway, the disease (threat) may directly affect mental health. People may fear that they or their significant others may be infected[4,15]. Those who catch the disease may suffer post-infection consequences, such as fatigue and pain[20] and fear of being a burden to those around them[4]. The second pathway acknowledges that measures to contain the disease, such as quarantine and social distancing, may affect mental health by reducing opportunities for physical and mental health activities, such as recreational activities and routines[15,21–23]. The third pathway assumes that mental health may suffer from the economic consequences of the pandemic[15,22]. In the current study, we focus on this economic pathway, particularly the potential role of financial stress in explaining changes in mental health.

Research suggests that, as a consequence of these three pathways, socioeconomically disadvantaged groups are more vulnerable to mental health problems during the pandemic[11,12,19–21,24–27]. First, low socioeconomic status is associated with a higher chance of COVID-19 infection, resulting in higher mental distress[28,29]. Second, low-income jobs are less likely to be executed from home, so they are most affected by the lockdown and social distancing measures[30]. This may also increase role conflicts, combining work and family obligations[30,31]. Third, socioeconomically disadvantaged and financially vulnerable groups are more likely to suffer the pandemic's economic consequences. They are likelier to work in sectors that suffered the most from COVID-19, such as restaurants, travel, entertainment, and certain retail branches. Also, workers most likely affected by unemployment are less educated and have fewer financial resources. An empirical study among people across the European Union in the first six months of the pandemic showed high job insecurity among those with temporary contracts. Also, the unemployed had difficulty making ends meet, and people with low job insecurity had considerable mental health issues[32]. A cross-sectional study among 1,441 US citizens in the first two months of the pandemic showed that financial stressors and low assets were associated with higher odds of depression[33]. Financial stressors were defined as losing a job, a household member losing a job, having financial problems, and having difficulty paying rent. Assets included social assets (education and marital status), physical assets (homeownership), and financial assets (household income and household savings). Despite considerable support for a negative relationship between socioeconomic status and mental health outcomes, some studies do not find such a relationship[5,34,35]. For example, Pijpker et al. found no differences in mental health between low and high socioeconomic status respondents in a sample of the Dutch population[36].

Entrepreneurs, particularly self-employed, are another group that suffered from the economic consequences of the pandemic. They experienced a higher loss of working hours than others during the pandemic[37,38]. Several studies indicate that self-employed people are susceptible to mental health problems due to the pandemic's economic consequences of the pandemic[26,39,40]. This finding should be treated with caution; a recent systematic review of studies comparing mental disorders in the self-employed versus employees found evidence of a link between self-employment and increased risk of mental illness[41].

Research on the relationship between the economic situation of households and mental and physical health has a long history. In the 1980s, Rose and Marmot followed more than 17,000 municipal officials in London. Their well-known

Whitehall Studies showed that lower-paid civil servants were more likely to develop cardiovascular disease than their colleagues with higher positions[42]. Since then, studies have shown the relationship between poverty and many physical and mental conditions, such as diabetes, cancer, chronic lung disease, schizophrenia, depression, substance use, and anxiety disorders[43–45].

When in financially challenging circumstances, such as low income or debt, people can experience financial stress[46]. Financial stress is a psychological concept characterized by the subjective experience of lacking financial resources to cope with demands[47]. The current study conceptualizes financial stress as combining two stress appraisals (money shortage and lack of control) and two stress responses (worrying about money and short-term focus)[48,49].

There is evidence that financial stress mediates the relationship between poverty and health[50]. Poor households often have fewer resources (for example, financial buffers in savings and social support) to deal with life events. This lack of resources may result in stress and health problems[51,52]. Debt is also associated with stress and mental health problems[53]. Income fluctuations cause uncertainty and, therefore, stress[54,55]. Having savings to deal with setbacks reduces stress and increases financial well-being[56].

Although the evidence is mixed, most studies have found that mental health declined during the COVID-19 pandemic. Research also indicated a high degree of unexplained heterogeneity in mental health changes. Many studies on COVID-19 and mental health cannot adequately examine these changes because these studies have cross-sectional designs. When studies used longitudinal designs, data collection (understandably) started only after the pandemic outbreak. The current study examined mental health changes by including data collected before and after the pandemic outbreak; this was possible by connecting long-running data on mental health to ongoing data collection on financial stress[49]. The current study specifically focused on how (changes in) financial stress might explain these mental health changes.

Moreover, we examined how households' financial situation before COVID-19 and income development during COVID-19 explained financial stress. Having savings may protect against financial stress because savings can absorb income loss or unexpected expenditures. Especially in economically uncertain times, lacking sufficient savings may result in feelings of not being in control of one's financial situation and worries about being unable to meet financial obligations.

Thus, low levels of savings may result in increased financial stress. Similarly, having debts in economically uncertain times may trigger worries about being unable to repay them because of the anticipation of future income drops. Also, having debts may increase feelings of dependency on others[57]. Thus, having debts in economically uncertain times such as COVID-19 may increase financial stress. Also, it stands to reason that income and financial stress are dynamically related: Income drops are likely associated with increasing financial stress, given that a large portion of households' expenditures (e.g., rent, insurance, and utilities) is fixed. Finally, households' income level is likely to be negatively associated with financial stress. Low-income households are more vulnerable to becoming unemployed. Moreover, low-income households may have fewer opportunities to cut spending. We tested three hypotheses:

Hypothesis 1. Increases in financial stress during COVID-19 positively relate to decreased mental health, whereas decreases in financial stress correlate to increased mental health.

Hypothesis 2. Falling incomes during COVID-19 and low incomes, low savings, and high debts before COVID-19 relate to increases in financial stress during COVID-19.

Hypothesis 3. Changes in financial stress during COVID-19 mediate the association between financial vulnerability (income drops, low incomes, low savings, and high debts) and mental health changes.

METHODS

Data and variables

We used data from the Longitudinal Internet Studies on Social Sciences (LISS) panel (initial N = 1,114). The LISS panel consists of a representative sample of approximately 5,000 households drawn by the Central Bureau of Statistics of the Netherlands[58]. Respondents fill in monthly questions on various topics, such as health, family, work, personality, and economic situation. To ensure that vulnerable households can participate, they are supplied with laptops and an internet connection if necessary. The rich dataset enabled us to examine the relationship between household developments, economic situation, financial stress, and mental health. We used three measurements to compare the situations before and during COVID-19: April – November 2018 (t = 0), December 2019 – March 2020 (t = 1), and December 2020 – March 2021 (t = 2).

The methods were performed following relevant guidelines and regulations and approved by Centerdata. The current study used secondary data provided by Centerdata. Informed consent was obtained from all participants by Centerdata. Before participating in the LISS panel, participants must consent to Centerdata to save their responses and make them available for scientific, policy, and social research.

Mental health. The literature suggests that the most prevalent mental health problems related to COVID-19 are anxiety and mood disorders. To assess mental health, we, therefore, used the Mental Health Index (MHI-5), a brief and reliable measure of mental health with good validity for anxiety and mood disorders[59], and a subset of the validated SF-36 Health Survey[60] (Cronbach's α = .87). MHI-5 asks respondents how often they felt nervous, down, calm, depressed, and happy in recent weeks. Respondents' scores on each item ranged from 1 (*never*) to 6 (*continuously*). We recoded the items so that higher scores reflected better mental health. LISS' health questionnaire measures MHI-5 every year. We used the measurements administered in November/December 2018, 2019, and 2020.

Explanatory variables. We used the Psychological Inventory of Financial Scarcity (PIFS) (Cronbach's α = .93) to measure financial stress[48,49]. The PIFS assesses the subjective experience of financial stress and captures appraisals of insufficient financial resources and lack of control over one's financial situation, responses regarding financial rumination and worry, and a short-

term focus. Respondents' scores on each item range from 1 (*totally disagree*) to 7 (*totally agree*). Higher scores indicate more financial stress. The PIFS was administered in April 2018, February 2020, and August 2020.

We included four aspects of a household's economic situation in the analyses: income, income volatility, savings, and debts. We used monthly income data for 2018, 2019, and 2020. For savings and debts, we used the last available measurement before the outbreak of COVID-19. This measurement was held in June/July 2019 and concerned households' financial situation at the end of 2018.

Income. The LISS panel measures net monthly household income in euros. We summed the net monthly household incomes for 2018, 2019, and 2020 to obtain yearly net household incomes. Since the needs of a household grow with each additional member, we corrected for household size. To consider economies of scale, we adjusted household income by dividing it by the square root of household size, in line with OECD guidance[61]. We included income at the first measurement and income changes between the three measurements as independent variables in our model.

Savings. Savings may serve as buffers against unexpected expenditures and income shocks. Ruberton et al. stressed the importance of liquid wealth for wellbeing[56]. We, therefore, included the amount of household liquid savings in our analyses. Respondents were asked: "What was the total balance of your banking account, savings accounts, term deposit accounts, savings bonds or savings certificates, and bank savings schemes on 31 December 2018?". If they responded, "I don't know," the questionnaire asked, "To what category did the total balance (total value) belong on 31 December 2018 (positive or negative)?" and given 15 categories (less than € 50 to € 25.000 or more). We used the category midpoints to calculate savings.

Debts. We excluded mortgages and student loans from our analyses to calculate debt amounts and focused on consumer credit. We argue that, for most households, having a mortgage contributes less to financial stress than other types of debt since a mortgage is not a sign of financial difficulties in most situations. Also, the home's value usually amply compensates for the mortgage loan's value. Student loans in the Netherlands have favorable conditions and are waivered if one has difficulties repaying them; therefore, they should also contribute less to financial stress. The survey asked

respondents to indicate whether they had (a) one or more personal loans, revolving credit arrangement(s), or financing credit(s) based on a hire-purchase or installment plan, (b) a loan or credit arrangement based on a pledge, (c) overdue payments on one or more credit cards (d) money loaned from family, friends, or acquaintances, and (e) any other credits, loans or debts. Respondents who held one or more of these debts were then asked: "What was the total amount of the loans, credits, and debts you had on 31 December 2017? This concerns the total of all the components you check-marked in the previous question." If they responded, "I don't know," the questionnaire asked, "To what category did the total balance (total value) belong on 31 December 2018 (positive or negative)?" and given 14 categories (less than € 500 to € 100,000 or more). We used the category midpoints to calculate debt amounts.

Control variables. Our analyses used age, education level, household composition, and personality traits as control variables. Age and education level may confound the association between income and financial stress. Furthermore, research has shown that mental health during COVID-19 may differ between households with different compositions[12,19,20,35]. We distinguished four household types: (1) no partner, no children, (2) children, no partner, (3) partner, no children, and (4) partner with children.

We considered the Big-Five personality traits (extraversion, agreeableness, openness, conscientiousness, and emotional stability)[62] as potential confounders of the relationship between mental health and one or more independent variables. Several studies have indicated that personality traits influence saving behavior, impulse buying, debts, and financial stress. The literature provides the most support for extraversion, conscientiousness, and emotional stability as potential covariates. For example, conscientiousness is positively associated with savings and negatively with debts[64] and financial stress. Extraversion negatively predicts debts[64]. Emotional stability shows a negative association with financial stress[48]. We, therefore, included subscales for emotional stability, conscientiousness, and extraversion (α = .77, .89, and .87, respectively) in our analyses.

We parsed out the variance between six controls (age, education level, household composition, emotional stability, conscientiousness, and extraversion) and the independent variables. This allows us to examine the unique relationship between economic variables, financial stress, and mental health.

Model

A linear mixed model analyzes the dynamic relationship between variables of interest within and across individuals. We were interested in how financial stress and mental health changes were related. Moreover, we wanted to establish indirect relations between income changes during COVID-19, income, savings, and debts before COVID-19, on the one hand, and mental health changes on the other. In addition, we wished to allow for individual heterogeneity in mental health. We, therefore, chose a random intercepts model, meaning that the average mental health and financial stress over the three observations may differ between individuals. At the same time, the slopes are homogeneous for the sample. We included time as an independent variable to test whether mental health and financial stress changed between measurements. Also, we added time as a moderator to our model to test whether the relationship between mental health and financial stress differed between the three measurements.

Furthermore, we did not impose any restrictions in advance on the covariance between observations at different measurement moments (unstructured covariances). We standardized the numeric variables to ease the interpretation of the parameter estimates. We estimated a mediation model to test our hypotheses, where mental health was the dependent variable, financial stress was the mediator, and income, savings, and debts were the independent variables. The following equations describe the model mathematically:

$$y_t = \alpha + \beta x_t + \gamma m_t + z\delta + \varepsilon d_t + \theta d_t m_t + \eta_{1t} \quad (1)$$

$$m_t = \kappa + \lambda x_t + z\mu + \nu d_t + \eta_{2t} \quad (2)$$

In these equations, t represents the time of the measurement (t = 1, 2, 3), d_t is the corresponding dummy variable, y_t is a vector with length N = 1,114 with the dependent variable mental health at measurement t for each respondent. x_t Is a vector with the time-dependent variable income at time t. z Is a matrix with constant variables over time: the independent variables (savings and debts) and control variables (age, education level, gender, household composition, and personality traits). m_t is a vector with the mediator financial stress at measurement t; $d_t m_t$ represents the interaction between the time dummy and the mediator financial stress. α and κ are vectors with random intercepts. $\beta, \gamma, \delta, \varepsilon, \theta, \lambda, \mu$, and ν are the regression coefficients and η_{1t} and η_{2t} are the prediction errors.

Analyses

Our statistical analyses were designed to deal with missing values and outliers. First, many observations had missing data on one or more variables. All variables, except age and gender, had missing values; 15% were missing, and 67% of the observations had a missing value on at least one variable. Missing values on the financial stress measurements were due to attrition; the reasons for missing values on the other variables are unknown. Second, an inspection of diagnostics from the OLS regression showed many influential observations (outliers). Our analyses addressed these data characteristics by performing multiple imputations and choosing a robust regression method for influential observations. Because the regressions tested multiple null hypotheses, we adjusted the p-values proposed by Benjamini and Yekutieli to control for false discovery rates[65,66].

Multiple imputation. Deleting observations with missing values on one or more variables would leave 67% unused, resulting in inflated standard errors[68]. If the attrition is selective, the resulting estimations may be biased. Multiple imputation reduces standard errors and bias[67,68]. We selected an iterative Monte Carlo Markov Chain (MCMC) mechanism to generate imputations and used the R package *jomo* to perform the imputations[69]. MCMC assumes multivariate normality but performs well if this assumption does not hold[70]. For the imputation, we did not consider the longitudinal structure of the data. Previous research has shown that reflecting this structure in the imputation process is not needed[71]. To increase the plausibility of missingness at random, we included the control variables age and gender as auxiliary variables in the imputation process[70]. A test run with 20 imputations, using Satterthwaite's correction for the degrees of freedom, resulted in a maximum fraction of missing information (fmi) of .64[72]. Based on Von Hippel's guidance, we set the number of imputations at 101, corresponding with a 5% variation in the standard error estimates[73]. We performed the subsequent analyses with each of the 101 imputed datasets and combined the results using Rubin's rules[74]. The parameter estimates are simply the averages over the imputations. The standard error is the square root of the within-imputation variance and the between-imputation variance.

Robust multivariate regression. It is well established that ordinary least squares (OLS) estimation can give highly unreliable outcomes in the presence of influential observations. OLS minimizes the sum of the squared residuals, which offers "unusual" observations an unduly large weight. We applied the *robustlmm* package in R to generate robust parameter estimates for our linear mixed effects model[76]. This package minimizes a smoothed version of the Huber function[76]. It uses an iterative reweighing algorithm to estimate the model parameters.

To establish whether financial stress mediated the association between respondents' economic situation and mental health, we calculated the indirect associations using the distribution-of-the-product method proposed by MacKinnon[77,78].

RESULTS

Descriptive statistics

Table 1 summarizes sample statistics. The initial sample contained 1,114 respondents. Attrition was 25% between the first and the second measurement and 12% between the second and third measurements. Inspection of the descriptives for the three measurements reveals that – on average – those who remained in the sample had somewhat higher incomes and were slightly older than those who dropped out (note that "Age" in Table 1 represents the age at the first measurement). Financial stress, on average, was low, and mental health was relatively high in all three measurements. Average financial stress was stable in the first two measurements (1.78 and 1.76, respectively) and declined somewhat in the third (1.63). Mental health remained virtually unchanged in the three measurements (4.13, 4.14, and 4.17, respectively).

Figure 1 provides a graphical presentation of mental health development during COVID-19. There are no observable shifts in average mental health between November/December 2018 and November/December 2020 (see Figure 1a). This corroborates the findings of the Dutch Social Planning Office and the Dutch Health Council[13,80]. However, we observed considerable variation in mental health changes (see Figure 1b). For large proportions of respondents, mental health increased (39%) or decreased (40%) between the first and last measurements. For 21% of the respondents, mental health did not change. In sum, while the mean level of mental health appeared stable, we observed considerable heterogeneity among respondents. A similar pattern emerged for financial stress (see Figure 2): On average, financial stress was stable, but there was considerable individual heterogeneity.

Table A1 in the Appendix provides statistics for the three groups of respondents: those with decreased, unchanged, and increased mental health. On average, those with unchanged mental health had higher adjusted incomes than those with decreased or increased mental health. Adjusted incomes increased in all three groups, but the adjusted income increase was the lowest in the group with decreased mental health. In the group with decreased mental health, median savings were lower (€ 36,667) than in the group with unchanged mental health (€ 48,364) but somewhat higher than in the group with increased mental health (€ 33,137). The median debt amount was the highest in the group with decreased mental health (€ 3,135), compared to the group with unchanged mental health (€ 458) and increased mental health (€ 1,947). Financial stress decreased in all three groups, but there was more variability in the group with decreased mental health.

Table 1. Descriptive Statistics. Median (IQR); Mean (SD) [Minimum Maximum]; N(%)

Characteristic	***t = 0: N= 1,114***
Net Income	*32,688 (21,575, 46,225)*
Age (years)	*53.0 (17.8) [18.0 92.0]*
Education Level	
1: primary school	65 (6%)
2: vmbo (intermediate secondary education)	220 (20%)
3: havo/vwo (higher secondary education)	133 (12%)
4: mbo (intermediate vocational education)	269 (24%)
5: hbo (higher vocational education)	283 (25%)
6: wo (university)	143 (13%)
Gender: Female	613 (55%)
Household Composition	
1: no partner, no children	301 (30%)
2: no partner, with children	37 (4%)
3: partner, no children	381 (38%)
4: partner, with children	293 (29%)
Savings	35,906 (72,592) [-8,000 662,957]
Debt Amount	2,216 (18,110) [0 320,000]
Financial Stress (1-7)	1.78 (1.03) [.92 6.42]
Mental Health Index (1-6)	4.14 (.85) [1.00 5.40]

The correlations between mental health at the three measurements were around .7 (Table 2). For financial stress, correlations between the three measurements were between .6 and .8 (Table 3). We can interpret these correlations as mental health and financial stress parts that are more or less constant and determined by stable intra-individual factors such as demographic variables and personality traits. Although these autocorrelations are moderate to high, they are not perfect. These imperfect correlations confirm the view that there are dynamics in the two variables, which stable factors do not explain.

Regression results

Regression results partly confirmed our three hypotheses. Changes in financial stress predicted changes in mental health; in line with hypothesis 1, increases in financial stress were positively related to decreases in mental health (β = -0.119, -$t(667)$ = 5.25, $p < .001$) (Table 4). Increases in financial stress, in turn, were predicted by low savings (β = 0.141, $t(122)$ = -3.53, p = .005) and high debt

	t = 1: N= 838	***t = 2: N= 736***
	34,100 (22,800, 47,950)	*34,380 (22,800, 48,068)*
	54.5 (16.9) [18.0 92.0]	*55.6 (16.6) [18.0 92.0]*
	46 (6%)	40 (5%)
	180 (22%)	160 (22%)
	94 (11%)	80 (11%)
	208 (25%)	183 (25%)
	213 (25%)	190 (26%)
	96 (11%)	82 (11%)
	451 (54%)	390 (53%)
	249 (30%)	218 (30%)
	34 (4%)	27 (4%)
	329 (39%)	298 (40%)
	226 (27%)	193 (26%)
	38,950 (78,269) [-950 662,957]	40,726 (81,179) [-950 662,957]
	2,207 (18,624) [0 320,000]	1,701 (13,924) [0 216,000]
	1.76 (1.04) [.92 6.42]	1.63 (.96) [.92 6.42]
	4.13 (.83) [.60 5.40]	4.17 (.84) [.40 5.40]

levels (β = 0.912, *t*(240) = 3.41, *p* = .008) before COVID-19, in line with hypothesis 2 (Table 5). Also, changes in financial stress mediated the association between savings and debts on the one hand and changes in mental health on the other, in line with hypothesis 3 (95% CI [.00662, 0292]). However, we did not find support for an association between savings (β = 0.081, *t*(161) = .272, *p* = .125) and debts (β = 0.021, *t*(316) = .95, *p* =1) on the one hand and mental health on the other. We found no support for income just before the pandemic (β = 0.098, *t*(232) = 2.08, *p* = .416) and income changes during the pandemic (β = -0.084, *t*(136)) = .994, *p* = .416) as explanatory variables for financial stress and mental health changes. Finally, we found no support for an indirect association between income and mental health (95% CI [-.04, .003]).

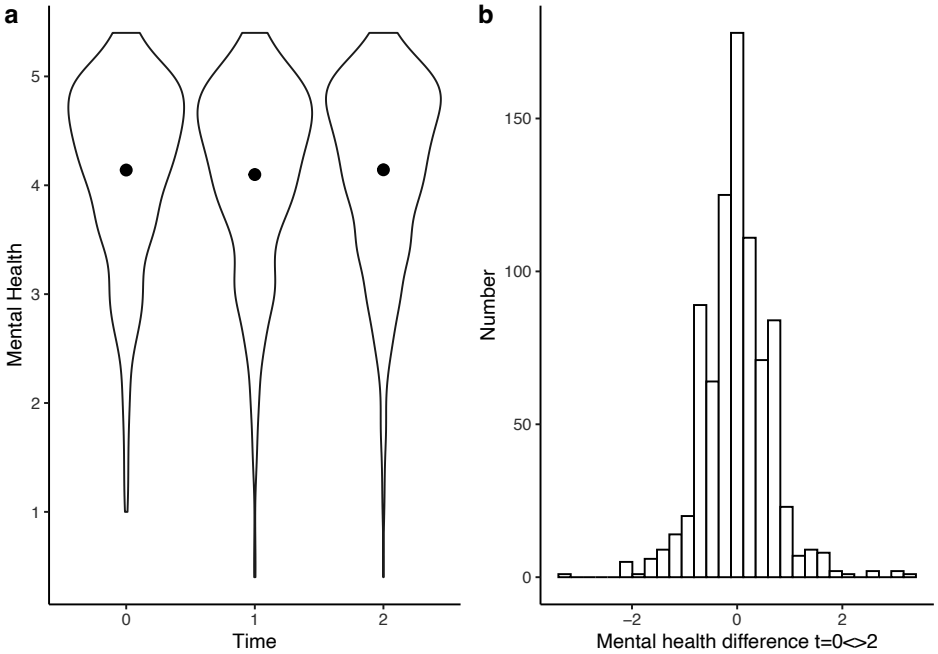

Figure 1. Development of mental health during COVID-19. a. Average mental health at t = 0 (November/December 2018), t= 1 (November/December 2019), and t = 2 (November/December 2020); b. Differences in mental health between t = 0 and t = 2

*Table 2. Pearson's Correlations (two-sided) between the three mental health measurements. Sig: * = <.05. ** = < .005, *** = < .0005.*

Mental health	***t* = 0**	***t* = 2**
t = 1	.73***	-
t = 2	.71***	.72***

*Table 3. Pearson's Correlations (two-sided) between the three financial stress measurements. Sig: * = <.05. ** = < .005, *** = < .0005.*

Financial stress	***t* = 0**	***t* = 1**
t = 1	.70***	-
t = 2	.69***	.81***

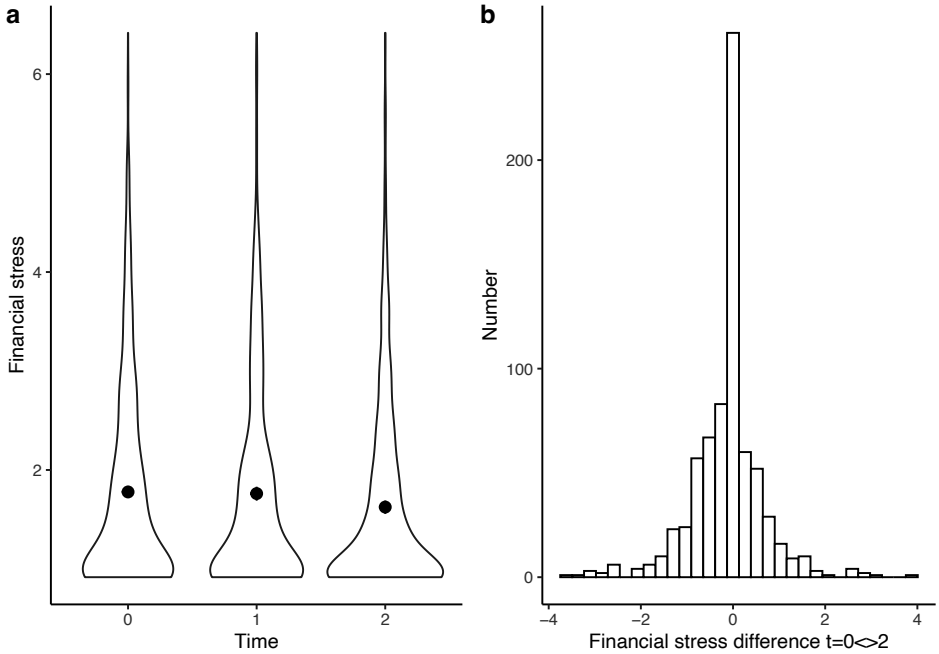

Figure 2. Development of financial stress during COVID-19. a. Average mental health at t = 0 (April 2018), t = 1 (February 2020), and t = 2 (August 2020); b. Differences in mental health between t = 0 and t = 2.

We did not find an association between time and mental health (β = -0.011, $t(913) = .50$, $p = 1$ and β = 0.005, $t(622) = -.21$, $p = 1$ for $t = 0$ and $t = 1$, respectively). This corroborates our earlier observation that, on average, mental health did not change during the assessed period before and during the COVID-19 pandemic. Moreover, we did not find support for a significant interaction between time and financial stress in predicting mental health (β = 0.019, $t(628) = .77$, $p = .1$ and β = 0.020, $t(392) = .75$, $p = 1$ for $t = 0$ and $t = 1$, respectively). This finding suggests that the strength of the relationship between financial stress and mental health did not change during the first six months of the COVID-19 pandemic. Of the control variables, only emotional stability explained mental health (β = - .501, $t(521) = -21.26$, $p < .001$).

*Table 4. Regression results for Equation (1). SE: standard error; p: adjusted p-value (two-sided t-test, adjusted with Benjamini and Yekutieli correction), For each variable, the standardized regression parameters (β), standard errors (σ), t-statistic (t), degrees of freedom, and p-value (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

Dependent variable: mental health	**β**	**σ**	***t***	***df***	***P***	
Intercept	-.160	.095	-1.69	551	.881	
Financial Stress	-.119	.023	-5.25	677	< .001	***
Adjusted Income (*t = 0*)	.098	.047	2.08	232	.416	
Δ Adjusted Income	-.084	.055	-1.53	136	.994	
Savings	.081	.030	2.72	161	.125	
Debts	.021	.022	.95	316	1	
t = 0	-.011	.022	-.50	913	1	
t = 1	-.005	.023	-.21	622	1	
Financial Stress * (t = 0)	.019	.024	.77	628	1	
Financial Stress * (t = 1)	.020	.026	.75	392	1	
Age	.029	.025	1.16	491	1	
Gender (F)	-.011	.020	-.54	776	1	
Education Level: 2	.151	.096	1.57	640	.994	
Education Level: 3	.022	.105	.21	584	1	
Education Level: 4	.110	.096	1.14	565	1	
Education Level: 5	.103	.095	1.09	598	1	
Education Level: 6	-.017	.108	-.15	497	1	
Household: no partner, with children	.158	.111	1.43	666	1	
Household: partner, no children	.145	.051	2.86	598	.095	
Household: partner, with children	.126	.056	2.23	575	.374	
Conscientiousness	.048	.023	2.09	442	.416	
Emotional Stability	-.501	.024	-21.26	521	< .001	***
Extraversion	-.064	.022	-2.89	488	.095	

We did not find an association between time and financial stress (β = 0.0284, *t*(754) = .136, *p* = .737 and β = 0.052, *t*(500) = 2.46, *p* = .078 for *t* = 0 and *t* = 1, respectively). This finding indicates that, on average, financial stress during the first six months of COVID-19 did not differ from financial stress pre-COVID-19. Age was negatively associated with changes in financial stress (β = 0.0928, *t*(476) = -3.11, *p* = .013), indicating that financial stress levels of younger respondents increased during COVID-19. Also, we found that the group with the lowest education level (primary school) experienced more financial stress than the other groups. We did not find associations between gender (β = -0.067, *t*(637) = -2.73, *p* = .039) and household composition on the one hand and financial stress on the

other. Of the three included personality traits, conscientiousness (β = -0.1188, $t(415) = -4.37$, $p < .001$) and emotional stability (β = -0.2403, $t(517) = 8.84$, $p < .001$) were negatively associated with financial stress increases.

*Table 5. Regression results of Equation (2) SE: standard error; p: adjusted p-value (two-sided t-test, adjusted with Benjamini and Yekutieli correction). For each variable, the standardized regression parameters (β), standard errors (σ), t-statistic (t), degrees of freedom, and p-value (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

Dependent Variable: Financial Stress	***Estimate***	***SE***	***t***	***df***	***p***	***Sig***
Intercept	.4653	.112	4.16	504	< .001	***
Adjusted Income (*t = 0*)	.1428	.087	1.65	98	.462	
Δ Adjusted Income	-.1753	.072	-2.42	95	.089	
Savings	-.1414	.040	-3.53	122	.005	**
Debts	.0912	.028	3.31	240	.008	**
t = 0	.0284	.021	1.36	764	.737	
t = 1	.0552	.022	2.46	500	.078	
Age	-.0928	.030	-3.11	476	.013	*
Gender (F)	-.0667	.024	-2.73	637	.039	*
Education Level: 2	-.4870	.117	-4.17	514	< .001	***
Education Level: 3	-.4442	.126	-3.52	511	.004	**
Education Level: 4	-.4636	.113	-4.09	550	< .001	***
Education Level: 5	-.5259	.113	-4.65	543	< .001	***
Education Level: 6	-.6026	.126	-4.77	505	< .001	***
Household: no partner, with children	.1417	.134	1.06	580	1	
Household: partner, no children	-.1274	.061	-2.09	538	.178	
Household: partner, with children	.0288	.067	.43	555	1	
Conscientiousness	-.1188	.027	-4.37	415	< .001	***
Emotional Stability	-.2403	.027	8.84	517	< .001	***
Extraversion	.0076	.026	.30	537	1	

In addition to the indirect relation (mediation) described above, we found that financial stress increases positively mediated the association between age (95% CI [.00369, .02]), gender (95% CI [.0025, .015]), and education level on the one hand and mental health decreases on the other (see Table 6). We found no support for an indirect association between household composition and mental health changes, with financial stress as the mediator. Finally, we found that financial stress increases also mediated the association between conscientiousness (95% CI [.00666, .0232]) and emotional stability (95% CI [-.0417, -.0168]) on the one hand and mental health decreases on the other.

DISCUSSION

The current study examined the role of financial vulnerability and financial stress in explaining individual differences in mental health changes during COVID-19. In a longitudinal study, we compared mental health in a large sample of the Dutch population before and during the pandemic. We used a random intercepts model, which enabled us to analyze the dynamic relationships between financial stress and mental health. We operationalized mental health through the Mental Health Inventory (MHI-5)[60], which asks respondents how often they felt nervous, down, calm, depressed, and happy in recent weeks. Financial stress is a psychological concept characterized by the subjective experience of lacking financial resources to cope with demands. We measured financial stress through the Psychological Inventory of Financial Scarcity (PIFS)[48,49].

We found that changes in financial stress related negatively to changes in mental health during the pandemic. Having few liquid savings and having large amounts of consumer debt before the pandemic outbreak explained increased financial stress during the pandemic. Low savings and high consumer debt levels are two important aspects of financial vulnerability. Households with few savings are less protected against income shocks or unexpected expenditures. Especially in a time of economic uncertainty, lacking savings may result in feelings of not being in control of one's financial situation and worries about being unable to meet financial obligations. Thus, low savings levels may result in increased financial stress.

Similarly, having debts may trigger worries about being unable to repay them because of the anticipation of future income drops. Also, having debts may increase feelings of dependency on others[57]. Thus, having debts in economically uncertain times such as COVID-19 may increase financial stress. We also found that changes in financial stress mediated the relation between savings and debts on the one hand and changes in mental health on the other. Theoretically, the causal relationship between financial vulnerability and mental health could go in both directions. However, because we used savings and debts before the pandemic as independent variables, which does not seem likely in this case. The relationship could also be confounded by a variable we did not include in our model. Although we cannot make causal inferences, this finding confirms earlier findings that financial vulnerability may be a risk factor for mental health in a pandemic.

We found no support for income or income changes explaining financial stress changes. Savings and debts are better predictors of financial stress changes than having a low income. The finding that decreasing income does not explain increasing financial stress may be due to governments' comprehensive income support packages immediately after the pandemic outbreak. As a result, few households experienced income drops during the third measurement. The variability in income may have been too small to explain variability in financial stress. We did not find support for an interaction between time and financial stress in predicting mental health, which suggests that the strength of the relationship between financial stress and mental health did not significantly change during the pandemic.

Mean levels of mental health did not change in the first six months of the pandemic compared to the pre-pandemic situation. This flat course of average mental health, however, masked underlying heterogeneity. For four out of five respondents, mental health either increased or decreased. This finding corroborates earlier findings of high proportions of unexplained heterogeneity in mental health development during COVID-19[8].

Our results suggest that between-person differences in the changes in financial stress may partly explain the heterogeneity in changes in mental health after controlling for age, gender, education level, household composition, and personality traits. Our study adds to the fast-growing knowledge of mental health development during COVID-19. We had the opportunity to use longitudinal data collected before and during COVID-19. Earlier studies examining mental health during COVID-19 were mostly cross-sectional or utilized data collected during the pandemic only. Our study is the first to examine the role of pre-pandemic savings, debts, income, and financial stress in mental health changes during the pandemic.

There are also some limitations and opportunities for further research. First, we used data collected during the first year of the pandemic outbreak. The mental health consequences of the COVID-19 crisis may be present for a long time and peak later than the actual pandemic[4]. Also, there is ample evidence of the effects of chronic stress on physical and mental health and childhood development[81,82]. For these reasons, extending the study of mental health development and (financial) stress may be fruitful to include more prolonged periods. Second, we examined the role of financial stress in general mental health changes during COVID-19. Future studies could examine

the role of financial stress during COVID-19 for a broader range of mental health symptoms and disorders, such as post-traumatic stress, insomnia, and loneliness. A third avenue for further research lies in understanding the effect of financial stress on physical health development. There is rich literature on the relationship between socioeconomic status and aspects of physical health, such as cardiovascular disease, arthritis, diabetes, chronic respiratory diseases, and cervical cancer[50,51]. Examining the prolonged effects of financial stress during COVID-19 in developing these and other illnesses would be worthwhile. Such examinations could help disentangle the complex relationship between socioeconomic status and health and the role of lifestyle therein. They could establish the relative contribution of the different pathways (i.e., through the disease itself, the pandemic containment measures, and the economic consequences of the pandemic).

The results of our study point to several policy implications. First, our results confirm the importance of safeguarding financial security for financially vulnerable households in crises. Soon after the outbreak, governments worldwide implemented unprecedented income support packages. These support packages are currently being phased out while economic consequences may endure or only start to arise. Financially vulnerable households are the most likely to experience the prolonged economic consequences of the pandemic in the aftermath of the health crisis because they do not have the financial resources to deal with economic shocks.

Second, mental health programs should include financially vulnerable groups. Many of the studies referenced in this article have called upon health professionals, policymakers, and researchers to develop interventions to counter the adverse psychological consequences of the pandemic, especially for vulnerable groups[3,7,21]. The current study results confirm that such programs should reach out to financially vulnerable households and address their specific mental health needs.

Third, mental health interventions should address the psychological symptoms of COVID-19, such as post-traumatic stress, anxiety, depression, loneliness, and insomnia, and prevent such symptoms by mitigating financial stress because control is an essential aspect of financial stress. Financial counseling and coaching to increase control and self-efficacy provide promising avenues for reducing financial stress and promoting mental health, especially for financially vulnerable households[48,82].

Finally, an important lesson for future pandemics and other economic shocks is promoting buffer savings and avoiding unnecessary debts. This may make households more resilient to the adverse mental health consequences of future shocks. In sum, policymakers and professionals from the mental health and finance fields can benefit from the notion that mental health and financial security go hand in hand by incorporating financial security into mental health programs and vice versa.

DATA AVAILABILITY

The current study used data from the LISS panel administered by Centerdata[58]. Researchers are encouraged to contact Centerdata to obtain the datasets used in this study. Detailed instructions for accessing LISS panel data are available here: *https://www.lissdata.nl/access-data*. A list of data sets used in the current study is available at the Open Science Framework (OSF): *https://osf.io/4ctsr/*. Centerdata policy does not allow authors to provide access to data sets directly to other researchers.

CODE AVAILABILITY

We used R version 4.1.0[84] to perform statistical analyses. The code used to process that data and perform the analyses is available from the Open Science Framework through the following link: *https://osf.io/4ctsr/*.

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CHAPTER 2. APPENDIX
DESCRIPTIVES

Table A1. Sample characteristics by mental health change

Net Income (t=0)
Net Income (*t = 0*)
Net Income (*t* = 1)
Adjusted Income (*t* = 0)
Adjusted Income (*t = 1*)
Adjusted Income (*t* = 2)
Age
Education Level
1: primary school
2: vmbo (intermediate secondary education)
3: havo/vwo (higher secondary education/preparatory university education)
4: mbo (intermediate vocational education)
5: hbo (higher vocational education)
6: wo (university)
Gender:
Gender: Female
Household Composition
1: no partner, no children
2: no partner, with children
3: partner, no children
4: partner, with children
Buffer? (Y)
No. Debts
0
1
2
5
Financial Stress (t=0)
Financial Stress (*t = 0*)
Financial Stress (t=2)
Mental Health Index (t=0)
Mental Health Index (*t = 0*)
Mental Health Index (t=2)

	Decreased (N = 3,341)	Unchanged (N = 1,781)	Increased (N = 3,211)
	32,400 (22,068, 46,755)	30,648 (23,441, 42,723)	34,417 (21,025, 46,080)
	32,950 (22,460, 47,075)	33,290 (25,200, 46,350)	35,280 (22,482, 49,245)
	33,480 (22,695, 48,796)	34,186 (25,200, 47,020)	35,868 (22,800, 50,400)
	21,912 (16,795, 29,422)	23,011 (17,770, 28,710)	21,949 (16,981, 29,556)
	22,708 (17,518, 30,043)	25,329 (19,092, 31,200)	24,529 (17,521, 32,502)
	23,331 (17,395, 31,291)	25,584 (19,092, 32,117)	24,549 (17,395, 33,213)
	54.2 (17.4) [18.0 91.0]	57.1 (15.0) [20.0 87.0]	53.1 (17.3) [18.0 90.0]
	19 (5.7%)	9 (5.1%)	18 (5.6%)
	69 (21%)	42 (24%)	64 (20%)
	42 (13%)	15 (8.4%)	40 (12%)
	84 (25%)	37 (21%)	85 (26%)
	88 (26%)	56 (31%)	74 (23%)
	31 (9.3%)	19 (11%)	40 (12%)
	183 (55%)	84 (47%)	177 (55%)
	97 (29%)	56 (31%)	93 (29%)
	17 (5.1%)	7 (3.9%)	10 (3.1%)
	130 (39%)	72 (40%)	129 (40%)
	90 (27%)	43 (24%)	89 (28%)
	122 (68%)	70 (75%)	123 (73%)
	287 (89%)	162 (95%)	277 (89%)
	35 (11%)	8 (4.7%)	31 (10.0%)
	1 (0.3%)	1 (0.6%)	3 (1.0%)
	1 (0.3%)	0 (0%)	0 (0%)
	1.79 (1.07) [0.92 6.42]	1.55 (0.91) [0.92 4.75]	1.80 (0.97) [0.92 5.25]
	1.81 (1.06) [0.92 6.17]	1.51 (0.84) [0.92 5.00]	1.81 (1.04) [0.92 5.92]
	1.67 (1.01) [0.92 6.42]	1.41 (0.78) [0.92 4.25]	1.66 (0.93) [0.92 5.75]
	4.31 (0.69) [1.40 5.40]	4.52 (0.78) [1.20 5.40]	3.77 (0.91) [1.00 5.20]
	4.04 (0.80) [0.60 5.40]	4.42 (0.86) [0.40 5.40]	4.03 (0.86) [1.20 5.40]
	3.75 (0.83) [0.40 5.20]	4.52 (0.78) [1.20 5.40]	4.35 (0.72) [1.40 5.40]

Chapter 3

Economic predictors of the subjective experience of financial stress

Based on:
Simonse, O., Van Dijk, W. W., Van Dillen, L. F. & Van Dijk, E. Economic predictors of the subjective experience of financial stress. *Journal of Behavioral and Experimental Finance* **42,** 100933 (2024). *https://doi.org/10.1016/j.jbef.2024.100933*

ABSTRACT

The subjective experience of financial stress has profound implications for well-being, health, cognitive performance, and decision-making. We conceptualized financial stress as a psychological construct comprising four components: 1) an appraisal of insufficient financial resources, 2) an appraisal of lack of control over one´s financial situation, 3) financial worries and rumination, and 4) a short-term focus. In empirical studies, financial stress is often associated with isolated economic correlates such as low income, savings, or debt. The current study examined the association of financial stress with five objective aspects of households´ economic situation: income, saving, debts, income volatility, and employment. This enabled us to examine these economic factors' relative contributions to predicting financial stress. We used a probability sample of the Dutch population (N = 1,114). Income and buffer savings had the largest contributions to predicting financial stress. The number of debts had a smaller relative contribution to predicting financial stress, whereas we did not find support for debt amount as a predictor of financial stress. Employment predicted financial stress, but only for households at the lowest end of the income spectrum. We found no support for income volatility predicting financial stress. These results imply that research and policy on financial stress should have a broader scope than income alone and should take a more integrative approach to households' financial situation, considering savings, number of debts, and unemployment.

INTRODUCTION

In financially challenging circumstances, people often experience financial stress[1]. The notion of financial stress is not limited to lower-income countries. In the third quarter of 2022, most Americans (56%) indicated that price increases were causing financial hardship for their household[2]. In the UK, 7.8 million people were finding it a heavy burden to keep up with their bills, and 37% of Dutch households had difficulty making ends meet[3,4].

We define financial stress as a psychological construct reflecting a state where pressing financial concerns surpass available resources, endangering well-being[5]. Financial stress includes subjective appraisals of the situation and affective and cognitive responses. We incorporate two appraisals: insufficient financial resources and lack of control over one's financial situation. The first appraisal captures the (potential) harmfulness of the situation, whereas the second refers to coping potential - the perceived ability to adequately deal with the (potentially) harmful situation. We also include affective and cognitive responses, namely financial worries and rumination, and short-term focus.

Our definition of financial stress is based on existing psychological stress frameworks[6,7]. In these frameworks, a threat is defined as a state where an individual anticipates a confrontation with a stimulus they appraise as endangering essential values and goals. Research shows that a situation appraised as a strain on one's resources predicts psychological symptoms, such as anxiety and depression[8], and that a perceived lack of coping ability increases appraised threat[7]. Our definition of financial stress is consistent with psychological stress, an adaptive physiological response to a real or perceived threat[9–12]. Financial stress is the psychological stress resulting from one's financial situation.

We now describe how financial stress, as defined above, complements other concepts used in the literature, particularly financial well-being, subjective wealth, financial vulnerability, financial fragility, and financial worry.

Financial stress is a narrower concept than financial well-being, defined by Brüggen et al.[13] as "the perception of being able to sustain current and anticipated desired living standards and financial freedom." (p. 229). Financial stress focuses on people's current financial situation, whereas financial well-being includes the current and anticipated financial situation. Also, financial stress is understood as the inability to meet financial demands, whereas financial well-

being is understood as the ability to meet such demands. Netemeyer et al.[14] define financial well-being as current money stress and future financial security. Current money stress involves being behind with one's finances, feeling that one's finances control one's life, and being obsessed with money. The second aspect of Netemeyer's definition - future financial security - resembles Hoffmann et al.'s[15] definition of financial well-being as expected financial security. Our definition of financial stress resembles Netemeyer's current money stress but adds the two components of affective and cognitive responses consistent with psychological stress frameworks.

Financial stress also differs from financial vulnerability, defined by Salisbury et al.[16] as "the risk of incurring future harm, given the consumer's current access to various financial resources." (p. 1). Financial vulnerability resembles financial fragility, defined as "the sensitivity of household arrears and insolvencies to macroeconomic shocks"[17]. Clark and Mitchell[18] developed a resilience index that reflects a household's capacity to respond to economic shocks, namely how able it is to respond to an unexpected loss of earnings, whether it has developed retirement and spending plans and tracks spending, how it perceives the impact of current debt on spending, and its level of concern regarding finances. Lusardi et al.[19] proxied financial vulnerability with debt-to-income ratio. Hoffmann and McNair[20] developed a measure of financial vulnerability based on risk factors that may threaten financial stability, such as age, education level, health, income, debt, and financial literacy. Thus, financial stress focuses on one's experienced inability to meet current financial requirements, whereas financial vulnerability involves the risk of being unable to meet financial demands in the future.

Finally, our conceptualization of financial stress encompasses financial worry, defined as "repeated and negative thinking about the uncertainty of one's (future) financial situation," and financial rumination, defined as "repetitive, passive, and pessimistic thinking about the possible causes and consequences of one's financial concerns"[21]. This definition resembles Xiao and Kim's[22] definition of financial stress as a "psychological state worrying about personal finance." It is similar to financial anxiety[23], defined as worrying and anxiety about current and future financial situations.

Financial stress can profoundly impact people's lives, affecting their well-being, health, cognitive performance, and behavior. The literature shows that financial stress has adverse consequences for overall well-being and mental health outcomes such as anxiety and depression[14,24–29]. Financial stress also

affects cognitive processes by shifting the attentional focus toward the most pressing needs and away from less urgent ones[1,30,31]. Moreover, financial stress has positive and negative consequences for cognitive performance. On the positive side, people lacking financial resources perform better on selective attention, vigilance, detecting imminent dangers and opportunities, tracking conditions that change rapidly, persisting when procuring an immediate reward, and valuing money[32,33]. Although the narrowed focus that results from financial stress is arguably a necessary response to urgent economic challenges, it comes at a cost. There is increasing evidence that financial stress is negatively related to various executive functions, such as self-control, planning, working memory, and cognitive flexibility[1,5,34–41]. A growing body of literature shows that financial stress elicits behaviors that sustain or even exacerbate economic hardship, such as impulse buying, gambling, overspending, suboptimal investing, decreased job search effectiveness, the use of alternative financial services, the use of buy now pay later services, and overborrowing[23,28,42–46].

Understanding the economic predictors of financial stress is crucial to reducing financial stress and improving downstream cognitive, affective, and behavioral outcomes, well-being, and health. The literature examining the economic predictors of financial stress has primarily focused on income as the explanatory variable. Since income substantially influences the availability of financial resources, it is an intuitive predictor of financial stress. As we will discuss later, the literature about the relationship between income and financial stress is ambiguous, suggesting that other economic factors may also play a role. Research in mental health psychology and other fields, for example, indicates that mental well-being and stress are not only associated with income but also with economic factors such as savings, debts, income volatility, and employment. Well-being has a positive relation with savings[47,48] and employment[49,50] and a negative relation with debts[51–53] and income volatility[54,55]. Yet, studies on the relationship between one's economic situation and stress have typically focused on one or two economic predictors in isolation without considering other economic predictors. These studies, therefore, do not reveal the relative contributions of different aspects of one's economic situation in predicting financial stress. Also, in these studies, an observed relationship between financial stress and an isolated economic predictor (e.g., income) may partly reflect a relation with an unmeasured predictor (e.g., savings or debt). Finally, it stands to reason that savings, debts, income volatility, and employment are more strongly related to financial stress for lower-income households. Although some studies corroborate this notion[56,57], the literature on interactions between income and other aspects of one's economic situation in predicting financial stress is scarce.

We need to take a more integrative approach to provide a better and more comprehensive account of the factors predicting financial stress. The current research examines the relative importance of five aspects of one's economic situation - income, savings, debts, income volatility, and employment status - in predicting financial stress. Also, it examines whether the associations differ between lower- and higher-income households. Finally, we statistically control for well-established confounders, such as age, education level, gender, and personality traits.

CONCEPTUAL FRAMEWORK

In this paragraph, we explore which objective aspects of households' objective economic situation may be associated with financial stress. Below, we provide theoretical arguments and empirical evidence on associations of income, savings, debts, income volatility, and employment with elements of financial stress (the appraisals of having too few financial resources and lacking financial control and the accompanying affective and cognitive responses). Also, we provide theoretical arguments for income as a moderator of the association between the other four aspects of households' economic situation (debt, savings, income volatility, and employment) and financial stress. We present our conceptual framework based on the findings from theory and literature.

Income. Low-income households often juggle paying the bills and providing for their families. The literature shows that this may trigger feelings of financial stress, an increased focus on the present, and a decreased perception of control. For example, Johar et al.[58] concluded that "the poor, both when classified as having incomes below 40,000 and on a continuous scale, discounted the future more" (p. 209). Sheehy-Skeffington[41] argued that a low income increases perceived resource scarcity, which, in turn, hampers executive functioning and decreases self-regulation. Other studies have cast some doubt on the importance of income in predicting adverse mental states and behavior. For example, De Bruijn and Antonides[59] concluded that income had limited direct effects on financial worries and rumination. Beenackers et al.[60] found that financial strain and self-control were associated with health behaviors but found no support for an association between income and health behavior. In sum, the evidence of the relationship between income and different aspects of financial stress (lack of control, financial worries and rumination, and short-term focus) is mixed. Some studies find a negative association, whereas others find limited or no support for an association.

Savings. Savings may serve as buffers against unexpected expenditures and income shocks, and this could protect against financial stress. Scholars have long recognized the importance of assets for household well-being, although there is some debate on the effect size[47,61]. Bernheim et al.[62] found that having low initial assets made exercising self-control difficult, resulting in poverty-aggravating behavior. Ruberton et al.[48] found that having a financial buffer contributed to financial well-being. They noted "the importance of holding minimal financial savings, but also the relative unimportance of having wealth above sufficiency levels" (p. 579).

Conversely, financial stress may inhibit savings. Financial stress increases a short-term focus and may result in avoiding financial decisions[26,30,63]. Alsemgeest[64] found a negative association between stress and retirement savings. It is plausible that this association is stronger as income decreases, although there is no empirical support for this presumption. First, the higher a household's income, the more flexibility they may have in dealing with unexpected expenditures. Thus, lacking savings may have less impact on the stress levels of higher-income households. Second, when income is higher, it may be less challenging to make ends meet and set money aside from what is left at the end of the previous month.

Debts. Debts may result in financial stress for at least three reasons. First, debts can indicate short-term or long-term financial difficulties: When people have insufficient income or savings to make ends meet or pay the bills, they may borrow money[52]. Second, debt repayments and interest decrease disposable income, potentially making it more challenging to make ends meet. Third, the thought that one needs to repay debts in the future may cause worries and rumination. If debts are out of control, consumers will face financial strains such as high debt payment-to-income ratio, debt payment delinquency, and even bankruptcy[65]. From a review of debt literature, Tay et al.[66] concluded that debt may affect well-being through two channels. First, debt affects financial well-being, a component of overall well-being. Second, debts pose a strain on financial resources, which, in turn, lowers well-being. Results from previous studies indicated that debts have a small negative association with happiness[67] and that debt delinquency is associated with financial stress[22].

Yet, the association between debt and financial stress may be more complex than that. First, a higher debt may also go hand in hand with lower financial stress since higher debts usually coincide with higher incomes; in many countries, the amount of credit allowed depends on income. Debts may provide access to credit, convenience, liquidity, and even leverage consumers would not otherwise have[65]. Also, debt may enable purchasing goods and services that increase life satisfaction, which is a (negative) correlate of financial stress[5]. Second, the financial burden associated with debts may depend on the type of debt. Previous studies have found that mortgage debts, student loans, credit card debts, and vehicle debts have different associations with financial burdens[65,67]. Third, the causality may run in the opposite direction. Financial stress causes cognitive impairment and short-term focus[26,38,63]. To make ends meet today, households with financial stress may underestimate the cost of borrowing and be inclined to overborrow[42]. Fourth, previous studies have revealed that the number of debts

is more predictive of financial stress than the total debt amount[68,69]. It is argued that people keep each loan in a separate "mental account," and each debt's first few dollars create the most significant mental load[70].

In sum, the association between debts and financial stress is complex. The literature tends towards a positive association between debts and financial stress. The association may be stronger for lower-income households[66]. For them, having debts may trigger more worries about being unable to repay the loan or pay the interest.

Income volatility. If one's income changes from month to month, this may increase feelings of lack of control and financial stress. Fluctuating income can evoke financial stress due to worry over difficulty paying bills or providing for one's family. Sudden large financial shocks may also result in decreased buffers and increased debts, increasing financial stress. Also, unexpected financial shocks may result in feeling less in control of one's finances. Both experimental and longitudinal studies find that income volatility increases financial stress, especially for lower-income households. For example, Lichand and Mani[71] conducted a lab-in-the-field experiment using rainfall variations as natural income shocks with Brazilian farmers. They concluded that "the cognitive burden imposed by income uncertainty makes farmers 'penny wise and pound foolish'" (p. 4). Other studies have confirmed that income volatility positively relates to financial stress, especially for lower-income households[72,73]. Empirical evidence suggests a positive association between financial shocks and subjective financial well-being. In a study among US households, the Consumer Financial Protection Bureau[74] found that the financial well-being score of households that experienced a financial shock in the past 12 months is significantly lower than that of households that did not experience a shock. Codagnone et al.[75], for example, found that during COVID-19, 42.8% of the respondents had a high risk of stress, anxiety, and depression based on their level of economic vulnerability and their exposure to a negative economic shock. Bufe et al.[76] found that the experience of an income shock was associated with a large decline in subjective financial well-being.

In contrast, the experience of an expense shock was associated with a more modest decline. We argue that income volatility may have a stronger association with financial stress for lower-income households. An income shock more likely results in an inability to make ends meet as income decreases. In contrast, an income shock may be easier to deal with as income increases. Thus, households with fluctuating incomes may experience less control of their finances as income decreases.

Employment. Losing one's job may result in worries about being able to provide for one's family and pay the bills, especially because households' expenses are fixed to a large extent (housing, utilities, insurance, etc.). Indeed, several studies have found higher financial stress among the unemployed[47,77]. Another study found that labor income (vs. nonlabor) income contributes more to financial satisfaction[78]. Again, the causal relation may also run in the other direction:

Increased stress levels may result in more difficulty finding a job. For example, Gerards and Welters[44,79] found that financial strains resulted in less effective job search and labor market outcomes. We argue that unemployment may have a stronger association with financial stress as income decreases. Higher-income unemployed may have other income sources, such as investments. Also, in the Dutch context, unemployment benefits drop as time passes. The lower the income, the longer unemployment likely lasts, which may increase financial worries and rumination.

The current study. The theoretical arguments and empirical evidence summarized above suggest that different aspects of one's economic situation may correlate with financial stress, a psychological construct reflecting a state where pressing financial concerns surpass available resources. Studies of the economic correlates of financial stress often consider one or two aspects of households' financial situation in isolation. The associations found in these studies may, therefore, be overestimated. Other variables not included in these studies may partly explain the associations found. There is no coherent picture of how different elements - in conjunction - correlate with financial stress. The current research, therefore, takes a more integrative perspective on households' economic situation by including five aspects: income, savings, debts, income volatility, and employment. We hypothesize that a low income, insufficient savings, more debts, income volatility, and unemployment all contribute to predicting more financial stress (see Figure 1). Moreover, we hypothesize that income moderates the relationships of savings, debts, income volatility, and employment on the one hand and financial stress on the other; we hypothesize the associations will become stronger as income decreases.

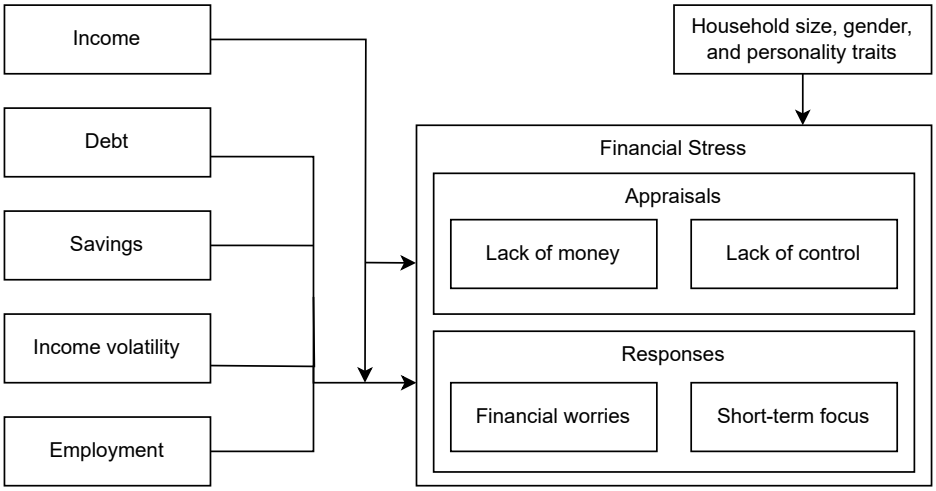

Figure 1. Conceptual framework. Objective aspects of households' economic situation (income, debt, savings, income volatility, and employment) are associated with financial stress. Income moderates the association between the other objective aspects and financial stress. Financial stress is a psychological construct involving the subjective experience of lacking financial resources to cope with demands. It consists of two appraisals (lack of money and control) and two responses (financial worries and rumination and short-term focus). The directions of the arrows indicate that economic aspects predict financial stress; they do not suggest causation.

METHODS

Data

We employed cross-sectional data administered by Centerdata[80]. The panel is based on a probability sample of households drawn from the population register by Statistics Netherlands. We linked survey data on financial stress with economic, demographic, and psychological variables. While we were thus able to establish correlations, the cross-sectional data did not allow us to make causal claims. Table 1 contains an overview of the variables relevant to our study. Our sample consisted of respondents to a questionnaire in April 2018 that included a measure of financial stress. After removing eight empty surveys, the sample contained 1,114 respondents. Detailed steps needed to obtain the data and perform the analyses and the accompanying R-scripts used to create the dataset, perform the analyses, and produce the output are available in the online supplemental materials.

Dependent variable

We used the 12-item Psychological Inventory of Financial Scarcity (PIFS) developed by Van Dijk et al.[5] to measure financial stress (M = 1.96, SD = 1.12, Cronbach's α = .93). Their psychometric evaluation shows that the PIFS is a reliable and valid measure. It combines scarcity theory with frameworks of financial stress. The PIFS consists of four components (Table 2). The first two components capture appraisals of insufficient financial resources and lack of control over one's financial situation. The third component captures financial worries and rumination, whereas the fourth component captures a focus on the short term. The appraisal of insufficient resources represents a perceived threat. The lack of control over one's financial situation represents the inability to deal with such a perceived threat adequately. Financial worries and rumination, and short-term focus are affective and cognitive responses to the perceived threat.

The PIFS is consistent with psychological stress research, showing that the appraisal of lacking financial resources predicts psychological symptoms, such as anxiety and depression[8], and research showing that a perceived lack of control increases experienced financial threat[82]. Results of exploratory and confirmatory factor analyses of the PIFS based on five studies indicated that the PIFS has a high internal consistency and captures a construct that fits both a one-factor structure and a four-factor (sub)structure[5]. In our study, the correlations between the subscales of the PIFS were high (between .61 and .78; Table 3), in line with previous findings that they form a coherent overall scale.

Independent variables

Income. Centerdata measures net monthly household income in euros. We corrected for household size because the needs of a household grow with each additional member. To consider economies of scale, we adjusted household income by dividing it by the square root of household size, according to OECD guidelines[83]. One respondent had an extraordinarily high net monthly income of € 231,262, which we replaced with a missing value.

Savings may serve as buffers against unexpected expenditures and income shocks. Ruberton et al.[48] stressed the importance of a minimal buffer in the form of liquid wealth for well-being. We defined buffer as a dichotomous variable equaling one if a household's liquid assets exceeded a threshold depending on income and household size and zero otherwise. We argue that higher-income families need a higher buffer because they have more fixed expenditures and own more property. Based on the Buffer Calculator provided by Nibud[84], we used the following formula to define the threshold for having sufficient buffer: € 600 + [monthly income] + € 400 * [household size]. We included the amount of household liquid savings in our analyses and excluded other types of wealth, such as real estate and long-term investments. Respondents were asked: "What was the total balance of your banking account, savings accounts, term deposit accounts, savings bonds or savings certificates, and bank savings schemes on 31 December 2018?". If they responded, "I don't know," the questionnaire asked, "To what category did the total balance (total value) belong on 31 December 2018 (positive or negative)?" and given 15 categories (less than € 50 to € 25.000 or more). We used the category midpoints to calculate savings. We performed a robustness check with the amount of liquid savings instead of buffer as an independent variable.

Table 1. Operationalizations and descriptive statistics of the variables in our model. The numbers (N) and percentages (%) are provided for the categorical variables. For the numerical variables, means, standard deviations (SD), minimum (Min), and maximum (Max) values are provided.

Variable	***Operationalization***
Dependent variable	
Financial stress	The subjective experience of lacking financial resources to cope with demands (Table 2).
Independent variables	
Net income	Net monthly household income (€).
Income	Adjusted income: net income divided by the square root of household size.
Savings	The total balance of banking accounts, savings accounts, term deposit accounts, savings bonds or savings certificates, and bank savings schemes on 31 December 2018.
Buffer	A dichotomous variable equaling one if a household's liquid assets exceeded a threshold depending on income and household size and zero otherwise. The threshold was calculated as follows: € 600 + monthly income + € 400 * household size. (based on the Buffer Calculator provided by the National Institute for Family Financial Information (Nibud)).
Number of debts	The number of positive responses to the question whether respondents had (a) one or more personal loans, revolving credit arrangement(s), or financing credit(s) based on a hire-purchase or installment plan, (b) a loan or credit arrangement based on a pledge, (c) overdue payments on one or more credit cards (d) money loaned from family, friends, or acquaintances, and (e) any other credits, loans, or debts.
Debt Amount	The total amount of loans, credits, and debts on 31 December 2017.
Income volatility	Number of months in which net income was lower than in the previous month, calculated of the last twelve months.
Employed	A dichotomous variable that equaled zero if the responded "Job seeker following job loss," "First-time job seeker," "Has (partial) work disability," or "Performs unpaid work while retaining unemployment benefit," and one otherwise.

	Categorical			Numerical			
	Category	***N***	**%**	***Mean***	***SD***	***Min***	***Max***
				1.96	1.12	1.00	7.00
				3,048	1,645	0	12,114
				2,051	916	0	6,994
				30,458	67,978	-8,000	662,957
	No	131	26%				
	Yes	369	74%				
	0	872	89%				
	1	99	10%				
	2	8	1%				
	3	1	0%				
	5	2	0%				
				2,213.59	18,100.36	0	320,000
	0	921	83%				
	1	156	14%				
	2	28	3%				
	3	7	1%				
	4	1	0%				
	6	1	0%				
	No	73	7%				
	Yes	1,042	93%				

Table 1. Continued

Variable	***Operationalization***
Control variables	
Gender	
Age	Calculated from the date of birth.
Household size	Number of members in the household.
Education level	As defined by Statistics Netherlands.
Openness to experience	Measured with Goldberg's [80] Big-Five index on a 7-point Likert Scale (50 items in total).
Conscientiousness	
Agreeableness	
Extraversion	
Emotional stability	

Debts. Given that the number of debts is more predictive of financial stress than the total debt amount[68,69], we included the number of debts as an independent variable in our analysis. We also argue that, for most households, having a mortgage contributes less to financial stress than other types of debt since the home's value usually amply compensates the mortgage loan's value. Student loans in the Netherlands have favorable conditions and are waived if one has difficulties repaying them. We, therefore, excluded mortgages and student loans from our analyses. The survey asked respondents to indicate whether they had (a) one or more personal loans, revolving credit arrangement(s), or financing credit(s) based on a hire-purchase or installment plan, (b) a loan or credit arrangement based on a pledge, (c) overdue payments on one or more credit cards (d) money loaned from family, friends, or acquaintances, and (e) any other credits, loans, or debts. We expect these types of debts to predict financial stress, although they are not necessarily problematic. We regard debts as problematic when people fail to repay them or for which people default (see, e.g., Roos et al., 2021). We performed two robustness checks with alternative operationalizations of debt, namely debt

	Categorical			Numerical		
Category	N	%	Mean	SD	Min	Max
Male	495	45%				
Female	607	55%				
			53.26	17.78	18	92
			2.33	1.25	1	9
primary school	62	6%				
vmbo	218	20%				
havo/vwo	130	12%				
mbo	267	24%				
hbo	281	26%				
wo	143	13%				
			4.23	0.47	3.20	5.20
			4.54	0.49	2.80	5.70
			4.65	0.55	3.10	5.80
			3,80	0.62	2.10	5.50
			5.03	0.62	3.60	6.60

amount and debt-to-income ratio, defined as the debt amount divided by adjusted monthly income - as an alternative measure of debt. Respondents with one or more of the types of debt above were asked: "What was the total amount of the loans, credits, and debts that you had on 31 December 2017?" This survey item excluded mortgages and student loans. If they responded, "I don't know," they were asked, "To what category did the loans, credits, and debts belong on 31 December 2017?" and given 14 categories (less than € 500 to € 100.000 or more). We used the category midpoints in our calculations.

Income volatility. Two possible indices of income volatility are the relative size and the number of adverse income shocks in a given period. Prause et al.[85] found that the latter was a better predictor of psychological depression than the former; an income loss results in the need to cut expenditures and may cause difficulty paying the bills. When income in one month was lower than income in the previous month, we regarded that as an adverse income shock. We used the number of adverse income shocks in the twelve months preceding the financial

stress measurement as the primary measure of income volatility. We performed a robustness check with the relative size of income shocks as a measure of income volatility. For this measure, we calculated the absolute differences in income changes from one month to the other, added them together, and divided the outcome by income.

Table 2. Items of the Psychological Inventory of Financial Scarcity (PIFS) and its subscales

Participants indicated to what extent they disagreed or agreed with each statement (1 = *totally disagree*; 7 = *totally agree*).
Subscale 1 (Lack of money, α = .82) • I am often short of money. • It's common for me not to be able to pay my bills on time. • I often don't have money for the things I really need.
Subscale 2 (Lack of control, α = .88) • I feel like I have little control over my financial situation. • I am not able to manage my financial affairs myself. • When I think about my financial situation, I feel powerless.
Subscale 3 (Financial worries and rumination, α = .73) • I wonder all the time if I have enough money. • I often find it difficult to think about anything other than my financial situation. • I often worry about money.
Subscale 4 (Short-term focus, α = .79) • I'm only concerned with what I have to pay now. I'll see the rest later. • Because of my financial situation, I live from day to day. • I don't consider things I'll have to pay for in a while.

Table 3. Spearman's correlations between the four subscales of the PIFS.

Subscales	2	3	4
1. Money shortage	.78	.67	.70
2. Lack of control		.61	.71
3. Financial worries and rumination			.65
4. Short-term focus			

Employment. Centerdata asks respondents to select their primary occupation from 14 options. We defined employment as a dichotomous variable that equaled zero if they responded "Job seeker following job loss," "First-time job seeker," "Has (partial) work disability," or "Performs unpaid work while retaining unemployment benefit," and one otherwise.

Control variables

We included several control variables: gender, age, education level, household size, and personality traits. Previous studies show that financial well-being differs between men and women[86]. Income tends to have an inverse-U relationship with age and rise with education level. Therefore, age and education may confound the association between income and financial stress. Likewise, having a larger household may affect the association between one's economic situation and financial stress; being responsible for a spouse and children may increase worries about being able to provide for them. Several studies indicate that personality traits may be associated with financial behavior and financial stress. For example, Gerhard et al.[87] found a negative association between agreeableness, conscientiousness, and extraversion on the one hand and liquid savings on the other. They also found that openness to experience was negatively associated with liquid savings for some but not for other groups. Brown and Taylor[88] found that conscientiousness positively predicted savings and negatively predicted debts. Donnelly et al.[89] found a negative association between extraversion and debt. Higher levels of conscientiousness, higher levels of emotional stability, and lower levels of extraversion make it more likely to pursue a healthy lifestyle and financially responsible behavior simultaneously[90]. Emotional stability and conscientiousness are negatively associated with financial stress[5]. To measure Goldberg's Big Five personality traits[81]: openness to experience, conscientiousness, agreeableness, extraversion, and emotional stability (α = .78, .78, .81, .88, and .89, respectively). We included nine control variables (gender, age, education level, household size, openness to experience, conscientiousness, agreeableness, extraversion, and emotional stability) in our models.

Multiple regression

To examine the contribution of different aspects of one's economic situation in predicting financial stress, we performed a multiple regression analysis with income, savings, debts, income volatility, and employment as predictors and financial stress as independent variables. Our model included the interactions between income and other economic predictors (savings, debts, income volatility, and employment). The demographic variables age, education level, household size, and the personality traits openness to experience, conscientiousness, agreeableness, extraversion, and emotional stability served as control variables. Following Friedrich's[91] and Aiken's[92] guidance, we standardized the numerical variables before calculating the interaction terms: For each observation, we subtracted the mean and divided the result by the standard deviation. As a result, the regressions gave us standardized coefficients, enabling us to compare the relative contributions of each independent variable to predicting financial stress.

The data set presented us with two challenges. First, an inspection of diagnostics from the OLS regression showed that they contained a considerable proportion of influential observations (see Appendix, Tables A1 and A2, Figure A1). Second, as indicated above, many observations had missing data on one or more variables. We addressed the challenges by performing multiple imputations and choosing a robust regression method for influential observations. We found no multicollinearity between the independent variables in our model (see Appendix, Tables A3 and A4).

Multiple imputation

Deleting observations with missing values on one or more variables would leave 49% of the data unused, resulting in inflated standard errors[93]. The preferred methods for dealing with missing data fall into two broad groups: maximum likelihood estimation and multiple imputation[93]. Maximum likelihood estimation has the disadvantage of requiring the estimation of a model for the joint distribution of all the variables, and results may not be robust to model choice. A downside of multiple imputation is that the imputation model must be congenial with the analysis. In the case of our study, the assumption is that the imputation model poses a lighter restriction than the assumption of a joint (normal) distribution of all variables. We, therefore, chose to proceed with multiple imputation. We used multiple imputation to address missing values. We applied multivariate imputation by chained equations (*mice*) because, unlike other available techniques, this method does not require a joint distribution of all the variables in the model[95]. We used Van Buuren and Groothuis-Oudhoorn's[96] *mice* package in R, which iteratively imputes values for all variables with missing data and uses the imputed values to estimate a posterior distribution for the model parameters. The mechanism randomly draws parameters to generate predictions. It uses these predictions to impute values in the next iteration. To increase the plausibility of missingness at random, we included the control variables (gender, age, education level, household size, and personality traits) in the imputation process[95]. We used *mice* combined with a random forest mechanism, a prediction method from machine learning constructed by recursively partitioning a data set and fitting a simple model to each partition[97]. Random forests can retain interactions between variables with missing values and are, therefore, well suited for our model and reduce the possibility of erroneous results[95,98].

The fraction of missing information, *lambda*, represents the proportion of the total variance in the parameter estimates due to missingness[99]. *Lambda* can be calculated as $(1+m) * VB / VT$, where m is the number of imputed datasets, and VB and VT are the between and total variance, respectively. A test run with

20 imputations resulted in a maximum *lambda* of .64. Based on Von Hippel's guidance[100], we set the number of imputations at 93, corresponding with *lambda* = .05. We, therefore, created 93 imputed data sets, each representing a plausible completion of the missing values. These 93 imputed data sets gave us 93 different versions of the complete data, accounting for uncertainty in the missing data.

Robust regression

It is well established that ordinary least squares (OLS) estimation can give highly unreliable outcomes in the presence of influential observations. OLS minimizes the sum of the squared residuals, which gives "unusual" observations an unduly large weight. Because our data contained many outliers and heavy tails, we applied the MM-estimator developed by Yohai[101], which goes through three stages to estimate a regression model. The first stage uses an S-estimator to minimize the percentage bend midvariance of the residuals. The percentage bend midvariance is less sensitive to outliers than the variance; it gives robust but not necessarily efficient estimates. The second stage calculates an M-estimate of the errors. The third stage computes M-estimates of the regression parameters based on the outcomes of the first two stages. This process gives regression estimates that compare well with other estimators in terms of robustness while maintaining efficiency[102,103]. We used the *lmrob* function in the R-package *robustbase* to perform the calculations, with parameters proposed by Koller and Stahel[104].

We performed robust regression for each imputed dataset, resulting in 93 regression analyses. Next, we applied Rubin's rules[105] to pool the results of these individual regressions. We averaged the estimates of the 93 individual regressions to obtain the parameter estimates. The pooled standard errors are derived from two distinct components: the within imputation variance and the between imputation variance. Within imputation variance represents the precision of the parameter of interest within each imputed dataset.

On the other hand, between imputation variance reflects the additional variance arising due to missing data. It is estimated by considering the variance of the parameter of interest across all imputed datasets. The pooled standard errors are calculated as the square root of the sum of the within-imputation variance and the between-imputation variance.

RESULTS

Descriptive statistics and correlations

Of the 1,114 respondents, 55% were female (see Table 1). Their ages were between 18 and 92 (*M* = 53.26 years, *SD* = 17.78). Their mean net monthly income was 2,800 euros (*Median* = 2,258, *SD* = 7,226). Inspection revealed considerable numbers of outliers, skewness, and heavy tails (Appendix, Tables A1 and A2, and Figure A1). We also observed a relatively large proportion of missing data for some variables, with a maximum of 41% missing values for savings. Although the total percentage of missing values was moderate (9%), 550 (49%) respondents had missing values on at least one variable.

We calculated Spearman's correlations between the continuous variables in our model and point-biserial correlations for dichotomous variables (Appendix Table A5). Financial stress moderately correlated with buffer savings (r_{PB} = -.37) and income (r_S = -.30). The negative signs indicated that insufficient savings and lower incomes were associated with more financial stress. The number of debts (r_S = .25) and employment (r_{PB} = -.18) weakly correlated with financial stress. More debts and unemployment were associated with more financial stress. We found a very weak correlation between income volatility (r_S = .05) and financial stress. Of the control variables, age (r_S = -.17), conscientiousness (r_S = -.20), and emotional stability (r_S = -.20) had weak negative correlations with financial stress. The other control variables had very weak or no correlation with financial stress. We found that income correlated weakly with buffer (r_{PB} = -.26) and employment (r_{PB} = .17) and very weakly with number of debts (r_S = -.06) and income volatility (r_S = .08).

Main analysis

We ran the robust MM-regression analyses for the 93 imputed data sets in three steps. First, we specified a model with only the economic predictors: income, savings, debts, income volatility, and employment (Model 1). Next, we added the control variables: the five personality traits, education level, age, gender, and household size (Model 2). Finally, we added the interactions of income with the other economic predictors (Model 3). Table 4 contains the results for the three models.

Results from Model 1 (R^2 = .29) showed that income, buffer savings, number of debts, and employment predicted financial stress. In all cases, signs of the associations were as expected, indicating that lower income, insufficient buffer savings, more debts, and unemployment were associated with more financial stress. We found no support for income volatility being a predictor of financial stress. A comparison of

the standardized regression parameters shows that buffer savings had the largest relative contribution to explaining financial stress (β = 0.709, $p < .001$), followed by employment (β = -0.506, $p < .001$), number of debts (β = 0.238, $p < .001$), and income (β = -0.154, $p < .001$). We used the *pool.compare* function that is part of the R *mice* package to compare model fits. This function is based on the method proposed by Meng and Rubin[105] and uses an adapted version of the Wald statistic (W). The fit for Model 2 ($R^2 = .34$) was significantly higher compared to Model 1 ($W = 4.90$, $p < .001$). The conclusions did not change compared to Model 1. From both models, therefore, we conclude that sufficient buffer savings, employment, and number of debts had stronger associations with financial stress than income.

The fit for Model 3 ($R^2 = .36$) was significantly higher compared to Model 2 ($W = 2.97$, $p = .019$). In this model, the relative contribution of buffer savings and income was comparable (β = -0.653, $p < .001$ and β = -0.612, $p < .001$, respectively). The number of debts had a smaller but significant contribution to predicting financial stress (β = 0.224, $p < .001$). On average, the results did not show employment to contribute to financial stress (β = -0.230, $p = .097$). However, we did find an interaction between income and employment. We estimated the marginal effects of different income levels, from two standard deviations below the mean to two standard deviations above the mean (Appendix, Table A6). Results showed a negative association between employment and financial stress for an income level two standard deviations below the mean (β = -0.895, $p = .006$); for all other income levels, results did not show an association between employment and financial stress. We found no significant interaction between income on the one hand and buffer and the number of debts on the other. This finding indicates that having sufficient buffer savings and having fewer debts was associated with less financial stress, independent of household income.

The control variables education level, age, gender, and household size were significant covariates, whereas psychological traits were not. In line with previous findings, age and education level had a negative association with financial stress. Other things being equal, males experienced more financial stress than females, contrasting with earlier findings. Household size was negatively associated with financial stress.

Additional analyses

We tested how our model performed compared to a model with only income as an independent variable. Moreover, we tested our findings' robustness to how financial stress, savings, debts, and income volatility were operationalized (see Appendix). Also, we examined how economic predictors were associated with the four different subscales of financial stress.

*Table 4. Results of the pooled robust regressions for the base model (including only the predictor variables, Model 1), the model with control variables (Model 2), and the model with control variables and interactions (Model 3). For each model, the standardized regression parameters (β), standard errors (σ), t-statistic (t), and p-value (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

	Model 1: Base (R^2 = .29)				
	β	**σ**	***t***	***p***	
Intercept	0.915	0.112	8.206	< .001	***
Income	-0.154	0.026	-5.858	< .001	***
Buffer	-0.709	0.077	-9.216	< .001	***
Number of debts	0.238	0.029	8.332	< .001	***
Income volatility	0.010	0.025	0.394	.694	
Employed	-0.506	0.104	-4.852	< .001	***
Openness to experience					
Conscientiousness					
Agreeableness					
Emotional stability					
Extraversion					
Education level 1					
Education level 2					
Education level 3					
Education level 4					
Education level 5					
Age					
Gender					
Household size					
Income * savings					
Income * debt amount					
Income * income volatility					
Income * employed					

Results from the model with only income as an independent variable showed that income predicted financial stress (β = -0.219, $p < .001$, see Table A7), but explanatory power was much lower compared to the model that included buffer savings, debts, income volatility, and employment (R^2 = .06 and .29, respectively). A model with the logarithm of financial stress (R^2 = .33) showed similar results as the main model: Buffer had the largest standardized coefficient (β = -0.704, $p < .001$), followed by income (β = -0.542, p = .003)

Model 2: Control variables (R^2 = .34)					Model 3: Control variables + interactions (R^2 = .35)				
β	σ	*t*	*p*		β	σ	*t*	*p*	
1.236	0.150	8.254	< .001	***	0.962	0.185	5.204	< .001	***
-0.150	0.028	-5.367	< .001	***	-0.612	0.168	-3.636	< .001	***
-0.682	0.076	-8.920	< .001	***	-0.653	0.077	-8.476	< .001	***
0.232	0.028	8.190	< .001	***	0.224	0.030	7.572	< .001	***
-0.018	0.025	-0.700	0.484		-0.013	0.025	-0.511	.609	
-0.431	0.103	-4.202	< .001	***	-0.230	0.138	-1.663	.097	.
0.045	0.035	1.264	.208		0.045	0.035	1.267	.207	
-0.064	0.036	-1.796	.074	.	-0.063	0.035	-1.773	.078	
-0.018	0.035	-0.502	.616		-0.018	0.035	-0.503	.615	
-0.051	0.037	-1.384	.168		-0.051	0.037	-1.397	.164	
0.025	0.035	0.708	.48		0.024	0.035	0.666	.506	
-0.377	0.121	-3.123	.002	**	-0.345	0.122	-2.836	.005	**
-0.385	0.130	-2.951	.003	**	-0.340	0.131	-2.588	.01	**
-0.290	0.120	-2.424	.016	*	-0.264	0.120	-2.191	.029	*
-0.370	0.120	-3.098	.002	**	-0.339	0.120	-2.814	.005	**
-0.345	0.132	-2.605	.009	**	-0.309	0.133	-2.320	.021	*
-0.127	0.028	-4.515	< .001	***	-0.120	0.028	-4.286	< .001	***
-0.137	0.055	-2.503	.013	*	-0.125	0.054	-2.311	.021	*
-0.056	0.026	-2.155	.031	*	-0.052	0.026	-2.000	.046	*
					0.127	0.076	1.666	.097	.
					-0.009	0.034	-0.258	.797	
					0.051	0.026	1.959	.05	.
					0.370	0.162	2.288	.023	*

and debts (β = 0.199, $p < .001$) (see Table A8). In contrast to the main model, employment was not a predictor in the model, with the logarithm of financial stress as the dependent variable.

Next, we repeated the main analysis with different operationalizations of some independent variables. First, we estimated a model with the amount of liquid savings instead of buffer as an independent variable (Table A9, R^2 = .29). Results

showed that savings were a significant predictor of financial stress in this model (β = -0.199, $p < .001$). In this case, we did find a significant interaction between income and savings (β = 0.092, $p = .002$). The interaction's positive sign indicates that the negative association between financial stress and income was weaker as income increased. Put differently, there was a stronger negative association between financial stress and savings when income was lower. This finding was in line with our hypotheses. Second, we replaced the number of debts with two alternative operationalizations of debt: total debt amount (Table A10, $R^2 = .30$) and debt-to-income ratio (Table A11, $R^2 = .30$). In both cases, results showed that debts did not significantly predict financial stress (β = 0.047, $p = .080$ and β = 0.054, $p = .083$). Third, replacing the number of adverse income shocks with the relative size of negative income shocks (Table A12, $R^2 = .35$) did not change the results; we found no support for an association between income volatility and financial stress (β = 0.002, $p = .946$). However, the results did show that income positively moderated the association between employment and financial stress (β = 0.414, $p = .014$). There was a negative association between employment and financial stress for lower-income households (income one standard deviation below the mean). The robustness check largely confirmed our main analysis: Savings and income consistently predicted financial stress. For debts, the picture was more complex. The number of debts predicted financial stress, whereas debt amount and debt-to-income ratio did not.

Finally, we explored how the five aspects of one's economic situation predicted each of the four aspects of financial stress (the appraisal of money shortage and lack of control, financial worries and rumination, and short-term focus, Table A13). The first three aspects of financial stress (appraisal of money shortage, lack of control, and financial worries and rumination) were consistently predicted by income, buffer, and debts ($R^2 = .34$, .29, and .27, respectively). The relative contributions of the independent variables differed. For the appraisal of money shortage, income had the highest standardized coefficient (β = -0.628, $p < .001$), followed by buffer (β = -0. 598, $p < .001$) and debts (β = 0.218, $p < .001$ and β = 0.145, $p < .001$). For lack of control and financial worries and rumination, buffer had the highest standardized coefficient (β = -0.695, $p < .001$ and β = -0.619, $p < .001$, respectively), followed by income (β = -0.578, $p < .001$ and β = -0.376, $p < .001$, respectively) and debts (β = 0.223, $p < .001$ and β = 0.111, $p < .001$, respectively). Income moderated the association between buffer and the independent variable for money shortage (β = 0.202, $p = .007$) and financial worries and rumination (β = 0.160, $p = .004$), but not for lack of control (β = 0.054, $p = .498$). Income moderated the association between employment and the independent variable

for money shortage (β = 0.342, p = .026) but not for lack of control (β = 0.232, p < .158) and financial worries and rumination (β = 0.302, p = .063). The fourth aspect of financial stress (short-term focus) was only predicted by the number of debts (β = -0.305, p = .006). The short-term focus model had considerably less explanatory power (R^2 = .05) than the other models. Income moderated the association between employment and short-term focus (β = 0.548, p = .039).

DISCUSSION

The present research examined the relationship between households' economic situation and financial stress. We took an integrative perspective of households' economic situation by including five aspects: (adjusted) income, savings, debts, income volatility, and employment. We hypothesized that - besides income - savings, debts, income volatility, and employment contribute to predicting financial stress. We also hypothesized that these associations are stronger as income decreased. We tested our hypotheses with a probability sample of the Dutch population (N = 1,114). We adjusted net monthly income for household size to account for larger households having more expenses. The data partially supported the hypothesized relations. Results confirmed that adjusted income, buffer savings, and the number of debts predicted financial stress. Lower income, insufficient buffer savings, and more debts were associated with more financial stress. We found that employment only predicted financial stress for the lowest end of the income spectrum. The results did not support the hypotheses that income volatility and debt amounts predict financial stress.

Income. We found adjusted income to be a predictor of financial stress. This finding aligns with previous research indicating that lower-income households are more likely to experience fewer resources than they feel they need. This appraisal may cause them to worry and ruminate, feel less in control, and focus more on the present, all aspects of financial stress. We observed that adjusted income correlated strongly with all four components of financial stress (money shortage, lack of control, financial worries and rumination, and short-term focus). Future studies might incorporate discretionary income, defined as net income minus fixed expenses, as a predictor. Disposable income may have a stronger correlation with financial stress because it considers the amount of "slack" households experience[1].

Savings. We found that insufficient buffer savings was associated with more financial stress. This finding was expected; households can use buffer savings to overcome unexpected expenditures and income shocks. Also, households with savings in the bank need to worry less about making ends meet until the next paycheck. We did not find income to moderate the association between buffer savings and financial stress. This finding suggests a buffer is essential for lower- and higher-income households to prevent financial stress. A model with savings amount instead of buffer showed that savings amount also predicted financial stress. In this case, we did find income to be a moderator of the association

between savings and financial stress. A potential explanation for this finding is that higher-income households often have higher fixed expenditures, requiring a higher buffer. Income shocks and unexpected expenditures are also likely to increase as income increases.

Debts. We found that the number of debts predicted financial stress. This finding confirms that the number of debt accounts impacts psychological outcomes more than debt amounts per se[68–70]. We did not find support for income moderating the association between the number of debts and financial stress, suggesting that a higher number of debts is stressful regardless of income level. We found no support for an association between debt amounts and financial stress. These results indicated a complex relationship between debt and financial stress. A post hoc explanation for the absence of an association between total debt amount and financial stress could be that higher debts may not necessarily increase financial stress as long as one can pay the interest and repayment (measures not available in the current data). Future studies could incorporate interest payments and redemption in their analyses to address this possibility. Also, future research could examine how different types of debts affect financial stress. Most studies focused on one type of debt (particularly credit card debt). Few studies have examined the distinctive influence of different kinds of debt on stress or mental health, and their findings are inconclusive. In a review of the literature on the health effects of indebtedness, Turunen and Miilamo[107], for example, found that "The source of debt had little effect on the prevalence of common mental disorders, though some types of debt were reported more often than others among people with a mental disorder" (p. 6). Other studies have found that different types of debts had different associations with financial burdens[65,67].

Income Volatility. In contrast to previous findings[57], we found no support for an association between income volatility and financial stress for two different measures of income volatility. Our data did not enable us to distinguish anticipated income changes - such as the receipt of employee holiday allowances or regular volatility of turnover for entrepreneurs - from unanticipated income changes - such as the loss of income due to sickness or becoming unemployed. The specifics of the income volatility may determine the strength of its association with financial stress; predictable income shocks may have a weaker association with financial stress than unpredictable income shocks. There is ample evidence that unforeseen life events are associated with stress and mental well-being[24,108]. Future studies could examine if different types of income shocks have different associations with financial stress.

Employment. We found that employment only predicted financial stress for the lowest-income groups. This result partly corroborates earlier studies that have found negative associations between unemployment and psychological well-being[49,50]. Being unemployed may be associated with insecurity and worrying about being able to pay the bills and provide for one's family, only for lower-income households.

Strengths and limitations

We examined how five aspects of one's economic situation (income, savings, debts, income volatility, and employment) predicted financial stress in one empirical model. We assessed the relative contribution of each aspect to predicting financial stress. We also examined if income moderated the association of financial stress with the other four aspects of one's economic situation. To our knowledge, our study is the first to examine these aspects in predicting financial stress. This approach allowed the examination of the relative contributions of economic factors in predicting financial stress. We studied the relationships of economic correlates with financial stress using different operationalizations of the predictor variables, enabling us to test our findings' robustness. Also, we used state-of-the-art multiple imputation methods to deal with missing data and robust estimation techniques to overcome influential observations. This further enhanced our confidence in the results.

Our study focused on the economic predictors of financial stress. We included several demographic variables (age, gender, education level, and household size) and psychological traits as control variables. However, other factors may contribute to financial stress, such as financial literacy, financial attitudes, and self-efficacy[108,109]. It would be worthwhile to examine how these factors, in combination with economic factors, predict financial stress.

Because we used cross-sectional data, one evident limitation of the current study is that we could not draw causal inferences. Experiments or quasi-experimental longitudinal studies could increase confidence in causal relationships. Experiments require developing paradigms to manipulate income, savings, debts, and income volatility in a laboratory environment. As an alternative, longitudinal studies may provide a viable route. A second limitation is that we used self-reported economic data. Future research could include administrative data instead.

Financial stress is relevant in a developed country such as the Netherlands because financial stress can have profound consequences for people's well-being, health, cognitive performance, and behavior. It is, therefore, important to

understand the association between households' objective economic situation and subjective financial stress in the Dutch context. Future studies could examine the associations between economic factors and financial stress in other economic and cultural contexts.

Our findings also provide some suggestions for (additional) conceptualizations of several aspects of households' economic situation when studying their association with stress and well-being. Discretionary income may be a stronger predictor of financial stress than net income. Likewise, future studies could look at the effects of interest and repayment of debts in addition to the debt amount. Finally, future studies could use a more fine-grained distinction between different types of (un)employment, such as being unemployed, working for an employer, being self-employed, and being retired.

Implications for research and policy

This study's central message is that income is too narrow to conceptualize one's economic situation to predict financial stress. Other indicators, like savings, (number of) debts, and employment, should also be part of the equation. Also, we encourage examining the impact of different types of debts on financial stress. Furthermore, future studies should be aware that the association between savings and employment status, on the one hand, and financial stress, on the other, may be stronger as income decreases. We also suggest examining whether unexpected income shocks resulting from life events - as opposed to monthly income volatility - predict financial stress.

Furthermore, we encourage examining the associations between economic variables and financial stress in other countries. Finally, examining if there is a temporal association between one's current economic situation and future financial stress is worthwhile, especially in the aftermath of COVID-19.

In policy, it is vital to consider that financial stress and its potential cognitive, affective, and behavioral consequences are not limited to lower-income households. Having a low income is an important source of financial stress. However, including other economic aspects than income, such as the availability of rainy-day savings, the number of different debts, and employment status in social policy design, can provide a sharper picture of the target audience. This enables better tailoring of interventions to specific (sub)groups. Our research provides potential avenues for interventions to counter financial stress.

Providing income support to low-income households security is an important way to counter financial stress. Social welfare systems aim to provide a basic standard of living[111]. The effectiveness of social welfare systems relies on eligible households participating[112]. Many households do not take up the social welfare for which they are eligible[113,114]. Effective ways to promote welfare participation include providing personalized information to eligible households[115–117], decreasing the complexity of application procedures[118–120], and engaging in active outreach and assistance[121,122]. Behaviorally informed interventions or "nudges" have had limited effects[123–125].

Ensuring that households have a financial buffer by promoting rainy-day savings may be another effective way to reduce financial stress. Previous studies have found that effective ways to promote buffer savings include automatically enrolling workers into an employer-sponsored savings account funded by payroll deduction[126], commitment accounts with withdrawal restrictions[127], promoting savings habits[128], stimulating them to think about their savings goal[129], sending reminders to make deposits, prompting to save a portion of their tax return[130], and prize-linked saving, which offers lottery-like payouts to instead of interest[131].

Promoting savings can also reduce the need for debt[132]. Our research suggests that consolidating multiple small debts into one larger debt may reduce financial stress. This is in line with previous findings from a debt relief program in Singapore. Waiving multiple debts positively affected cognitive performance, including short-term focus, rather than waiving a single large debt[69]. Another study suggests that paying off the smallest debt first and then paying off the rest of their debts from smallest to largest may be beneficial despite being economically suboptimal[133].

To conclude, the present research took a more integrative approach to predicting the psychological construct of financial stress than previous studies. The results showed that buffer savings, number of debts, and employment also contributed to predicting financial stress. Taking a more holistic view of households' economic situation opens new routes for future research. It also provides opportunities for developing policy interventions to reduce financial stress and increase financial well-being.

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CHAPTER 3. APPENDIX
DIAGNOSTICS

*Table A1. Outliers, normality test, skewness, and kurtosis of the continuous variables. We calculated the number of outliers as proposed by D'Orazio (2020). For the variables without a clear skewness (i.e., the control variables), the outlying observations are those outside the interval [Q_1 - k*IQR; Q_1 + k*IQR], where Q_1 and Q_3 are respectively the 1st and the 3rd quartile, while* IQR = (Q_3 - Q_1) *is the Inter-Quartile Range. We used the value* k *= 1.5. For variables with strong skewness (i.e., the independent and dependent variables), the outlying observations were identified using the method proposed by Hubert and Vandervieren (2008) and based on the Medcouple measure of skewness; in practice, the bounds are[Q_1 - 1.5exp(aM)IQR; Q_3 + 1.5exp(bM)IQR], where* M *is the medcouple; when* M *> 0 (positive skewness) then* a *= -4 and* b *= 3; for negative skewness (*M *< 0),* a *= -3 and* b *= 4.*

Variable	Outliers	Shapiro-Wilk	p-value	Skewness	Kurtosis
Financial stress	0	.820	< .001	1.415	4.658
Income	31	.960	< .001	0.937	5.022
Debts	110	.330	< .001	5.082	44.039
Income fluctuation	193	.450	< .001	3.460	21.319
Age	0	.970	< .001	-0.166	2.028
Household size	0	.840	< .001	1.050	3.933
Openness	5	.980	.214	-0.055	2.644
Conscientiousness	2	.980	.129	-0.337	3.500
Agreeableness	2	.970	.041	-0.515	2.947
Extraversion	0	.980	.232	-0.290	2.938
Emotional stability	4	.990	.311	-0.155	2.768

Table A2. Influential Observations. Number of influential observations for different measures of influential observations: DFFIT, COVRATIO, Cook's distance

Test	#
DFFIT	31
COVRATIO	77
Cook's d	3

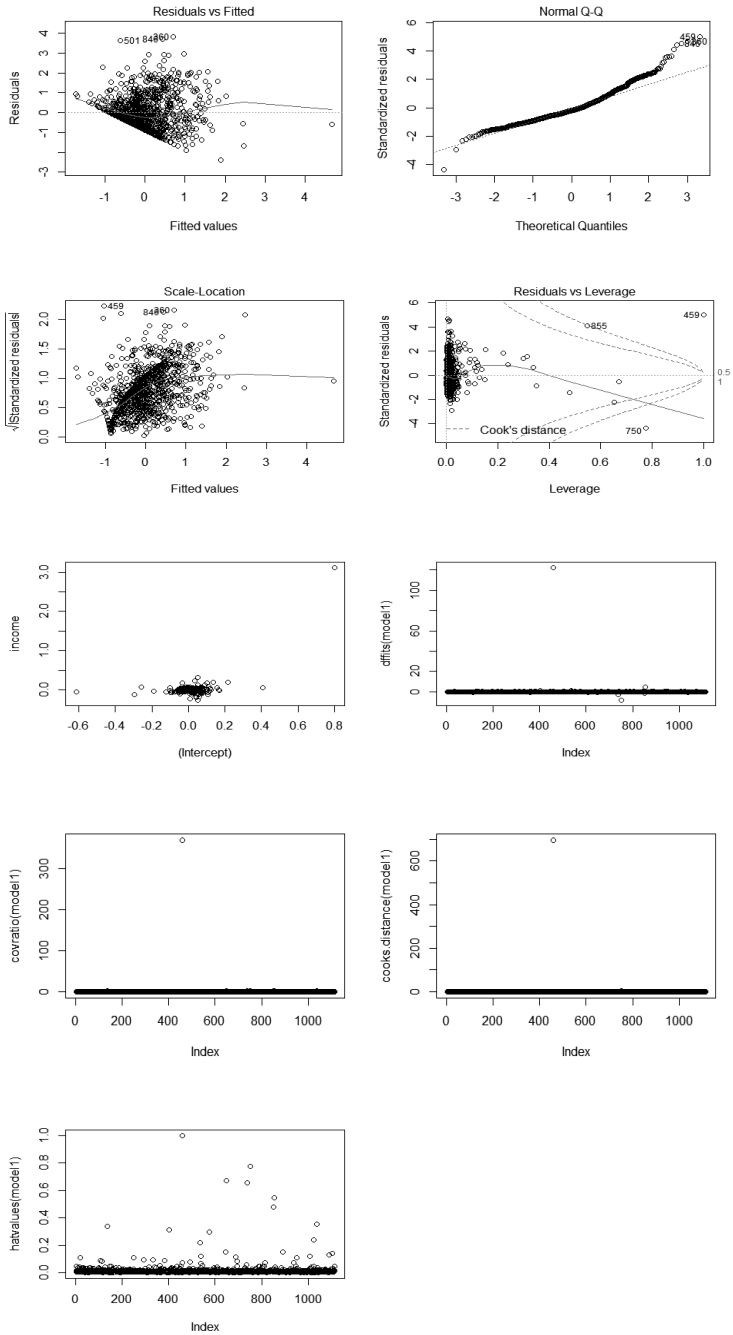

Figure A1. Influential observations. DFBETAS for each model variable, DFFITS, covariance ratios, Cook's distances, and the diagonal elements of the hat matrix. It is safe to say that the model has a considerable number of influential observations.

MULTICOLLINEARITY

Table A3. Multicollinearity Tests. Cooley and Lohnes' Determinant of the correlation matrix, Farrar's test of chi-square for the presence of multicollinearity, Kovacs et al.s' Red Indicator, Chatterjee and Price's Sum of lambda inverse, Theil's indicator and Belsey's condition number (Imdad et al., 2019; Imdad & Aslam, 2020; Imdadullah et al., 2016).

Test	Result
Determinant |X'X|	0.47
Farrar Chi-Square	827.48
Red Indicator	0.12
Sum of Lambda Inverse	11.69
Theil's Method	-1.30
Condition Number	2.00

Table A4. Variance Inflation Factors (VIF) for Model 2 (independent variables + control variables). We took the results of the regression for the first imputed dataset.

Variable	VIF
Income	1.24
Buffer	1.10
Number of debts	1.06
Income volatility	1.03
Employed	1.05
Openness	1.07
Conscientiousness	1.05
Agreeableness	1.16
Extraversion	1.03
Emotional stability	1.05
Extraversion	1.03
Education	1.44
Age	1.30
Gender	1.15
Household size	1.13

CORRELATIONS

Table A5. Correlation coefficients between our main model's continuous and dichotomous variables. When at least one dichotomous variable (buffer, gender, or employed) is involved, the point-biserial point correlation r_{PB} is used. For pairs of continuous variables, Spearman´s correlation r_S is used. Moderate correlations are ***bold and underlined****; weak correlations are* *underlined*; *very weak or no correlations are displayed in normal font. Following Dancey and Reidy's (2007) guidance, we used the following cut-off points: |r| = 1 indicates perfect correlation; .6 ≤ |r| < 1: strong correlation; .3 ≤ |r| < .6: moderate correlation; .1 ≤ |r| < .3: weak correlation; |r|< .1: no or very weak correlation.*

	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Financial Stress	**-.31**	**-.37**	.25	.05	-.18	-.02	-.17	-.03	-.20	-.20	.08	-.09	.02
2. Income		.26	-.06	.08	.19	-.12	-.02	.14	.11	.12	-.06	-.07	.22
3. Buffer			-.21	-.03	.14	-.11	.08	-.09	.12	.09	.14	-.16	.05
4. Number of debts				.08	-.04	.01	-.11	.03	-.07	-.08	.05	-.10	-.11
5. Income volatility					.01	-.05	-.12	.01	-.04	-.05	.08	-.08	.10
6. Employed						.02	.06	.04	.10	.21	.01	.05	-.03
7. Gender							-.07	-.04	.16	-.14	-.07	.45	-.03
8. Age								-.27	.06	.23	-.11	.02	-.07
9. Household Size									.05	-.03	-.14	.15	-.12
10. Conscientiousness										.21	-.05	.24	.23
11. Emotional Stability											-.14	.08	.13
12. Extraversion												-.21	-.12
13. Agreeableness													.20
14. Openness													

REGRESSIONS

*Table A6. Marginal effects at various levels of income for the other independent variables. The income column contains the number of standard deviations away from the mean (-2, -1, 0, 1, or 2). The standardized regression parameters (β), standard errors (σ), t-statistics (t), and p-values (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

	Income	**β**	**σ**	***df***	***p***	
Buffer	-2	-0.878	0.167	317.140	< .001	***
Buffer	-1	-0.661	0.194	154.805	< .001	***
Buffer	0	-0.625	0.121	218.656	< .001	***
Buffer	1	-0.547	0.146	254.809	< .001	***
Buffer	2	-0.690	0.217	136.847	.002	**
Debts	-2	0.240	0.063	1,338.086	< .001	***
Debts	-1	0.225	0.054	1,277.340	< .001	***
Debts	0	0.220	0.040	1,396.308	< .001	***
Debts	1	0.218	0.052	1,913.095	< .001	***
Debts	2	0.223	0.052	1,534.532	< .001	***
Employed	-2	-0.895	0.321	268.139	.006	**
Employed	-1	-0.250	0.525	126.591	.635	
Employed	0	-0.142	0.312	174.282	.648	
Employed	1	0.065	0.398	200.864	.870	
Employed	2	-0.339	0.539	122.333	.531	
Income fluctuation	-2	-0.104	0.063	1,014.287	.097	.
Income fluctuation	-1	-0.016	0.079	163.939	.841	
Income fluctuation	0	-0.001	0.044	279.047	.979	
Income fluctuation	1	0.028	0.055	287.804	.619	
Income fluctuation	2	-0.030	0.077	170.050	.701	

*Table A7. Results of the pooled robust regressions for the model with only income as an independent variable. The standardized regression parameters (β), standard errors (σ), t-statistics (t), and p-values (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

	β	**σ**	***t***	***df***	***p***	
Intercept	-0.139	0.025	-5.594	1,107.681	< .001	***
Income	-0.219	0.026	-8.461	963.510	< .001	***

*Table A8. Results of the pooled robust regressions for the model with log(pifs) as the dependent variable. The standardized regression parameters (β), standard errors (σ), t-statistics (t), and p-values (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

	β	**σ**	***t***	***df***	***p***	
Intercept	1.040	0.207	5.018	554.761	< .001	***
Income	-0.542	0.184	-2.950	450.399	.003	**
Buffer	-0.704	0.087	-8.104	269.797	< .001	***
Debts	0.199	0.033	6.090	692.428	< .001	***
Income fluctuation	0.004	0.028	0.150	868.450	.881	
Employed	-0.203	0.157	-1.297	603.396	.195	
Openness	0.053	0.041	1.295	191.797	.197	
Conscientiousness	-0.072	0.041	-1.753	180.482	.081	.
Agreeableness	-0.024	0.040	-0.600	205.658	.549	
Emotional stability	-0.064	0.043	-1.500	161.871	.136	
Extraversion	0.019	0.042	0.463	165.384	.644	
Education level 1	-0.327	0.136	-2.411	821.562	.016	*
Education level 2	-0.341	0.146	-2.329	865.203	0.02	*
Education level 3	-0.252	0.134	-1.881	821.878	0.06	.
Education level 4	-0.339	0.135	-2.517	830.635	.012	*
Education level 5	-0.307	0.149	-2.060	835.518	0.04	*
Age	-0.142	0.032	-4.463	836.178	< .001	***
Gender	-0.143	0.062	-2.308	706.259	.021	*
Household size	-0.045	0.030	-1.523	880.937	.128	
Income * buffer	0.066	0.083	0.794	342.703	.427	
Income * debts	0.034	0.038	0.890	520.569	.374	
Income * income volatility	0.050	0.030	1.669	954.141	.096	.
Income * employed	0.311	0.177	1.760	501.999	.079	.

*Table A9. Results of the pooled robust regressions for the model with savings amount instead of buffer as an independent variable. The standardized regression parameters (β), standard errors (σ), t-statistics (t), and p-values (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

	β	**σ**	***t***	***df***	***p***	
Intercept	0.571	0.178	3.203	641.116	.001	**
Income	-0.587	0.163	-3.601	414.958	< .001	***
Savings	-0.199	0.042	-4.750	316.924	< .001	***
Debts	0.260	0.030	8.563	668.440	< .001	***
Income fluctuation	-0.013	0.025	-0.527	996.123	.598	
Employed	-0.286	0.141	-2.030	565.918	.043	*
Openness	0.051	0.036	1.415	196.834	.159	
Conscientiousness	-0.081	0.037	-2.171	175.772	.031	*
Agreeableness	-0.025	0.036	-0.680	205.626	.497	
Emotional stability	-0.059	0.039	-1.528	158.193	.129	
Extraversion	0.024	0.037	0.654	165.881	.514	
Education level 1	-0.429	0.120	-3.575	917.396	< .001	***
Education level 2	-0.425	0.130	-3.257	918.958	.001	**
Education level 3	-0.343	0.120	-2.857	869.772	.004	**
Education level 4	-0.436	0.119	-3.653	906.181	< .001	***
Education level 5	-0.416	0.133	-3.135	884.860	.002	**
Age	-0.102	0.028	-3.597	922.440	< .001	***
Gender	-0.101	0.055	-1.831	719.593	.067	.
Household size	-0.036	0.026	-1.355	948.807	.176	
Income * savings	0.092	0.029	3.119	321.997	.002	**
Income * debts	-0.031	0.034	-0.911	548.025	.363	
Income * income volatility	0.054	0.027	2.041	964.537	.042	*
Income * employed	0.436	0.165	2.646	422.985	.008	**

*Table A10. Results of the pooled robust regressions for the model with debt amount instead of number of debts as an independent variable. The standardized regression parameters (β), standard errors (σ), t-statistics (t), and p-values (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

	β	**σ**	***t***	***df***	***p***	
Intercept	0.923	0.192	4.818	447.383	< .001	***
Income	-0.688	0.173	-3.976	334.011	< .001	***
Buffer	-0.695	0.077	-8.981	261.117	< .001	***
Debt amount	0.047	0.027	1.753	557.630	.080	.
Income fluctuation	-0.008	0.025	-0.315	841.743	.753	
Employed	-0.224	0.143	-1.559	487.299	.120	
Openness	0.040	0.036	1.104	189.347	.271	
Conscientiousness	-0.064	0.036	-1.774	181.117	.078	
Agreeableness	-0.024	0.035	-0.680	222.063	.497	
Extraversion	0.023	0.037	0.641	170.031	.522	
Emotional stability	-0.055	0.037	-1.477	170.631	.141	
Education level 1	-0.311	0.125	-2.489	703.386	.013	*
Education level 2	-0.306	0.135	-2.262	714.033	.024	*
Education level 3	-0.217	0.124	-1.753	690.543	.080	.
Education level 4	-0.281	0.124	-2.268	710.863	.024	*
Education level 5	-0.256	0.136	-1.881	729.880	.060	.
Age	-0.125	0.029	-4.374	786.081	< .001	***
Gender	-0.113	0.055	-2.051	688.246	.041	*
Household size	-0.055	0.027	-2.040	840.221	.042	*
Income * buffer	0.148	0.075	1.963	302.134	.051	.
Income * debt amount	-0.010	0.036	-0.271	425.543	.786	
Income * income volatility	0.041	0.026	1.533	918.759	.126	
Income * employed	0.423	0.166	2.541	372.191	.011	*

*Table A11. Results of the pooled robust regressions for the model with debt-to-income ratio amount instead of number of debts as an independent variable. The standardized regression parameters (β), standard errors (σ), t-statistics (t), and p-values (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

	β	**σ**	***t***	***df***	***p***	
Intercept	0.926	0.192	4.837	447.616	< .001	***
Income	-0.678	0.175	-3.874	324.999	< .001	***
Buffer	-0.695	0.077	-8.980	261.601	< .001	***
Debt-to-Income	0.054	0.031	1.738	613.191	.083	.
Income fluctuation	-0.010	0.026	-0.370	789.748	.712	
Employed	-0.225	0.143	-1.579	497.803	.115	
Openness	0.040	0.036	1.107	189.602	.270	
Conscientiousness	-0.064	0.036	-1.778	181.907	.077	.
Agreeableness	-0.024	0.035	-0.676	223.269	.500	
Emotional stability	-0.055	0.037	-1.475	170.696	.142	
Extraversion	0.024	0.037	0.641	168.659	.522	
Education level 1	-0.312	0.125	-2.493	695.771	.013	*
Education level 2	-0.306	0.135	-2.261	710.426	.024	*
Education level 3	-0.218	0.124	-1.758	677.140	.079	.
Education level 4	-0.281	0.124	-2.268	701.078	.024	*
Education level 5	-0.258	0.137	-1.885	709.730	.060	.
Age	-0.125	0.029	-4.373	779.741	< .001	***
Gender	-0.113	0.055	-2.067	697.073	.039	*
Household size	-0.055	0.027	-2.044	831.938	.041	*
Income * buffer	0.148	0.076	1.957	298.121	.051	.
Income * Debt-to-Income	0.006	0.041	0.142	393.536	.888	
Income * income volatility	0.042	0.027	1.581	908.925	.114	
Income * employed	0.414	0.167	2.479	370.622	.014	*

*Table A12. Results of the pooled robust regressions for the model with the relative size of income shocks as a measure of income volatility. The standardized regression parameters (β), standard errors (σ), t-statistics (t), and p-values (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

	β	**σ**	***t***	***df***	***p***	
Intercept	0.961	0.185	5.198	487.291	< .001	***
Income	-0.618	0.168	-3.674	360.414	< .001	***
Buffer	-0.657	0.077	-8.509	255.229	< .001	***
Debts	0.222	0.030	7.485	623.690	< .001	***
Income volatility	0.002	0.024	0.067	922.414	.946	
Employed	-0.228	0.138	-1.650	538.539	.099	.
Conscientiousness	-0.063	0.035	-1.780	186.898	.077	.
Emotional stability	-0.051	0.037	-1.384	168.649	.168	
Extraversion	0.024	0.036	0.668	175.761	.505	
Openness	0.045	0.035	1.265	192.945	.207	
Agreeableness	-0.018	0.035	-0.507	213.865	.613	
Education level 1	-0.338	0.121	-2.780	735.198	.006	**
Education level 2	-0.342	0.131	-2.606	761.849	.009	**
Education level 3	-0.260	0.120	-2.160	724.533	.031	*
Education level 4	-0.336	0.120	-2.791	745.363	.005	**
Education level 5	-0.310	0.133	-2.328	747.325	.02	*
Age	-0.122	0.028	-4.319	805.022	< .001	***
Gender	-0.121	0.054	-2.231	680.986	.026	*
Household size	-0.053	0.026	-2.029	865.471	.043	*
Income * buffer	0.130	0.076	1.718	292.773	.087	.
Income * debts	-0.005	0.034	-0.154	479.361	.878	
Income * income volatility	0.033	0.022	1.522	815.120	.128	
Income * employed	0.370	0.162	2.282	399.438	.023	*

*Table A13. Results of the pooled robust regressions for the models with the different aspects of financial stress as the independent variable. For each model, the standardized regression parameters (β), standard errors (σ), t-statistics (t), and p-values (p) are provided. Significance is indicated with *** (p < .001), ** (p < .005), * (p < .05), and . (p < .10).*

Independent variable:	**1. Money shortage (R^2 = .34)**					**2. Lack of control (R^2 = .29)**				
	β	**σ**	***t***	***p***		**β**	**σ**	***t***	***P***	
Intercept	0.675	0.171	3.946	< .001	***	0.868	0.191	4.535	< .001	***
Income	-0.628	0.157	-3.997	< .001	***	-0.376	0.171	-2.201	.028	*
Buffer	-0.598	0.071	-8.401	< .001	***	-0.596	0.080	-7.445	< .001	***
Debts	0.218	0.029	7.487	< .001	***	0.223	0.030	7.525	< .001	***
Income fluctuation	-0.042	0.023	-1.787	.074	.	-0.003	0.026	-0.121	.904	
Employed	-0.160	0.129	-1.245	.214		-0.222	0.142	-1.567	.118	
Openness	0.036	0.033	1.104	.271		0.031	0.036	0.856	.393	
Conscientiousness	-0.045	0.032	-1.398	.164		-0.031	0.035	-0.881	.379	
Agreeableness	-0.009	0.033	-0.262	.794		-0.033	0.035	-0.924	.356	
Emotional stability	-0.031	0.033	-0.932	.353		-0.049	0.037	-1.345	.18	
Extraversion	0.018	0.032	0.548	.584		0.048	0.037	1.313	.191	
Education level 1	-0.234	0.115	-2.032	.043	*	-0.432	0.127	-3.413	< .001	***
Education level 2	-0.201	0.124	-1.623	.105		-0.361	0.137	-2.647	.008	**
Education level 3	-0.144	0.114	-1.261	.208		-0.209	0.125	-1.671	.095	.
Education level 4	-0.204	0.114	-1.781	.075	.	-0.313	0.125	-2.505	.012	*
Education level 5	-0.194	0.125	-1.550	.122		-0.308	0.138	-2.239	.025	*
Age	-0.140	0.026	-5.284	< .001	***	-0.113	0.029	-3.911	< .001	***
Gender	-0.064	0.051	-1.255	.21		-0.050	0.056	-0.892	.373	
Household size	-0.043	0.025	-1.749	.081	.	-0.020	0.027	-0.761	.447	
Income * buffer	0.202	0.075	2.699	.007	**	0.054	0.080	0.678	.498	
Income * debts	0	0.033	0.008	.994		-0.004	0.035	-0.119	.906	
Income * income volatility	0.037	0.025	1.474	.141		0.048	0.027	1.768	.077	.
Income * employed	0.342	0.153	2.235	.026	*	0.232	0.164	1.413	.158	

	3. Worries (R^2 = .27)					4. Short- focus (R^2 = .05)				
	β	σ	*t*	*p*		β	σ	*t*	*p*	
	0.893	0.192	4.641	< .001	***	2.303	17.988	0.128	.898	
	-0.578	0.169	-3.416	< .001	***	-1.794	11.494	-0.156	.876	
	-0.619	0.081	-7.663	< .001	***	-0.305	0.109	-2.787	.006	**
	0.111	0.029	3.862	< .001	***	6.671	61.398	0.109	.914	
	-0.008	0.026	-0.319	.75		-0.023	0.031	-0.732	.464	
	-0.170	0.143	-1.190	.234		-0.272	0.188	-1.448	.149	
	0.049	0.038	1.287	.2		0.025	0.037	0.669	.504	
	-0.084	0.040	-2.076	.04	*	-0.033	0.037	-0.895	.372	
	-0.007	0.036	-0.195	.845		-0.015	0.036	-0.425	.671	
	-0.036	0.039	-0.925	.356		-0.038	0.037	-1.047	.296	
	-0.020	0.038	-0.515	.607		0.013	0.036	0.363	.717	
	-0.235	0.129	-1.818	.07	.	-0.235	0.158	-1.488	.138	
	-0.327	0.139	-2.353	.019	*	-0.199	0.187	-1.064	.288	
	-0.319	0.128	-2.495	.013	*	-0.144	0.149	-0.971	.332	
	-0.347	0.127	-2.725	.007	**	-0.182	0.160	-1.136	.257	
	-0.326	0.141	-2.315	.021	*	-0.236	0.180	-1.308	.192	
	-0.070	0.029	-2.381	.017	*	-0.066	0.034	-1.982	.048	*
	-0.174	0.056	-3.099	.002	**	-0.064	0.060	-1.054	.292	
	-0.059	0.027	-2.153	.032	*	-0.027	0.033	-0.809	.419	
	0.160	0.077	2.066	.04	*	0.030	0.086	0.347	.729	
	-0.006	0.034	-0.162	.872		-3.999	39.192	-0.102	.919	
	0.044	0.028	1.603	.109		0.028	0.034	0.807	.420	
	0.302	0.162	.861	.063	.	0.548	0.264	2.075	.039	*

Part II

Non-take-up of social welfare

Chapter 4

Determinants of welfare non-take-up: a scoping review and new theoretical framework

Based on:
Simonse, O., Jensen, N., Bomm, L., Van Dijk, W. W., Van Dillen, L. F. & Van Dijk, E. Determinants of welfare participation: a scoping review and new theoretical framework (Submitted for publication). Preprint available on *https://osf.io/h2983/*

ABSTRACT

The current study aimed to identify the determinants of welfare non-take-up from the literature and provide a theoretical framework for policy and future research. We conducted a scoping review according to PRISMA-ScR and critically assessed the evidence. We included studies published in the last ten years from developed countries if their primary goal was to examine the non-take-up of government welfare programs. After screening, 80 studies remained for analysis. We categorized determinants of non-take-up into four levels: societal, administration, social, and individual. Evidence on the societal level is scarce. At the administration level, the results show strong evidence for the complexity of procedures, informing households about their eligibility, and assistance as determinants of non-take-up. Nudges have thus far had limited effects. At the individual level, administrative burden strongly predicts non-take-up, whereas the evidence for stigma is mixed. Social networks decrease non-take-up, but underlying mechanisms remain unclear.

INTRODUCTION

Even in wealthy countries, many households struggle to obtain socioeconomic security and, as a result, experience financial stress. A growing body of literature links deprivation and financial stress to mental and physical health issue[1–3]. Social welfare systems redistribute income to alleviate and prevent poverty, reduce income shocks, guarantee a basic standard of living, and facilitate access to housing, healthcare, and education[4]. Conversely, welfare programs can help break poverty traps and improve mental and physical health[5]. Also, welfare programs can reduce inequality, increasing happiness and mental health[6,7].

Despite differences in program generosity, eligibility criteria, and governance, social welfare systems globally share the challenges of supporting those who need it most, activating participants to become independent of welfare, and ensuring program integrity. Common policy responses to these challenges are means-testing, welfare conditionality, sanctioning, and anti-fraud measures. Means-testing ensures that only households below certain income and wealth thresholds receive welfare. Welfare conditionality implies that social welfare is seen as a way to alter behavior rather than secure income. Conditions often include work requirements: individuals must actively seek work or participate in education to be eligible. Sanctioning and anti-fraud measures, finally, aim to prevent misuse of the welfare system.

Another challenge of social welfare systems is non-take-up. Welfare participation varies between countries and programs, but non-take-up rates of 30 to 40% for social assistance, housing, and unemployment benefits are not exceptional[4,8,9]. From a policy perspective, these numbers imply that welfare systems are not achieving their goals, undermining their legitimacy[10], and increasing inequality[8]. Not participating in welfare may decrease individual households' well-being and exacerbate poverty[11]. Since many eligible households have children, non-take-up of social welfare may also contribute to intergenerational poverty[12].

The literature on non-take-up has a long history. The body of knowledge on welfare participation is heterogeneous in methods and disciplines. It consists of reviews and theoretical and empirical contributions from economics, sociology, and public administration. Behavioral insights have contributed significantly to the welfare participation literature in the last decade. The first studies of welfare participation focused on welfare stigma, which has maintained a prominent role in the literature[13–15]. Scholars started to systematically include other causes of

non-take-up of welfare from the 1980s onwards. For example, Craig[16] concluded that some groups do not claim due to "some mixture of pride, ignorance, a sense of stigma, reluctance to make the efforts a claim calls for, a desire for self-sufficiency on the part of an individual or family, an unwillingness to become involved with a government agency and a feeling that the whole business is not worthwhile" (p. 543). Around the same time, Van Oorschot[17] presented a framework that integrated a range of promoters and inhibitors of welfare take-up. In his "trigger-threshold-trade-off" model, triggers are events leading to potential take-up. According to this framework, potential claimants must pass certain knowledge and perceived eligibility thresholds before making a trade-off between promoting and inhibiting factors. These factors include, among others, perceived need, perceived utility, and time and effort costs. Economic studies of non-take-up have argued that information, transaction, and learning costs may decrease take-up[8,18]. Behavioral insights have revealed new inhibiting factors affecting non-take-up in the last ten years, such as administrative burden, mistrust, and fear[19,20].

The current study aims to systematically review the literature of the last ten years on determinants of welfare non-take-up by eligible households and propose a new model of welfare participation.

METHODS

The current study was conducted according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for scoping reviews (PRISMA-ScR)[21,22]. We used EPPI Reviewer Web Version 4 to manage the review process. We followed an iterative approach, allowing concepts to emerge and new studies added during the review.

Eligibility criteria (PRISMA-ScR Item 6)

We included peer-reviewed journal articles written in English, Dutch, or German. This comprised review, theoretical, and (quantitative and qualitative) empirical articles published after 2012, when psychology was first applied to the study of welfare participation[20]. However, we did not limit our search to psychological studies. We focused on welfare programs in developed economies, as these are systematically distinct from welfare programs in developing economies due to differences in societal and policy-related levels, the financial systems in place, and general societal wealth[23]. Therefore, we excluded studies conducted in developing countries with different political, cultural, economic, and administrative contexts that could affect the generalizability of findings to developed countries[24]. To be eligible for inclusion, studies had to have welfare non-take-up as one of their primary outcome variables. We excluded studies whose main topics were welfare dependency, welfare deservingness, welfare conditionality, and the consequences of welfare non-take-up, as these topics were beyond this review's aim of identifying determinants of non-take-up. We focused on welfare programs in which the government financially supported adults. We also included programs aimed at (families with) children if their deliverables included financial aid or benefits granted to adults. We excluded programs provided by charities and other organizations, such as food banks and (private) health insurance, as these are not always part of the same public welfare systems and may thus be affected by different promoting and inhibiting factors. We also excluded non-monetary programs, such as the provision of health care and access to education, since financial benefits are likely influenced by a set of take-up promotors and inhibitors distinct from other benefit types.

Information sources and search strategies (PRISMA-ScR Items 7 and 8)

We searched four online databases: Clarivate (Web of Science), EBSCOHost (PsycInfo, PsycArticles, MEDLINE, Psychology and Behavioral Sciences Collection), PubMed, and ProQuest. The search syntaxes were formatted separately for each database.

We iteratively developed the search terms in Table 1, verifying them with four articles[25–28]. One author (OS) created the search syntaxes, and two other authors (LB and JN) peer-reviewed it based on the Peer Review of Electronic Search Strategies (PRESS) guidelines[29]. The Appendix provides the search syntaxes. Not all the terms were included in every search syntax as we tailored the search syntax to the four databases. In addition to performing a database search, we asked three experts on non-take-up of welfare to provide us with relevant articles.

Table 1. Generic search terms. Between search terms in the columns, we used "OR"; between the rows, we used "AND" in the search syntaxes. We tailored the specific search syntaxes to the four included databases.

welfare	receipt	psycholog*	determin*
assistance	recipient	behavio*	caus*
benefi*	enroll*	cognitive	explain
"cash transfer"	underuse	rational	explanation
"social security"	non-take-up	experiment	contribut*
SNAP	NTU		drive*
Medicaid	participat*		
TANF	take-up		
NOT illness	underclaim		
NOT disorder	claim		
	uptake		

Selection process and critical appraisal (PRISMA-ScR Item 9 and 12)

We imported the output from the search strategy into EPPI Reviewer Web Version 4. After removing duplicate items, three authors (OS, LB, and JN) screened all included studies on title and abstract in two steps. First, the three screeners individually screened 1% randomly selected studies individually. Differences were discussed to calibrate the screening process. Second, the remaining 99% were divided among the three screeners. Items marked "include for a second opinion" were discussed with the team before a final decision was taken. Studies included based on title and abstract were then screened on full text. Then, the 80 included studies were critically appraised to assess the relevance and appropriateness of methods.

Critical appraisal and synthesis (PRISMA-ScR Items 19 thru 21)

We coded all included studies using a coding guide. An initial coding guide was developed based on Van Oorschot's[17] comprehensive framework (see Appendix). We followed an iterative process of reading and coding. We used deductive

and inductive analysis: the predefined codes were expanded as new themes emerged[30]. We critically appraised each article, focusing on the operationalization of the independent variables, the appropriateness of the selected method, and the conclusions' justification. We thus performed a framework synthesis[31]: based on Van Oorschot's[17] existing framework, our framework evolved with understandings gained from the included literature.

RESULTS

The identification and screening process

The database search yielded 8,216 records, of which 841 were duplicates. Another 30 records were added during the review process. Of the 7,376 unique records, 7,140 were removed based on title and abstract. Six of the remaining 236 records were excluded because we could not obtain the full texts from the authors. The remaining 230 records were screened based on full-text screening; 150 were excluded at this stage, and 80 were included for analysis (see Figure 1). Table 2 summarizes the characteristics of the included studies.

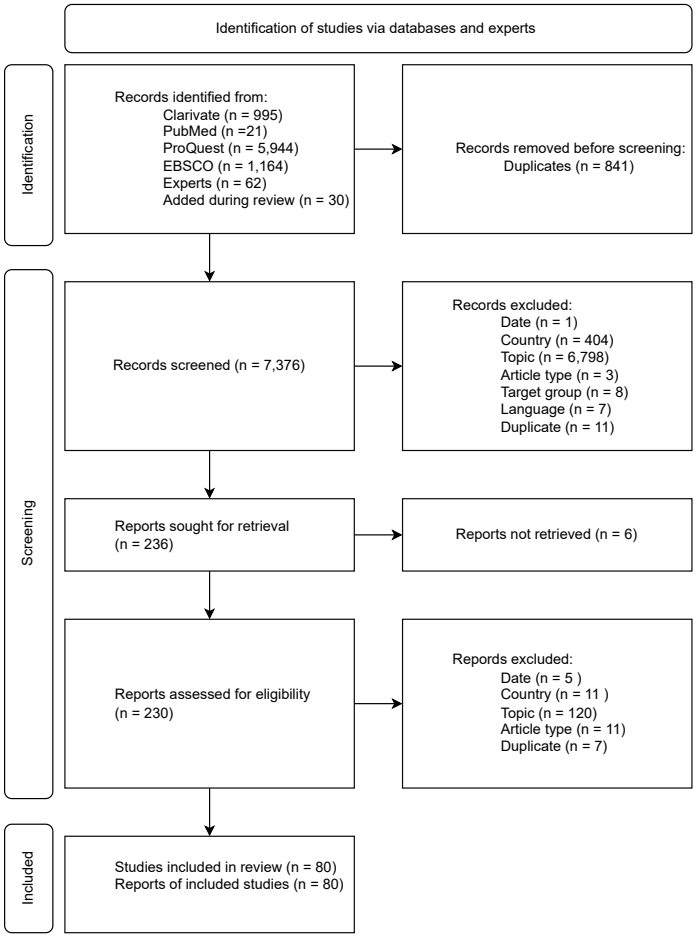

Figure 1. Results of the identification and screening processes. Note. Some articles were excluded based on more than one criterion; therefore, adding the number of included items to the number of exclusions does not add up to the total number of items.

Country and region. The reported studies were conducted in North America (48) or Europe (33). The North American studies were conducted in the US (47) or Canada (1). Of the European studies, 7 took place in the UK, 5 in France, 4 in Belgium, 4 in the Netherlands, 4 in Germany, 2 in Austria, 2 in Norway, and 2 in Finland, Luxembourg, and Switzerland. In addition, two studies examined several countries in Europe.

Study design. Of the 56 quantitative studies, 23 were cross-sectional, and 13 were longitudinal. There were 20 studies with an experimental design (14 randomized controlled trials, four quasi-experiments, and two natural experiments). There were 12 qualitative, 8 theoretical, 4 mixed-methods studies, and 3 non-systematic literature reviews. Notably, 38 out of 56 quantitative studies occurred in North America, whereas 9 out of 12 qualitative studies occurred in Europe.

Benefit types. The included studies examined the non-take-up of benefits aimed at covering a range of costs: health care (17), general expenses for low-income households (14), nutrition (10), disability (9), unemployment (6), children's health care (4), housing (4), pensions (3), parental leave (2), education (2), child care (1), and citizen application (1).

Target groups. Most studies examined low-income households, although this was not always explicitly mentioned. Other target groups included migrants (12), disabled (7), families with children (6), ethnic minorities (5), retired (3), students (2), unemployed (2), elderly (2), single parents (1), pregnant women (1), low-income residents (1), homeless (1), and fathers (1). Some studies included multiple or overlapping target groups (e.g., migrant families with children).

Determinants of non-take-up

This section discusses the factors examined by the studies included in our review. We organized these factors into four levels (see Figure 2). Based on Van Oorschot[17], our initial framework consisted of three levels: scheme, administration, and client. We merged administration and scheme into one level based on the literature reviewed. During the review, two new levels emerged: society and social networks.

Our final framework thus consists of four levels: society, administration, social networks, and individual.

Table 2. Overview of included articles. Note: cells are empty when the study did not examine a specific country/region, benefit type, or target group.

Article	Country/Region
Amétépé (2012)	Luxembourg
Arbogast, Chorniy, and Currie (2022)	US
Arrighi et al. (2015)	France
Auray and Fuller (2020)	US
Baicker, Congdon, and Mullainathan (2012)	NA
Baumberg (2016)	UK
Bettinger et al. (2012)	US
Bhargava and Manoli (2015)	US
Bird et al. (2021)	US
Blavin, Kenney, and Huntress (2014)	US
Boost et al. (2021)	Belgium
Börsch-Supan, Bucher-Koenen, and Hanemann (2020)	US, EU
Brantley, Pillai, and Ku (2020)	US
Bruckmeier and Wiemers (2012)	Germany
Bruckmeier and Wiemers (2017)	Germany
Buysse et al. (2017)	Belgium
Callaghan and Jacobs (2017)	US
Cha and Escarce (2022)	US
Chareyron and Domingues (2018)	France
Chareyron and Domingues (2018)	France
Christensen et al. (2020)	NA
Chyn, Hyman, and Kapustin (2019)	US
Cook et al. (2017)	US
Cordeiro, Sibeko, and Nelson-Peterman (2018)	US
Cranor, Goldin, and Kotb (2019)	US
Dagilyte and Greenfields (2015)	UK
Dahl, Løken, and Mogstad (2014)	Norway
Daigneault and Mace (2020)	Canada
Deshpande and Li (2019)	US
Domurat, Menashe, and Yin (2021)	US
Drange and Jakobsson (2019)	Norway
Engstrom et al. (2019)	Sweden
Figlio, Hamersma, and Roth (2015)	US
Finkelstein and Notowidigdo (2019)	US

Study types	Benefit types	Target groups
Cross-sectional	Low income	
Longitudinal	Children's) health care	Families with children
Cross-sectional	Disability	Disabled
Longitudinal	Unemployment, Nutrition	Unemployed, Families with children
Theoretical	Health care	
Cross-sectional		
Randomized controlled trial	Education	Students
Randomized controlled trial	Low income	
Randomized controlled trial	Education	Students
Natural experiment	(Children's) healthcare	
Qualitative		
Cross-sectional	Disability	Disabled
Longitudinal	Nutrition	Disabled, Ethnic minorities
Longitudinal		
Longitudinal	Unemployment	Migrants
Theoretical		
Cross-sectional	Health care	
Natural experiment	Nutrition	
Randomized controlled trial	Low income	
Cross-sectional	Low income	Homeless
Theoretical		
Cross-sectional	Housing	
Qualitative	Health care	Ethnic minorities
Qualitative	Nutrition	Ethnic minorities
Longitudinal	Low income	
Mixed-Methods	Unemployment, Housing	Migrants
Longitudinal	Parental leave	Fathers
Qualitative		Long-term welfare recipients
Longitudinal	Disability	Disabled
Cross-sectional	Health care	
Randomized controlled trial		Young people
Randomized controlled trial	Pension	Retired
Longitudinal	Nutrition	Families with children, Ethnic minorities
Randomized controlled trial	Nutrition	

Table 2. Continued

Article	Country/Region
Finn and Goodship (2014)	UK
Flores et al. (2016)	US
Fox, Stazyk, and Feng (2020)	US
Friedrichsen, König, and Schmacker (2018)	NA
Fuchs et al. (2020)	Austria
Furtado and Theodoropoulos (2013)	US
Furtado and Theodoropoulos (2016)	US
Galiani, Murphy, and Pantano (2015)	US
Gibb (2016)	UK
Goldin et al. (2021)	US
Goodman, Elser, and Dow (2020)	US
Greenfields and Dagilyte (2018)	UK
Grossman and Khalil (2020)	US
Guthmuller, Jusot, and Wittwer (2014)	France
Heflin, Li, and Zuo (2022)	US
Heinrich et al. (2021)	US
Herd et al. (2013)	US
Hetling, Kwon, and Saunders (2015)	US
Hotard et al. (2019)	US
Hümbelin (2019)	Switzerland
Hupkau and Maniquet (2018)	NA
Janssens and Van Mechelen (2022)	EU, US
Kim (2013)	US
Ko and Moffitt (2022)	
Linos, Quan, and Kirkman (2020)	US
Manoli and Turner (2016)	US
Matikka and Paukkeri (2022)	Finland
Moynihan, Herd, and Harvey (2015)	NA
Padilla, Scott, and Lopez (2014)	US
Ratzmann and Heindlmaier (2022)	Germany, Austria
Nora Ratzmann (2022)	Germany
Reijnders (2020)	Netherlands
Saavedra (2017)	US
Schmidt, Shore-Sheppard, and Watson (2019)	US
Schweyher, Odden, and Burrell (2019)	UK

Study types	Benefit types	Target groups
Semi-systematic review		
Cross-sectional	Children's) healthcare	Families with children, Ethnic minorities
Longitudinal	Children's healthcare	
Randomized controlled trial		
Mixed-Methods	Low income	
Cross-sectional	Disability	Disabled, Migrants
Cross-sectional	Disability	Disabled, Migrants
Randomized controlled trial	Housing	
Theoretical	Housing	
Randomized controlled trial	Low income	
Cross-sectional	Parental leave	Families with children
Qualitative	Unemployment	Migrants
Cross-sectional	Health care	Pregnant women
Randomized controlled trial	Health care	
Longitudinal	Nutrition	Older adults
Mixed-Methods		
Mixed-Methods	Health care	
Cross-sectional	Low income	Women
Randomized controlled trial	Citizen application fee	Migrants
Cross-sectional	Unemployment	Unemployed
Theoretical		
Non-systematic review		
Longitudinal	Disability	Older adults
Non-systematic review		
Randomized controlled trial	Low income	
Quasi-experiment	Low income	
Quasi-experiment	Pension	Retired
Theoretical		
Cross-sectional	Low income, Health care, Unemployment, Nutrition	Migrants
Qualitative		Migrants
Qualitative		Migrants
Qualitative		
Cross-sectional	Health care	
Cross-sectional	Low income, nutrition	
Qualitative		Migrants

Table 2. Continued

Article	Country/Region
Sheely (2013)	US
Simonse et al. (2022)	Netherlands
Simonse et al. (2023)	Netherlands
Skinner (2012)	US
Sunstein (2019)	
Tempelman and Houkes-Hommes (2016)	Netherlands
Van Gestel et al. (2023)	Belgium
Vinck, Lebeer, and Lancker (2019)	Belgium
Warin (2012)	France
Wright et al. (2017)	US
Zantomio (2015)	UK

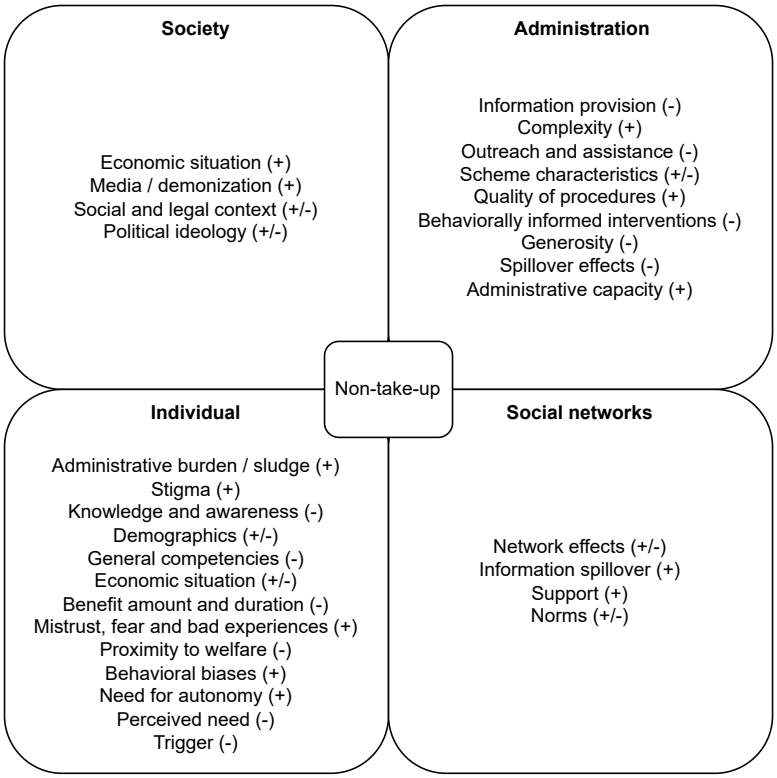

Figure 2. A framework of factors associated with non-take-up; (+) indicates a positive association, (-) a negative association. Within each block, the factors are sorted in decreasing order of the number of times that they were examined.

Study types	Benefit types	Target groups
Longitudinal	Low income	Single parents
Qualitative		
Quantitative	Health care, Childcare	
Cross-sectional	Nutrition	Migrants
Theoretical		
Cross-sectional	Health care	
Natural experiment	Health care	
Qualitative	Disability	Disabled, Families with children
Theoretical		Young people
Randomized controlled trial	Health care	Low-income residents
Natural experiment	Pension	Retired

The societal level

During the review, we found six studies examining the societal factors of the country in which they were conducted. These factors included the economic conditions, the legal context, the dominant political ideology, and negative media attention.

Economic conditions. Two studies examined the relationship between different aspects of the macroeconomic situation and non-take-up. Findings were mixed. Callaghan and Jacobs [32] reported a negative association between unemployment and non-take-up but found no association between a state's economic affluence and non-take-up. Sheely [33] did not find an association between macroeconomic indicators (unemployment rate, average new hire earnings, child poverty rate, and state fiscal position) and non-take-up.

Legal context. There is some evidence that restrictive immigration policies positively relate to the non-take-up of welfare by mixed-immigrant families [34]. In their review, Janssens and Van Mechelen [35] referred to the relevance of the legal context: "For example, the availability of administrative records, the permission of privacy laws to link databases, and the degree to which safe platforms are set up for data sharing between administrations all play an important role" (p. 110).

Dominant political ideology. Two studies examined the association between the dominant political ideology and non-take-up. Callaghan and Jacobs [32] found that "partisanship [of US citizens] is less influential in capturing the

unique variations in state enrolment in each program" (p. 217). Hümbelin[36] used political ideology as a proxy for social norms. He concluded that regions in Switzerland with more left-wing voters had lower non-take-up rates than regions with more right-wing voters. As we will discuss later, this study had some methodological flaws.

Negative media attention. Finn and Goodship[37] stated that "[a] key factor contributing to the stigma attached to claiming or receiving benefits concerns media coverage and the association of many benefits with the 'undeserving poor' and fraudulent claiming" (p. 35) but provided no theoretical arguments or empirical evidence.

In sum, research on societal factors that may affect non-take-up is scarce. There is some evidence that macroeconomic circumstances, the legal context, and political ideology may affect non-take-up. The signs of the association are sometimes positive, sometimes negative. There is currently no empirical evidence that negative media attention increases non-take-up.

The administration level

Forty-eight studies examined the role of administrations in non-take-up. This role includes (changes in) information provision and policy implementation.

Information provision. Providing information to households about their eligibility is often applied to decrease non-take-up[35]. Information provision may include sending letters, emails, or text messages to (a subset of) the eligible population. Eighteen field experiments provided evidence that information provision can decrease non-take-up[38–48], although there were also null findings[49–52]. Cranor, Goldin, and Kotb[53] assessed states that did and did not require employers to notify their employees of Earned Income Tax Credit (EITC) eligibility by law and found no difference in non-take-up. Chareyron and Domingues [54] observed positive results from their intervention, which consisted of sending letters with (simplified) written information. However, this result was only present in particular subgroups (young men and individuals living in rural areas). Herd et al. [20] found that "the host of administrative changes and reforms [..] resulted in a significant enrollment increase in Medicaid" (572). However, since the reforms involved a mixture of interventions, including autoenrollment, simplified procedures, and a communication campaign, it was impossible to establish which interventions were responsible for the positive effects.

Studies typically did not establish the underlying mechanisms that made information provision effective. There may have been different mechanisms at work. For example, study participants may not have known of the existence of a program, may not have been aware of their eligibility, or may have procrastinated on their application. An onle-line survey study that did establish the underlying mechanism was conducted by Bhargava and Manoli [38]. Their results suggested that "interventions shaped behavior by influencing beliefs about eligibility and benefit size, and increasing attention paid to forms [...]" (p. 3492). Another example was Domurat, Menashe, and Yin[39], who sent a reminder of the enrolment deadline to households who had already received information on their eligibility. They found that the reminder decreased non-take-up, suggesting that procrastination caused non-take-up.

Complexity. Several studies provided theoretical arguments for the complexity of rules, eligibility criteria, and application procedures affecting non-take-up[35,37,55,56]. Authors often used administrative burden as a synonym for complexity. Following Moynihan, Herd, and Harvey[57], we argue that "burdens are distinct from rules, pointing instead to the costs that individuals experience in their interactions with the state" (p. 45). Complex rules can affect non-take-up by increasing the administrative burden experienced by (potential) applicants, but also through other routes. Examples of alternative routes are increasing the probability of mistakes by administrators, increasing stigma, increasing confusion, or decreasing understanding[17,35,47].

Studies often used changes in complexity or differences between jurisdictions to assess how complexity affected non-take-up. Decreasing the complexity of information letters, streamlining the application process, and combining the application procedures for different programs were positively associated with lower non-take-up[38,45,58–63]. Increasing reporting requirements and paperwork were positively associated with non-take-up[19,64]. Some studies found that complexity did not affect non-take-up[65,66]. Vinck, Lebeer, and Lancker[47] mentioned that the complexity of the application process could be experienced as burdensome to applicants but did not provide evidence that this affected non-take-up. As indicated above, Herd et al.[20] found that combining reforms to decrease administrative burden decreased non-take-up. Still, they could not isolate the effects of reducing complexity from the effects of administrative burden experienced by households.

Outreach and assistance. Institutions may assist or reach out to citizens to support them in applying for or sustaining their social benefits[37,56,67]. Boost et al.[68] found that a comprehensive, personalized approach, including "seeking contact

with hard-to-reach individuals, identifying their needs, building trust and (re) connecting them to helpful resources" (838), was associated with decreased non-take-up. Several studies found similar results[66,69,70]. Heinrich et al.[19] found that suspending enrollment assistance for Medicaid increased non-take-up.

Moreover, the evidence suggested that the effects of information provision were amplified when combined with assistance[41,49]. Cook et al.[63] found that immigrants required personal assistance to overcome language barriers in the application process. Bird et al.[50] found no effect of providing students with one-on-one college or financial advising. Similarly, Linos, Quan, and Kirkman[52] found no effect of offering phone-based advice to people eligible for EITC.

Scheme characteristics. Several authors have argued that the characteristics of welfare programs may affect non-take-up. Janssens and Van Mechelen[35] indicated that more selective programs had higher non-take-up rates. Buysse et al.[55] theorized that automatic enrolment could decrease non-take-up. Also, non-take-up may be positively associated with sanctions and fraud regulations and negatively with rule flexibility[35,37,56,67]. Empirical evidence supported a positive association between scheme characteristics and non-take-up. Several studies found that more lenient eligibility criteria negatively related to non-take-up[71–74]. Hetling, Kwon, and Saunders [65] examined how differences in Temporary Assistance for Needy Families (TANF) implementation affected non-take-up rates. They found that providing a lump sum to cover emergency expenses and decreasing the lifetime limit positively affected non-take-up. Fuchs et al.[62] found that an extensive reform decreased non-take-up. Because the reform included many changes, the effect of individual changes on the scheme characteristics could not be isolated.

Quality of procedures. The quality of administrative procedures can contribute to non-take-up in various ways. Dagilyte and Greenfield[75] found that unclarity in documentation requirements may have contributed to the non-take-up of welfare by Roma migrants. Unclear procedures and vague eligibility criteria prone to subjectivity could also lead to administrative mistakes and improper denials, contributing to non-take-up[47,58]. Non-native speakers may be extra vulnerable to these practices[69,75,76]. Ko and Moffitt[27] reported that the social benefits programs with the highest non-take-up had non-standardized application and recertification procedures. However, they did not provide empirical evidence to support this claim. Greenfields and Dagilyte[76] mentioned, "[a] confused and inadequately administered welfare benefits system in which administrative staff

[..] appeared to lack knowledge over the precise legal status enjoyed by migrant claimants" (p. 91). They did not provide empirical evidence that this increased non-take-up. In their review, Finn and Goodship[37] concluded that "the behavior of welfare officials towards claimants may also be perceived as humiliating or stigmatizing. This seems particularly likely when an administration acts as a welfare provider and fraud controller" (p. 35). Tempelman and Houkes-Hommes [28] found that non-take-up was higher in large municipalities. They argued: "[t]he larger the municipality, the larger the gap between government and citizens. This makes it harder for municipalities to inform inhabitants about available allowances, resulting in higher non-take-up rates" (p. 693).

Behaviorally informed interventions. Several studies examined the effects of behaviorally informed interventions or "nudges" on non-take-up aimed at counteracting different behavioral biases. These nudges included making the benefit amount more salient[38,50,52,54], reducing stigma[38,40], increasing transparency[40], framing[50], message presentation[50] (visual versus text), the timing of the message[50], and sender[52] (government vs. NGO). None of these studies found an effect on non-take-up. Linos, Quark, and Kirkman[52] concluded: "We believe that the difference in our results largely reflects the difficulty of the task people are being nudged to perform. For low-income households who do not file taxes, the hurdle of submitting a tax return may be too big for a simple outreach effort, no matter how well-designed or behaviorally informed. [..] While nudges are potentially valuable in the policy toolkit, outreach to hard-to-reach populations often needs to include higher-touch interventions that simplify the underlying processes" (p. 6). One study in our review did find an effect: Wright et al.[48] provided enhanced materials to the intervention group, whereas the control group received the state's standard packages. "The enhanced materials were designed to help overcome some behavioral promotors of non-take-up, such as procrastination, complexity, and lack of salience of future benefits" (p. 839). They found that the enhanced materials decreased non-take-up. However, since the materials combined several nudges, they could not identify which aspect(s) made the intervention effective.

Generosity. Some studies found that non-take-up was lower if the potential benefit amount was higher[51,62,65,66,71]. Drange and Jacobson[77] found no effect of an increase in the benefit amount on non-take-up.

Collaboration between institutions. Collaboration between agencies in charge of different benefits can decrease non-take-up. Janssens and Van Mechelen[35] suggested two potential benefits of such collaboration. First, partnerships can

help adopt an outreach approach. Second, interagency cooperation can reduce administrative burden by bundling application procedures. For example, Express Lane Eligibility (ELE) allowed using another agency's eligibility findings (Medicaid/CHIP) to qualify children for health insurance coverage. Blavin, Kenney, and Huntress[59] found that states that made use of ELE had a significant decrease in non-take-up. Cha and Escarce[60] found a similar effect. Combining data or application processes of different social benefits can likely reduce the complexity and, thereby, the administrative burden for citizens, decreasing non-take-up.

Spillover effects. There is evidence that changes in one program can lead to a change in the non-take-up of another program. In particular, expanding Medicaid in the US led to decreased non-take-up in the Supplemental Nutrition Assistance Program (SNAP), EITC, and TANF[60,78], although there were also null findings[79].

Administrative capacity. Callaghan and Jacobs[32] found that states' administrative capacities were negatively related to Medicaid's non-take-up rates. However, they "rely on a rough gauge of state capacity to handle insurance oversight" (p. 229).

In sum, there is compelling evidence that the complexity of eligibility rules and application procedures contributes to non-take-up. Other scheme characteristics, including more lenient eligibility criteria, may reduce non-take-up. Many studies have shown that providing eligibility information to households decreased non-take-up, especially if this information was combined with assistance. Most other behaviorally informed interventions have thus far been unsuccessful in decreasing non-take-up.

The level of social networks

Network effects. Examining how social networks affect behavior is inherently difficult because unobservables are prevalent in social networks, and these unobservables may confound behavior[80]. However, several studies found ways to circumvent these difficulties and demonstrated an association between network effects and non-take-up by using proxies of social interaction in their analyses. Such proxies included the proportion of income support recipients in the region[81], the concentration of immigrants from the same country of origin[82,83], and the non-take-up behavior of neighbors, coworkers, or family members[84–86].

Evidence of the mechanisms through which the network effects operate on non-take-up was much weaker. Mechanisms mentioned were information spillover, support, and cultural norms.

Information spillover. In a qualitative study, Ratzmann and Heindlmaier[87] found that social networks played a crucial role in the welfare mediation process by "provid[ing] information to counter knowledge deficits" (p. 211). In their review of the non-take-up literature, Janssens and Van Mechelen[35] suggested that "[P]eer effects also arise because peers can provide important information in deciding whether to participate in a public program [...]" (p. 101). Figlio, Hamersma, and Roth[82] suggested that similarities in claiming behavior between immigrants from the same country of origin were due to information spillover, but they provided no evidence. Grossman and Khalil[86] concluded that "effects are more likely to represent potential information spillovers during the pregnancy of a mother that induces or encourages her to participate in the Medicaid program, for instance through prenatal care participation" (p. 10). However, they provided no empirical evidence. Dahl, Løken, and Mogstad[85] found "[s]uggestive evidence for information transmission about costs and benefits" (p. 2050). Likewise, Furtado and Theodoropoulos[83] concluded that their evidence "suggests that people learn about the SSI program within ethnic communities and perhaps form norms about the appropriateness of applying" (p. 7).

Support. In their review, Janssens and Van Mechelen[35] stated that "[s]ocial interactions may affect individual non-take-up behavior because of the help that a social network can offer with administrative requirements and the reduction of information costs" (p. 101). Ratzmann and Heindlmaier[87] observed that social networks could "speak on behalf of EU migrants who may not be able to converse in German, but, through their role as translators, empower their clients vis-à-vis welfare administrators when claiming entitlements" (p. 211). Simonse et al[70,88] observed that social support might differ between individuals but found no evidence that this was associated with non-take-up.

Norms. In their review, Finn and Goodship[37] stated that "cultural or group-specific norms unrelated to ethnicity can also influence take-up" (p. 36) and provided theoretical arguments to support this view. Reijnders[89] found empirical evidence that social conventions, cultural norms, and values influenced helping behavior. They reported that socialization played a less prominent role in non-take-up than other factors. Furtado and Theodoropoulos[83,90] suggested that the network effect may operate through social norms. Hümbelin[36] claimed that social norms affected non-take-up but provided only circumstantial evidence; as mentioned above, their data showed a correlation between the prominent ideology in a region and non-take-up.

In sum, there is convincing evidence of an association between network effects and non-take-up. Much less is known about the underlying mechanisms. Potential mechanisms identified included information spillover, support, and social norms, but the evidence was mixed and mostly indirect.

The individual level

The individual level has caught the most attention in non-take-up research in the last decade. Studies have proposed many factors at the individual or household level that contribute to welfare non-take-up.

Administrative burden is "an individual's experience of policy implementation as onerous"[91] (p. S69). It resembles what other scholars call *sludge*: "excessive or unjustified frictions that make it difficult for consumers, employees, employers, students, patients, clients, small businesses and many others to get what they want or to do as they wish"[92]. Several authors provided theoretical arguments for administrative burden's role in non-take-up[26,35,48,57,92]. Indeed, some qualitative studies found that administrative burden affected non-take-up. Dagilyte and Greenfields[75], when interviewing migrants in the UK, found that "considerable numbers of applicants cease their claim, in the belief that they cannot provide all necessary paperwork" (p. 483). Other qualitative studies reported similar findings[19,47,76,87,89,93,94]. Simonse et al.[70,88] reported that administrative burden played a role in local but not national benefits programs. Zantomio[66] found no support for administrative burden contributing to non-take-up. Other studies suggested that administrative burden contributed to non-take-up but provided only indirect evidence. Some authors, for example, used proxies such as education level, migrant status, change of jobs, change of address, and language proficiency. The use of proxies was prevalent for multiple factors within this research field in general and on factors at the individual level in particular[28,64,95]. Others referred to administrative burden while examining factors administration level[20,60,64,96].

Stigma involves perceived stereotypes that others have of welfare recipients, feelings of shame associated with these stereotypes, and anticipation of unfair treatment in the application process based on these stereotypes[97]. Building on a long history of research, several authors provided theoretical arguments for stigma contributing to non-take-up[27,35,37,55,98,99]. Five studies in the current review found a positive relationship between stigma and non-take-up[68,70,97,100,101]. Whether stigma played a role may differ between benefits programs: unemployment benefits may be more sensitive to stigma than other benefits[101], and local benefits programs may suffer more from stigma than national programs[70,88]. Other studies found no support

for stigma affecting non-take-up[38,94]. Some authors found an association between non-take-up and demographics, such as age, migrant status, having children, and living in large cities. Based on these findings, they concluded that stigma contributed to non-take-up[28,81,102]. Some studies found that welfare was associated with stigma but did not show an association of stigma with non-take-up[19,47].

General competencies include education level, language proficiency, and cognitive ability but exclude knowledge about specific welfare programs. Christensen et al.[26] argued why executive functions may play a role in non-take-up behavior, especially for the most vulnerable, but provided no empirical evidence. In a review, Finn and Goodship[37] argued that language barriers may contribute to non-take-up. Arbogast, Chorniy, and Currie[64] reported that parents' education level and language proficiency limit children's access to Medicaid. In a longitudinal study amongst elderly eligible for Supplemental Security Income (SSI), Kim[103] reported that education level and functional limitations affected non-take-up. Greenfields and Dagilyte[76] found that "Roma migrants who were often not literate in the language of their country of origin or had minimal knowledge of how to obtain advice were particularly vulnerable to refusal of benefits" (p. 91). Several other studies reported that language barriers or lack of digital skills contributed to non-take-up[63,69,70,87,95]. In contrast, other studies showed no language effects of non-take-up[102,104]. Simonse et al.[88] found no support for executive functions and self-efficacy affecting non-take-up.

Demographics were frequently used as proxies for administrative burden, stigma, or information costs. Some studies found that being a migrant contributed to non-take-up[28,64], especially when combined with other factors, such as lack of knowledge and awareness of a country's benefits system or language proficiency, forming a detrimental cumulation of factors in the case of some individuals[76,87]. Other findings included a positive association between non-take-up and having been incarcerated, living in a rural area, household composition, health, and the size of the municipality[19,28,84,103]. Some studies reported mixed findings regarding migrant status[102,104] or other demographics[81]. Yet other studies found no effects of migrant status[105] or other demographics[95,102] on take-up.

Knowledge and awareness refer to eligible households knowing about the existence of a particular welfare program, being aware that they are eligible, and knowing how to apply. Finn and Goodship[37] and Ko and Moffitt[27] pointed to the relevance of knowledge and awareness in their reviews. In a qualitative study among Roma households in the UK, Dagilyte and Greenfields[75] reported that "knowledge of

the British employment and welfare systems was limited" (p. 478). Flores et al.[95] found a positive association between self-reported lack of knowledge and non-take-up. In their qualitative study among experts, Vinck, Lebeer, and Lancker[47] found that "parents are often unaware that their children might be eligible for the supplemental child benefit" (p. 365). Ratzmann and Heindelmeier[87] found that respondents of different nationalities and educational backgrounds did not "know their rights in Germany" (p. 206). Goodman et al.[106] measured awareness with a survey and found a negative association with non-take-up. Bhargava and Manoli[38] and Daignault and Mace[94] confirmed that low program awareness contributed to higher non-take-up. Simonse et al.[88] found that perceived eligibility was the strongest predictor of non-take-up in two Dutch benefits programs but found no support for general knowledge about these programs as predictors of non-take-up. Other studies confirmed the role of perceived eligibility in non-take-up[38,93].

Economic situation. In their review, Finn and Goodship[37] reported, "Economic incentives are important for take-up: the pre-benefit income and the estimated value of a benefit are strongly related to the probability of take-up. This finding is probably the most robust result in the literature" (p. 33). The finding is supported by some of the studies included in our review[95,102,103]. Other studies found that the relationship between income and non-take-up was non-monotonic. Chareyron and Domingues [54], for example, found that "[d]espite the assumption that the poorest households are most in need of the program, [...] the poorest individuals have the lowest probability of take-up" (p. 182). Saavedra[107] and Tempelman and Houkes-Hommes[28] confirmed this finding. Chareryron and Domingues[54] reported that those closer to the labor market were less likely to take up benefits. Chyn, Hyman, and Kapustin[84] found mixed support for an association between income and employment status on the one hand and non-take-up on the other.

Information cost, defined by Janssens and Van Mechelen[35] as the "expected, perceived and experienced time and effort that people have to invest in gathering the information on the existence of public provisions, the eligibility criteria, the claiming process, and its consequences" (p. 100) arguably increased non-take-up[35,55,98]. Two studies showed the presence of information costs but did not explicitly link these to non-take-up[47,94]. Three other studies claimed such an association, but they used proxies for information cost such as occupational status, education level, occupational status, age, gender, having children, living in large cities, having a physical limitation, and being newly eligible [28,54,102]. This evidence was, therefore, circumstantial.

Benefits amount and duration. Theoretical studies argued that the utility of applying for benefits increased with the amount and duration[35,37]. Empirical studies confirmed the relation of benefits amount[28,94,105] and duration[95] with non-take-up. Tempelman and Houkes-Hommes[28] also suggested that benefits duration may affect non-take-up but drew this conclusion from proxies (home ownership, job vacancies in the municipality, household composition). Vinck, Lebeer, and Lancker[47] mentioned benefits amount and duration but did not explicitly link them to non-take-up.

Mistrust, fear, and bad experiences. Five studies showed that previous experiences with claiming benefits may result in fear and mistrust, increasing non-take-up. Heinrich et al.[19], for example, found that the consequences of accepting welfare for a family's ability to get citizenship inhibited households from taking up benefits. Simonse et al.[70] reported that the fear of reclaims was the main reason for low-income families from taking up benefits. In a quantitative study among a broader group of eligible households, the fear of reclaims did not play a role[88]. Dagilyte and Greenfields[75] reported that the lack of precise reasons for rejection was the cause of frustration for eligible Roma migrant families. Still, they did not explicitly link this to non-take-up. Likewise, Schweyher, Odden, and Burrell[101] found that "many now believe that claiming certain benefits might harm the claimant's future right to stay in the country" (p. 114), but they did not present empirical evidence that this impacted non-take-up.

Proximity to welfare indicates that households already use some form of welfare. Three studies showed that households eligible for a welfare program were more likely to participate if they already used other forms of welfare[28,81,107]. Wright et al.[48] concluded that the effects of their intervention "were larger in a population whose members had already expressed interest in obtaining coverage, but the effects were more persistent in low-income populations whose members were already enrolled in other state assistance programs but had not expressed interest in health insurance" (p. 838).

Behavioral biases. Theoretical arguments supported that behavioral biases, such as procrastination, present bias, unrealistic optimism, limited self-control, susceptibility to channel factors, reference dependence, and framing, may affect non-take-up[35,92,98]. No empirical evidence, however, supported this idea.

Need for autonomy. Three studies found that the need for autonomy or self-reliance contributed to non-take-up[70,89,101]. Reijnders, Schalk, and Steen[89], for example, wrote: "The second most important determinant for non-take-up that we derived from our data is the desire to retain one's (feeling of) independence and self-esteem" (p. 1369).

Perceived need. Simonse et al.[88] found that lack of perceived need was positively associated with non-take-up of child support and healthcare benefits. Chyn, Hyman, and Kapustin[84] claimed that perceived need was negatively related to non-take-up, but they used children's employment, earnings, school performance, and having been arrested in the two years as proxies. Thus, their evidence was indirect.

Triggers. Based on Van Oorschot's[17,108] work, both Finn and Goodship[37] and Janssens and Van Mechelen[35] mentioned that triggers, defined as sudden disruptive events, can stimulate people to put in a claim. Thus far, there is no empirical evidence to support this.

To sum up, many individual-level factors could contribute to non-take-up. The strength of the empiric evidence was mixed. In many studies, proxies were used to establish a relationship with non-take-up. The most robust empirical support existed for administrative burden, general competencies, specific demographics (e.g., being a migrant), and knowledge and awareness.

DISCUSSION

Many studies have examined potential determinants of welfare take-up in the last decade. Researchers from various disciplines have focused on different factors, using specific methodologies and terminology. This fragmentation hampers further advancement of welfare participation research. Based on a systematic literature review, we provide a new theoretical framework for studying welfare participation organized in four levels: society, administration, social networks, and individuals.

Determinants of welfare participation

At the level of society, there is some evidence that macroeconomic circumstances, political ideology, and the legal context may positively or negatively affect non-take-up. Several authors suggest that negative media attention may result in non-take-up, but empirical evidence is currently lacking.

Complexity and poor quality of administrative procedures are two important drivers of non-take-up at the level of policy and administration. Streamlining application procedures and collaboration between institutions responsible for different welfare programs are promising avenues for decreasing non-take-up. Providing information to households about their eligibility for a welfare program has also proven effective in decreasing non-take-up, especially when combined with assistance with the application process. Most behaviorally informed interventions have thus far been unsuccessful in reducing non-take-up, perhaps because these interventions have been too “light touch” to address the tenacious issue of non-take-up, especially for hard-to-reach groups in the population[52].

At the level of social networks, the evidence suggests that network effects affect non-take-up. Several studies argue that these effects may be due to information spillover, support, and social norms, but little empirical evidence supports these claims. Future studies could empirically examine these and other mechanisms through which social networks affect non-take-up.

At the individual level, there has been an increasing interest in administrative burden as a contributor to non-take-up. Indeed, many studies show that administrative burden can result in non-take-up. However, studies use different operationalizations of administrative burden, limiting the results’ generalizability. Inspired by Moffitt’s[14] seminal article, many authors have examined the potential role of stigma in non-take-up. Thus far, the evidence is mixed: some studies

show an effect, whereas others show null effects or use proxies for stigma. More systematic empirical research is required to come to conclusive results. Most available research points towards education level, language proficiency, and cognitive ability affecting individuals' non-take-up behavior. Also, several studies suggest that specific demographic factors considerably influence welfare non-take-up behavior. The phenomenon of demographic variables leading to non-take-up is particularly worrying when considering that such factors are often impossible to change and may point toward structural inequalities in the accessibility of social benefits.

Gaps in the literature

On several occasions, studies use proxies because barriers or thresholds may be difficult to observe directly. However, not all proxies are equally valid. For instance, "being a migrant" has been used in various ways across studies. Some studies use it as a proxy for stigma and others for administrative burden or information costs. Similarly, studies often vary in how they define and operationalize key terms. For example, administrative burden may be defined differently across studies. Some use it interchangeably with system complexity; others describe it as the experience of overly burdensome rules. Developing a taxonomy and standardized measurement instrument for the determinants of welfare take-up seems worthwhile. Such a taxonomy would increase the comparability of the findings and the generalizability of these results. De Bruijn[109] provided a validated measurement instrument for administrative burden, which may be further developed to include other potential determinants of welfare participation.

Almost all studies depart from the perspective of a specific program. Very few use the household's situation as a starting point, with Boost et al.'s[68] study of Integrated Rights Practices in Belgium as a notable example. Vulnerable families may be eligible for multiple welfare programs, which may increase administrative burden. As a result, welfare systems often paradoxically put the highest burden on those who have the least resources [26]. Future studies may benefit from taking a more integrative approach and starting from the experiences and needs of individual households.

Most studies address potential determinants at one of the four levels. Few studies establish a link between determinants of non-take-up across different levels. Some studies show that the complexity of rules and the poor quality of procedures particularly affect migrants[69,75,76]. Another exception is Baumberg's[97] study, which demonstrates that interventions at the administrative level may

affect determinants at the individual level. There is ample room for studies to examine how determinants at the policy and administration level, such as rule complexity, relate to and interact with determinants at the individual level, such as administrative burden, information cost, and stigma.

Some factors have had little attention in research. Empirical studies of societal determinants of non-take-up are scarce. Future studies could examine the effect of economic circumstances, social and legal contexts, political ideology, and the role of media coverage on non-take-up. At the level of policy and administration, empirical studies on spillover effects, administrative capacity, and automatic enrolment are scarce. As mentioned above, many studies have established a link between social networks and take-up. Future studies could more thoroughly examine the underlying mechanisms. Several mechanisms have been suggested, but strong empirical evidence is lacking.

Thus far, there are only theoretical studies on behavioral biases and trigger events at the individual level. Empirical studies on these factors would be a welcome addition. For other factors, there is limited empirical evidence. This is the case for mistrust, fear, bad experiences, proximity to welfare, perception of need, and the need for autonomy. It would be worthwhile to examine these factors empirically, preferably in different contexts.

Strengths and limitations of the current study

Before the current study, there had been no recent systematic reviews of the determinants of non-take-up of welfare. Performing a systematic review enabled us to draw a more precise picture of the status quo of the literature in this field. It also helped us to provide a comprehensive framework that can be used for future research. Through conducting a systematic review, we were able to identify recurring methodological limitations across studies. Many studies use proxies to study certain specific factors, whereby the adequacy of these proxies might be questioned. Future research could pay more attention to the choice of these proxies.

All empirical studies in this review examine non-take-up in a specific context and often in a particular target group. The results of these studies cannot be indiscriminately generalized to different contexts and target groups. It would be worthwhile to replicate these findings in different contexts and for other target groups.

A limitation of the current study is that we excluded studies in developing countries and studies focused on non-governmental and in-kind welfare programs such as food banks. Also, unlike meta-analysis, our method does not allow for correction for publication bias. The publication bias risk primarily affects the positive findings in the empirical studies included in this review. We expect the risk of publication bias to be less for the null findings.

Policy recommendations

Means-tested welfare systems are designed to target individuals or households with limited financial resources and need assistance to meet their basic needs. To ensure that the assistance goes to those in need, these systems typically have eligibility criteria requiring applicants to meet specific income and asset thresholds. As a result, means-tested welfare systems often have more complex eligibility rules and application procedures than general welfare programs. Moreover, the more precise the targeting is, the more elaborate the eligibility rules and application procedures are likely to be.

Our results indicate that complexity is an important contributor to welfare non-take-up. This implies that policymakers must balance targeting and non-take-up. The literature suggests that vulnerable groups, such as migrants and people with lower levels of education, language proficiency, and cognitive ability, are more likely to forgo benefits to which they are entitled. The evidence suggests that the most effective way to decrease non-take-up is to decrease the complexity of welfare rules. One example is Express Lane Eligibility (ELE). This regulation permits states to rely on findings for income, household size, or other eligibility factors from another program[59]. Secondly, prefilled application forms, already done with tax forms, can serve as an example[61,110].

However, the complexity of welfare rules is a reality that may prove difficult to change, especially in the short run. Our study also provides policymakers with ways to decrease non-take-up within complex systems. The most promising ingredients of effective interventions are information provision, outreach, assistance, and investment in the quality of procedures.

As an example of outreach, automatic enrolment is a promising avenue to decrease non-take-up while maintaining targeting. There is little experience with automatic enrolment in the welfare domain, but the pension domain could serve as an example[111,112].

Providing eligible households with personalized information is an effective and relatively cheap way to decrease non-take-up. Proactively sending letters or e-mails to eligible households that do not take up benefits has proven effective[38–47,81]. The literature suggests that it may be a good idea to aid households that lack the competencies to apply for benefits themselves[19,41,49,68,69,88].

Finally, it seems worthwhile to invest in the quality of administrative procedures and the competencies of street-level bureaucrats. Although there is currently no evidence of the effect of such interventions on non-take-up, the literature suggests vulnerable groups, such as migrants, may especially benefit from quality improvement at the level of administration and street-level bureaucrats [69,75,76,113].

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CHAPTER 4. APPENDIX
SEARCH SYNTAXES

Clarivate

AB = (welfare OR assistance OR benefi* OR “cash transfer” OR “social security” OR SNAP OR Medicaid OR TANF OR “administrative burden” OR “public provision*”)

AND DOP=(2012-01-01/2022-07-19)

AND AB = (receipt OR recipient OR enroll* OR underuse OR non-take-up OR NTU OR participat* OR take-up OR underclaim OR claim OR uptake OR “take up” OR “taking up” OR access)

AND AB = (determin* OR caus* OR explain* OR explanation OR contribut* OR drive* OR factor* OR increase* OR promote* OR inhibit* OR eligible OR decrease* OR alter*)

NOT AB= (disorder OR illness OR Alzheimer* OR dementia] OR vaccin* OR drug* OR pharma* OR contracepti* OR clinical OR patient* OR diabetes)

AND ALL= (“social benefits” OR “social assistance” OR “take up” OR take-up OR non-take-up OR “taking up” OR NTU OR “administrative burden” OR “public provision*”)

AND DT=(Article OR Review OR Data Paper)

AND WC = (Multidisciplinary Sciences or Health Policy Services or Management or Psychology Multidisciplinary or Economics or Environmental Sciences or Health Care Sciences Services or Public Environmental Occupational Health or Psychology Social or Social Issues or Public Administration or Humanities Multidisciplinary or Anthropology or Business or Environmental Studies or Ecology or Psychology or Development Studies or Primary Health Care or Demography or Behavioral Sciences or Psychology Applied or Social Sciences Interdisciplinary or Social Work or Psychology Developmental or Sociology or Family Studies or Political Science or Business Finance or Psychology Experimental or Cultural Studies)

AND CU = (USA or ENGLAND or AUSTRALIA or CANADA or GERMANY or NETHERLANDS or SPAIN or SWEDEN or ITALY or FRANCE or SWITZERLAND or NORWAY or SCOTLAND or JAPAN or DENMARK or BELGIUM or NEW ZEALAND

or FINLAND or AUSTRIA or POLAND or IRELAND or PORTUGAL or WALES or GREECE or ROMANIA or LITHUANIA or SLOVENIA or SLOVAKIA or ESTONIA or LUXEMBOURG or ICELAND or MALTA or LATVIA or NORTH IRELAND or CROATIA)

AND LA = (English or Dutch)

PubMed

((((((welfare[Title/Abstract] OR assistance[Title/Abstract] OR benefit*[Title/Abstract] OR "cash transfer"[Title/Abstract] OR "social security"[Title/Abstract] OR SNAP[Title/Abstract] OR Medicaid[Title/Abstract] OR TANF[Title/Abstract] OR "administrative burden"[Title/Abstract] OR "public provision*"[Title/Abstract]) NOT (visored[Title/Abstract] OR illness[Title/Abstract] OR Alzheimer*[Title/Abstract] OR dementia[Title/Abstract] OR vaccin*[Title/Abstract] OR drug*[Title/Abstract] OR pharma*[Title/Abstract] OR contracepti*[Title/Abstract] OR clinical[Title/Abstract] OR patient*[Title/Abstract] OR diabetes[Title/Abstract])) AND (receipt[Title/Abstract] OR recipient[Title/Abstract] OR enroll[Title/Abstract])) AND (receipt[Title/Abstract] OR recipient[Title/Abstract] OR enroll*[Title/Abstract] OR underuse[Title/Abstract] OR non-take-up[Title/Abstract] OR NTU[Title/Abstract] OR participat*[Title/Abstract] OR take-up[Title/Abstract] OR underclaim[Title/Abstract] OR claim[Title/Abstract] OR uptake[Title/Abstract] OR "take up"[Title/Abstract] OR "taking up"[Title/Abstract] OR access[Title/Abstract])) AND (determin*[Title/Abstract] OR caus*[Title/Abstract] OR explain[Title/Abstract] OR explanation[Title/Abstract] OR contribut*[Title/Abstract] OR drive*[Title/Abstract] OR factor*[Title/Abstract] OR increase*[Title/Abstract] OR promote*[Title/Abstract] OR inhibit*[Title/Abstract] OR eligible[Title/Abstract])) AND ("social benefits" OR "social assistance" OR "take up" OR take-up OR non-take-up OR "taking up" OR NTU OR "administrative burden" OR "public provision*")) AND (("2012/01/01"[Date - Publication] : "2022/07/28"[Date - Publication])) Filters: Humans, Adult: 19+ years

ProQuest

ab((welfare OR assistance OR "social benefits" OR "cash transfer" OR "social security" OR SNAP OR Medicaid OR TANF OR "public provisions")) AND ab((receipt OR recipient OR enroll* OR underuse* OR non-take-up OR NTU OR participat* OR take-up OR underclaim OR claim OR uptake OR tak* up)) AND ab((determin* OR caus* OR explain* OR explanation OR contribut* OR drive* OR increas* Or effect* OR change* OR increas* OR decrease* OR variation* OR alter*)) AND pd(2012-2022)

Additional filters

- Scholarly journals
- Peer-reviewed
- English or Dutch

EBSCO

AB (welfare OR assistance OR benefits OR “cash transfer” OR “social security” OR SNAP OR Medicaid OR TANF NOT disorder NOT disb* NOT illness NOT illness) AND AB (receipt OR recipient OR enroll* OR underuse OR non-take-up OR NTU OR participat* OR take-up OR underclaim OR claim OR uptake) AND AB (psycholog* OR behavio* OR cognitive OR rational OR experiment) AND AB (determin* OR caus* OR explain OR explanation OR contribut* OR drive*) AND PY 2012-2022

Additional filters

- Peer reviewed arcticles
- Language: English OR Dutch
- Population: female, male, transgender
- Age: > 18

INITIAL CODING SCHEME, BASED ON VAN OORSCHOT (1994)

Scheme level

- Have a 'density' (a large number) of rules and guidelines
- Contain complicated rules
- Contain vague, i.e., imprecise, indistinct and/or discretionary entitlement criteria
- Contain a means-test
- Supplement other sources of income
- Are aimed at groups in society which are the subject of negative valuation
- Provide only small amounts of benefits

Administrative level

- A way of handling claims and claimants that is experienced by the claimants as humiliating or degrading
- Combining a "service"- and a "fraud control" function
- Poor quality of communication with clients, giving insufficient information and advice
- Using complex application forms
- Poor quality of decision-making, e.g., taking decisions on the basis of insufficient information or on the basis of client stereotyping
- Poor quality of technical administrative procedures
- Wrong interpretation of scheme rules by administrators

Client level

- Trigger
- Awareness
- Perception of eligibility
- Attitudes towards outcomes
- Perception of need
- Perception of utility
- Unstable situation

Chapter 5

Social security or insecurity? The experience of welfare participation by financially vulnerable households in the Netherlands

Based on:
Simonse, O., Vanderveen, G., Van Dijk, W. W., Van Dijk, E. & Van Dillen, L. F. Social security or insecurity? The experience of financially vulnerable households with welfare participation. *Social Policy & Administration* **57**, 255–271 (2022). *https://doi.org/10.1111/spol.12849*

ABSTRACT

Social welfare aims to support financially vulnerable households by protecting them from financial shocks and providing them with a basic standard of living. Many eligible households, however, do not take up social welfare. We present the results of in-depth interviews with 31 members of financially vulnerable households in two large Dutch cities about their experiences with welfare. We examined money's role in their lives, what inhibited them from taking up social welfare, and how they sought support. For many interviewed households, money was a source of stress. We found that the fear of reclaims and mistrust in government institutions were the main inhibitors to participating in welfare programs. Whereas the experience of shame and stigma were substantial inhibitors for claiming local welfare benefits, they were not for participating in national welfare programs. Formal and informal help promoted welfare participation, but many participants lacked access to both forms of help. We discuss policies that could decrease the uncertainty associated with benefits receipt and give directions for future research.

INTRODUCTION

> "With child support, I had to repay everything. As I said, I worked through an employment agency, so I don't have one salary. Sometimes, I earned more; other times, I earned less. That was a fact of life. [..] At the end of the year, I got a blue envelope in my mailbox. I had to pay back € 1.500. I thought: "How is that possible?" [..] I had to repay € 150 every month. But if I earned € 1.200 - € 1.300 per month, that was very difficult."

This excerpt is from our interview with a single mother on the weekly street market in a deprived neighborhood in The Hague, the Netherlands[a]. During the interview, she cheered up when she told us that she had recently received a fixed contract, providing her with a stable income. She explained why she no longer used any benefits despite being eligible. Her story illustrated our conversations with financially vulnerable households for the current study.

Relative poverty has profound implications on mental and physical health[2,3]. Research shows that being relatively poor is linked with feelings of uncertainty, stress, and shame[4–6]. Welfare systems aim to decrease financial distress by providing income security for the population in adverse events such as illness, unemployment, retirement, and death[7]. Yet, many eligible households do not participate in the welfare programs intended for them. Non-take-up rates vary between countries and programs, but 30% to 40% rates are not exceptional[7–9]. This means that welfare systems do not achieve their goals, which may undermine their legitimacy and increase inequality[8]. For individual households, not participating in welfare lowers their well-being and may exacerbate poverty[10].

Theoretical and quantitative studies have identified numerous potential inhibitors for welfare participation, including welfare stigma[11–13], transaction costs, learning costs, psychological costs[14–16], administrative burden, fear of reclaims, and lack

a Deprived neighborhoods in the Dutch context are characterized by a concentration of several problems: high unemployment and crime rates, mental and physical health problems, violence, et cetera. These often coincide with a large portion of their populations having incomes /below the (Dutch) poverty line The poverty line lies at the point below which people do not have the means for the goods and facilities that are considered the minimum necessary in Dutch society.

of social support[16–20]. Promotors of welfare participation include knowledge of program criteria, perceived eligibility, and perceived utility[21–23]. It is well-established that more complex systems with more eligibility criteria go hand-in-hand, with a smaller fraction of the eligible population participating[24]. This generates a paradox: more targeted social welfare development results in more stringent rules and, hence, lower take-up, which likely disproportionally affects the most financially vulnerable.

There is evidence that formal and informal support may stimulate welfare participation[17,25]. However, there is little research on how the financially vulnerable find formal and informal support when needed. Several studies have shown, however, that feelings of mistrust and shame are higher among groups with lower socioeconomic statuses[5,26,27]. Mistrust and shame may well inhibit help-seeking behavior.

Few studies have examined how eligible households, especially financially vulnerable ones, experience welfare participation. Understanding these experiences may help develop more inclusive social welfare systems that target needy households better. To this end, the current study aims to grasp the lived experiences of financially vulnerable households eligible for benefits. It captures their experiences of being financially vulnerable, what inhibits them from using welfare, and where they turn for help when needed.

The remainder of this article is organized as follows. We start with an overview of the literature on welfare participation. Then, we describe the methodological approach and the results. We end with conclusions, policy implications, and further research directions.

WELFARE PARTICIPATION LITERATURE

Financial vulnerability

Even in affluent welfare states, being financially vulnerable brings insecurity and fear[4]. Low socioeconomic status is strongly related to stress and rumination[6,28,29]. According to Sen[5], feelings of shame are at the center of relative poverty. There is ample evidence of the impact of financial vulnerability on mental and physical health[2,3,30,31]. A recent line of literature suggests that the subjective feeling of financial scarcity impedes cognitive functioning. Decreased cognitive performance may negatively affect subsequent behaviors, such as saving, borrowing, and investing, thus exacerbating financial vulnerability[32,33].

Promotors and inhibitors of welfare participation

Initially, the study of welfare participation was pre-eminently the domain of social policy and public administration research. The first studies focused on welfare stigma, which has maintained a prominent role in the literature. Scholars started to systematically include other causes of non-take-up of welfare in the 1970s. For example, based on a literature review, Craig[21] concluded that some groups do not claim due to "some mixture of pride, ignorance, a sense of stigma, reluctance to make the efforts a claim calls for, a desire for self-sufficiency on the part of an individual or family, an unwillingness to become involved with a government agency and a feeling that the whole business is not worthwhile" (p. 543). Around the same time, Van Oorschot[22] presented a comprehensive framework that integrated a range of promoters and inhibitors of welfare take-up. According to his model, potential claimants must first pass certain thresholds (knowledge and perceived eligibility) before making a trade-off between promoting factors, such as perceived need, and inhibiting factors, such as negative attitudes towards welfare.

Another primary line of welfare participation research comes from economics. Economic models have examined the issue by balancing welfare participation's benefits (utility and need) and costs (transaction costs, learning costs, psychological costs, and stigma)[14,15,34].

Behavioral insights have contributed significantly to the welfare participation literature in the last decade. In public administration, scholars now realize that administrative burden, defined as "an individual's experience of policy implementation as onerous," looms larger for citizens with less human capital and thus increases inequality[18,35–37]. Behavioral economists have developed

interventions to increase welfare participation. These include interventions that counteract psychological inhibitors of welfare participation, such as unawareness, informational complexity, and (non-cognitive) application costs[25,38–40].

Financial support and help

To our knowledge, few studies have examined how financially vulnerable households seek help. From a theoretical perspective, there is reason to suspect that financially vulnerable households may experience thresholds for seeking help. Evidence shows that trust is lower among financially vulnerable households in affluent countries[26]. Also, relative poverty brings about shame[5] and social exclusion[41]. At the same time, studies show that formal and informal support help may promote welfare participation[17,25].

The current study

The academic literature on welfare participation tends to be theoretical, and most empirical studies in this area are quantitative. Quantitative research has the advantage that it provides generalizable knowledge. However, it often lacks depth and context[42]. Many important characteristics of people and communities cannot be meaningfully reduced to numbers or adequately understood without referencing the local context in which people live[43]. Examples of such characteristics are identities, perceptions, and beliefs. In the case of social welfare, it seems especially worthwhile to understand better the experiences of financially vulnerable households with welfare participation. This understanding may help the development of inclusive social security systems that have a bigger chance of reaching their goal of supporting the financially vulnerable. Currently, there are few systematic studies of the experience of welfare dependence and welfare participation for those that social welfare primarily intends to target: the financially vulnerable. The current study examined the lived experiences of financially vulnerable households with welfare participation. It aimed to reveal what it means to be financially vulnerable, which barriers financially vulnerable households experience when applying for benefits, and where they find help in case of difficulties.

Income support in the Dutch welfare system

This text box provides a brief overview of the main elements of income support in the Netherlands. Also, it provides some background on the benefits scandal that has occupied Dutch society since 2017. The Appendix contains a more detailed description of both.

Local benefits. The Participation Law (*Participatiewet*) mandates local municipalities to move people toward the active labor force and aims mainly at the unemployed and those with meager incomes[44]. Programs under the Participation Law tend to have strict eligibility rules, such as the obligation to search for jobs. Non-take-up rates for these programs vary significantly between different provisions and municipalities.

National benefits. The three primary national income support programs are healthcare, rent, and child support benefits. These programs target many in the population. The take-up rates were between 84 and 90% in 2018. In addition, a childcare benefits scheme allows parents to hire childcare to work. For all four programs, applicants receive an advance payment based on their estimated income, which is settled at the end of the year. This mechanism results in a large number of retroactive corrections. In 2018, there were 2.3 million reclaims.

The benefits scandal. Our study took place against the backdrop of what is referred to as “the benefits scandal” in the Netherlands; the tax office unjustly accused around thirty thousand households of fraud with childcare benefits. Households were required to repay large sums of received benefits, often causing severe debts and a cascade of problems in all areas of their lives, such as loss of job or home, relocation of children, and mental and physical health problems. The scandal has received a lot of media coverage.

METHODS

The current study was part of Moneytalks, a qualitative research program of the Dutch Ministry of Finance, to gather the experiences of financially vulnerable households with different aspects of personal finances. We collected data through in-depth interviews to capture the experiences of financially vulnerable groups. These groups are less likely to participate in quantitative studies and thus risk marginalisation[42,45]. Our research objectives fit best with an interpretative phenomenological epistemology[46]. We chose an interpretative research paradigm rooted in the phenomenological and hermeneutic research traditions[47–49].

Study participants

The interviews were conducted with four trained and experienced interviewers (one female and three males). Their experience included interviewing people about financial matters. The first author trained them in the specific content matter: social welfare. We performed the interviews in pairs of varying compositions. The interviewers and interviewees did not know each other before the interviews.

The sample was diverse in terms of household composition (couples, singles, divorced, widowed; with and without children), income situation (student, employed, self-employed, unemployed, disabled, and retired), and cultural backgrounds (with and without migration backgrounds). Of the 24 interviews, we excluded three from our analyses because the participants – relatively wealthy couples – did not belong to the target group of our study. Of the remaining 21 interviews, 12 were with one participant, 8 with two participants, and one with three participants. The interviews took between 20 and 55 minutes. See Table 1 for an overview of the sample.

The interviewers came from different socioeconomic and cultural backgrounds than most interviewees. The interviewers were white and highly educated, held well-paid jobs, and had fixed contracts. Many of the interview participants were in financially dire circumstances and had lower levels of education. Some were first- or second-generation migrants. These differences in backgrounds might result in prejudices in both directions and distance between interviewers and interviewees. To address these potential issues, the interviewers discussed them at the start to raise awareness of them. Also, they dedicated ample time and attention during the interviews to create an atmosphere of trust and equality and practiced active listening without prejudice.

Table 1. Overview of Participant Characteristics

	The Hague	Eindhoven	Total
Gender			
Male	6	3	9
Female	10	12	22
Work status			
Employed	10	4	14
Housewife	1	1	2
Retired		3	3
Self-employed	3	2	5
Student	1		1
Unemployed	1	5	6
Cultural background			
Migration background	4	6	10
Native Dutch	12	9	21
Single or couple			
Couple	11	6	17
Single	5	9	14

Participant recruitment

We collaborated with an organization specializing in qualitative research amongst groups generally excluded from (quantitative) research. We recruited and interviewed people in a weekly street market in a deprived neighborhood in The Hague and the city center of Eindhoven. We chose places that attracted a broad audience with diverse socioeconomic and cultural-ethnic backgrounds and where people were not in a hurry. Representativity was not an aim of our sampling strategy; however, we did perform diversity sampling to obtain experiences from various groups. We recruited potential participants in the streets by asking them whether they wanted to share their experiences with making ends meet.

The Hague and Eindhoven are the Netherlands' third and fifth largest cities, with half a million and a quarter of a million inhabitants, respectively. Reliance on government support is somewhat higher in The Hague: 24% of households received support in at least one domain, compared to 20% in Eindhoven. In 2017, 10.3% of households in The Hague lived under the poverty line, compared to 6.8% in Eindhoven[1]. Both cities have active anti-poverty policies, including a service point where inhabitants can ask about work, health, children, and well-being.

We informed participants that the general goal of the research was to capture their personal experiences with financial matters. We did not reveal our interest in non-take-up until the debriefing stage to obtain their unbiased and spontaneous responses. In both locations, we interviewed participants until we reached a saturation point, as jointly decided by the interviewers. We offered no monetary compensation because we wanted to include participants who were intrinsically motivated to share their experiences. All participants provided informed consent. The Leiden University Psychology Ethics Committee provided approval in advance of the interviews (protocol number V2-2982).

Data collection

We used semi-structured interviews, which enabled us to make participants feel at ease talking about a potentially sensitive subject[50]. Also, semi-structured interviews can address theoretically driven variables while providing room for lived experience[51]. Finally, semi-structured interviews enabled us to explore the context-specific variation between households[47,52].

We held the interviews in public places with an informal ambiance while ensuring privacy at the same time. To create a homely setting, we set two tables (one inside, one outside) with attributes, such as a tablecloth. Being aware that the Ministry of Finance might encounter distrust and distance, we took ample time to create an open atmosphere. We explained that our research aimed to determine how people make ends meet with a low income because we wanted to help them. We stressed that we wanted "real stories, not the opinions of civil servants or scientists, but the experiences of people who know what life looks like." We also stressed to participants that we ensured their privacy and that they could refrain from answering questions or stop their participation at any time without negative consequences. To ensure that participants were at ease, we first asked them to say something about themselves (their household composition, daily activities, etc.). We offered participants coffee, tea, or a soda.

We used an interview guide (see Appendix) in plain language to ensure the participants understood the questions. We developed the interview guide in an iterative process with the interviewers and the co-authors based on a literature review on financial vulnerability, non-take-up of social welfare, and getting help. The interviews consisted of open-ended questions in three blocks. The first block aimed to collect participants' thoughts and feelings about money and its role in their daily lives. It included experiences with making ends

meet, borrowing, and saving. The second block captured potential inhibitors for claiming benefits. In the third and final block, we asked participants if and how they looked for help when they could not figure out financial matters themselves.

In the first four interviews, relatively much time was spent on the first block, after which there was little time left for the main focus of our study. Therefore, we decided to spend more time on the second block from the fifth interview onwards.

After the core part of the interviews, we revealed that welfare participation was our prime research interest at the debriefing stage. Because participants could perceive the research subject as sensitive, extra care was given to potential stress or other negative emotions during the debriefing stage to prevent harm. We provided an information letter in plain language for the participants to take with them, including contact details if they wanted more information on the study. We recorded and transcribed the interviews non-verbatim; we removed elements such as interview noise, corrected grammar, and stutter from the transcriptions[53].

Data analysis

At the end of both field days, the interviewers discussed themes that had emerged during the interviews. We included the field notes from these sessions in our analysis. We applied computer-aided qualitative data analysis (CAQDA) using ATLAS.ti version 9. The first author coded the interviews. In the first iteration, he read the transcripts while listening to the audio recording, capturing nuances not visible in the transcriptions, such as hesitations, lapses, interruptions, and emotions. He followed an iterative process of reading, coding, and analysis. He used a combination of deductive and inductive analysis: the predefined set of codes (see Appendix) was expanded as new themes emerged[54]. Examples of predefined codes included “Stress and worries” and “Perceived eligibility.” Examples of codes that emerged were “Health issues” and “Mistrust in government.” After reading all the interviews, he performed an integrative analysis. He collected emerging themes and made connections by performing thematic co-occurrence analysis[55]. He then had a session with the other three interviewers to reflect on the emerging patterns. The other three interviewers reviewed the description of the results.

RESULTS

We observed that, after some initial hesitation, people talked openly about their finances, life events, and experiences with benefits. Some showed anger and sadness when talking about their experiences with money. One participant indicated she did not want to talk about her financial experiences. After suggesting to her to stop the interview, she decided to continue.

Money experiences

Associations with money

We asked participants to mention the first thing that came to mind when we said "money." The majority of participants had negative thoughts and feelings about money. They associated money with sadness, pain, and difficulties making ends meet. One participant described this as "one big fight," Another compared money with a "punishment." One participant said:

> "Two for the price of one. That is what comes to mind. And food that you can buy but don't want to eat. Buying the cheapest vegetables. Not because you like them, but because you can buy them."

For many participants, stress was the dominant feeling associated with money. Some spontaneously mentioned "panic." A considerable number of participants linked money to health problems. For example, one participant told us she could not afford to go to the dentist and had terrible teeth. She could hardly chew and said, "I am ashamed to smile." Negative attitudes towards money were more common among self-employed and unemployed, those with a migration background, those with fluctuating incomes, and single participants (divorced or otherwise).

When participants had positive experiences with money, these mainly included the absence of stress and not worrying. "Rest" was a word participants often used. This association was more common among participants that had stable incomes. Some mentioned that money gave them a feeling of freedom and the ability to do nice things, such as vacations and outings. Others had ambivalent or neutral associations with money. For example, one female participant (45) spontaneously said "heaven and hell" when we asked to mention the first thing that came to mind. She explained that she had a love-hate relationship with money by saying:

> "Yes, because, as I said, you need money to live. And that can be a great concern. I've had times that I had so little that I could hardly buy food, you know. But on the other hand, money also gives you a lot of freedom, of course."

She told us that – if she had more money – she would help poor people. And for her, having more money was associated with not worrying.

Financial behavior

Balancing income and expenditures. Many participants indicated that they had difficulties making ends meet. These difficulties were closely related to negative associations with money, especially stress and worries, and were more common among the unemployed and self-employed. For the unemployed, the latter finding is likely due to low incomes, whereas income fluctuation may play a role for self-employed participants. Difficulties making ends meet were less common among couples, which is in line with the finding that, for most couples, at least one of the two had a paid job.

Borrowing and debts. We asked participants about their experiences with borrowing and debts. Most participants had very negative attitudes towards debt. These negative attitudes were strong for those who had experiences with debts, as one divorced woman told us:

> "The last years of my marriage were terrible financially. And then with bailiffs at the door. And I never ever want that again. So, I make sure that I make ends meet. Then, if necessary, eat bread for a few days, but I will never get indebted again. I know what that results in."

Participants generally indicated that they preferred borrowing from a relative to borrowing from an institution. Some were not worried about borrowing from their parents; others did feel bad about this because they realized that they had to pay back the amount or were afraid it would hurt their relationship with their parents. Sometimes, participants did not see a loan from a relative as a

"real" debt. Participants generally regarded a debt to the tax administration very negatively. This negative view seemed to result from the "harshness" of the tax administration in reclaiming debts. A few participants were still heavily indebted when we spoke to them. One young mother told us that her debts totaled € 100,000. These debts were mainly due to not paying rent and because the tax administration reclaimed unjustly paid childcare benefits. She was at peace with the fact that a curator managed her finances. This gave her "rest," although she would like to manage her finances again in the future because this would make her feel proud of herself.

Financial buffers and savings. Most participants indicated having some financial buffer to cover unexpected expenditures, such as replacing a broken fridge. Some only had minimal buffers that were insufficient to cover setbacks. A few participants indicated that they were unable to save at all. Self-employed had more buffers than employed, who, in turn, had more buffers than unemployed participants. Respondents with current or recent unemployment had the lowest buffers. Singles had fewer buffer savings compared to couples and divorced participants. Some participants had a buffer in the form of a relative they could always fall back on. Such a buffer protected them against unexpected expenditures and financial stress.

Meeting financial challenges. We asked participants how they dealt with their financial challenges. Most spontaneously mentioned that they cut spending, for example, by refraining from going on holidays or not buying clothes. Some cut spending at the cost of their health. For example, one participant indicated that she needed orthotics but could not afford them. Another participant, as described above, had stopped going to the dentist, which had resulted in bad teeth. Yet another participant indicated that she had to take a non-diversified diet depending on what was on sale in the supermarket. In addition to cutting spending, generating additional income, for example, by working more hours, was also mentioned quite often.

Experiences with welfare participation

Fear of reclaims

By far, the most mentioned reason for not using benefits was fear of reclaims. In most cases, this fear was realistic: many participants had previously experienced reclaims. They wanted to avoid the stress of having to repay a received benefit afterward. A young couple without children said:

> "Indeed, when I got that letter, plus that invoice for last year, and saw the amount that I had to repay, then I thought: I immediately quit [using benefits]."

None of the participants was a victim of the benefits scandal. Only two participants mentioned the benefits scandal, which did not contribute to their fear of reclaiming. Notably, the fear of a reclaim often co-occurred with general financial stress. Participants talked about benefits as if they represented a loan. A retired painter of 74 did not apply for benefits anymore because of a reclaim in the past. Instead, he still worked for his son's company and as a self-employed painter to acquire sufficient income. A self-employed woman of 56 told us that she had recently borrowed € 600 from her sister to pay for her son's study trip. At the same time, she did not apply for healthcare and rent benefits, although she was eligible. Only one of the participants was aware of the possibility to apply for benefits retroactively after one's yearly income is known. The fear of reclaims was present amongst participants of varying background characteristics. It was more common, however, for self-employed and divorced participants. Unemployed participants had relatively little experience with reclaims. Some unemployed participants said they received help from the social service with their application. Also, those unemployed for a more extended period had no fluctuation in their incomes and ran no risk of having to repay benefits.

Negative attitudes towards government

Many participants had a negative attitude towards the government and the tax administration. We did not ask for this explicitly; this theme emerged during the interviews. Participants indicated that the government had not helped them when they had needed help in the past. Also, they indicated that the tax administration had made mistakes, resulting in reclaims. A typical example involved a divorced woman without children:

> "Yes, I felt left alone. Even a bit discriminated against. And very sad. Really very sad, yes. You expect … I really needed help. I've always been able to do everything myself. And then I couldn't because of the circumstances. […] And if you are left out in the cold like that, then I think, yes, so many other people dó get help."

There was a clear link between reclaims and mistrust in the tax administration. Many participants felt that the tax administration is responsible for ensuring people receive the correct benefits amount since "they know everything about you." Negative attitudes towards the government were powerful among native Dutch participants. Participants with a migration background less often showed negative attitudes towards the government. Two groups that stood out in mistrust against the government were self-employed and divorced participants.

Lack of knowledge

Some participants lacked knowledge about the benefits they could receive. However, we did not find this a primary cause of non-take-up. Lack of knowledge often resulted from the absence of the necessity of knowing because someone else – for example, children or a professional – took care of the benefits application. Others did not seek information about benefits because they said they did not need them or did not want to "scrounge." Lack of knowledge was more common among native Dutch participants.

Administrative burden

Participants often mentioned the administrative burden associated with social security. However, this administrative burden did not relate to the application process for national benefits, which most participants perceived as very easy. The application for other – often locally administered – welfare programs was experienced as more burdensome. Some participants mentioned that "the government wants to know everything about you," which humiliated them. The administrative burden for national benefits was often associated with updating information with the tax administration whenever one's situation changed. Participants mentioned that this required their continuous attention because they ran the risk of a reclaim. This caused a cognitive load and – on some occasions – stress:

> ".. Because I've done this [applied for healthcare benefits] and then, it changed again, because you earn more then suddenly your benefits will change. So you go from € 12 to € 9 to € 4, and at the end of the year, I have to repay € 180. I'm not in the mood for this! For a few euros. [..]. So you continuously need to keep track of what you're doing. If you don't ... many people just fill it in once and think whatever. And then you get into problems".

Notably, the experience of administrative burden was more common for native Dutch participants (compared with participants with a migration background). Unemployed hardly suffered from administrative burden because a professional took care of the application and administration of their benefits, and their eligibility was relatively stable.

Stigma and shame

The literature often mentions stigma and shame as a reason for foregoing benefits. Very few participants, however, reported stigma or shame as an inhibitor of welfare participation. Many participants explicitly mentioned that shame played no role in participating in a national benefits program for which one is eligible. Some participants indicated that they could imagine someone being ashamed to apply for benefits, but no participant reported feeling shame about welfare participation themselves. Their rationale was that national benefits are broadly used, and employed citizens are also eligible. Stigma and shame seemed to play a more prominent role in other welfare programs, for example, unemployment benefits and the Food Bank. This was especially the case for native Dutch participants. For example, one young woman said:

> "[..] requesting unemployment benefits feels like a shortcoming. It should not be necessary. You should be able to earn your own money, be self-reliant. And not feel like not being capable of something normal."

Other inhibitors

Participants mentioned several other potential inhibitors for claiming welfare. For example, some participants experienced a lack of freedom when participating in a welfare program. Others mentioned the pressure to meet the eligibility criteria; this applied to local rather than national benefits. On some occasions, language barriers and digital illiteracy played a role, especially for those who did not get support from a professional or a relative. Some thought they were ineligible for benefits. We could not check whether this was the case. Based on our best estimate, the perception was correct in some instances and wrong in others. In any case, perceived eligibility did not seem to be a significant threshold for benefits in our sample. Finally, two participants indicated they were fundamentally against using benefits because they disagreed with government policy, specifically regarding COVID-19.

Getting help

We asked participants where they went for help on financial matters. Friends and relatives were most often mentioned as a source of help. Quite a few participants got help from a professional, such as a curator (in the case of unemployment or overindebtedness) or a bookkeeper (for self-employed participants). Others got help from the local government, especially in Eindhoven. A considerable number of participants mentioned *We Eindhoven* as a source of help. *We Eindhoven* is an initiative of the municipality that offers inhabitants who temporarily need support to get a grip on their life. Some of the participants also provided financial help themselves, either as a professional, relative, or friend.

Participants also mentioned barriers to seeking help. Many had had bad experiences seeking help from the government in the past. They did not get the help when they needed it. Some mentioned that they had to overcome shame to seek help, but that did not stop them from asking. A few participants did not know where to go for help.

Differences between the two locations

Although the general findings apply to both locations, we noticed some differences. Negative associations with money, including stress, were more common in our interviews in The Hague, whereas neutral and ambiguous associations were more common in our interviews in Eindhoven. This coincided with the finding that more participants in The Hague had difficulties making ends meet and negative experiences with borrowing and debts. The

fear of reclaims was also more prominent for participants from The Hague. Participants in Eindhoven found the application easier than participants from The Hague. No participants mentioned the local service point in the Hague; in Eindhoven, many participants knew the local service point (*We Eindhoven*).

DISCUSSION

We interviewed 31 financially vulnerable people about their experiences with welfare participation. We examined money's role in their lives, the inhibitors they experienced for taking up benefits, and where they went for help if needed. We held semi-structured interviews, which gave us more in-depth and contextual data than quantitative studies. Also, we show the experiences of a group that often does not participate in quantitative studies. Using inductive and deductive analysis, we built on the existing literature, allowing themes to emerge spontaneously. Although the participants and the interviewers had very different backgrounds, we sensed trust and an open atmosphere; participants shared intimate details of their personal lives.

Participants often had negative thoughts and feelings about financial matters. Money gave them stress and worries. For many participants, the absence of stress was their ideal. For some, money was associated with freedom and doing nice things. Many had difficulties making ends meet. Participants had negative attitudes towards debt.

For financially vulnerable individuals – especially those with low, fluctuating incomes – the fear of reclaims was strongly related to welfare participation. Many had experienced reclaims, and fear of reclaims was the most common reason for not applying for national benefits. To our surprise, participants rarely mentioned the scandal with childcare benefits. Despite its broad media coverage, the benefits scandal did not play a prominent role in participants' decision to take up benefits. A few participants mentioned the scandal, but it had not affected their behavior. Participants' experiences were more important in taking up benefits than what they read in the media.

Participants experienced benefits as a loan from the tax administration. With advance payments based on an estimate of future income, the current benefits system seems to increase rather than decrease financial security for financially vulnerable households. This runs counter to the intention of social welfare. In line with these findings, financially vulnerable households tended to have a negative attitude towards the government, including the tax administration. Participants had experienced the government not helping them when they needed help and had made mistakes that resulted in unexpected reclaims. These reclaims had caused financial worries.

Stigma and shame were not often mentioned for national benefits but seemed more prominent for local benefits. This difference is most likely related to national benefits being available for a broad population group, including those with jobs. Local benefits, in contrast, are associated with being unemployed and unable to take care of oneself. Participants often mentioned administrative burden and fuss. For national benefits, this was not related to the application process but to continuously needing to be alerted to administer changes in their situations to prevent reclaims. Participants reported pressure to meet the eligibility criteria for local benefits and the humiliation associated with disclosure. These aspects did not seem to play a role in national benefits.

Some groups readily had access to professional help, such as the unemployed and the overindebted, migrants and people with a broad social network, and self-employed who could afford a bookkeeper. But those without such a safety net had an additional financial vulnerability and an increased risk of non-take-up. Examples included financially vulnerable entrepreneurs and divorced women.

There were notable differences between the two locations. We offer two potential explanations. First, the location in The Hague, a local street market in a poor neighborhood, may have attracted more financially vulnerable citizens. The location in Eindhoven, the city center, likely attracted a broader audience. Although we recruited people who had experienced difficulties making ends meet, our sample included more financially vulnerable citizens in The Hague, such as unemployed and low-income self-employed individuals. In Eindhoven, relatively more participants were employed. Second, the strong position of *We Eindhoven* as an organization that helps people get a (financial) grip may have contributed to decreasing the financial distress of the financially vulnerable.

The findings in this article give insights into the lived experiences of an important target group for social welfare that can guide policy and future research. The findings of our study underscore that policymakers must develop welfare systems with the target population – usually the financially vulnerable – in mind. Rather than basing assumptions of research and policy only on professional respondents, it is worthwhile to invest the effort to collect the perspectives and experiences of financially vulnerable groups themselves.

A specific finding for the Dutch benefits system is that advanced payment mechanisms do not work well. It was explicitly intended to help the financially vulnerable, but it may be counterproductive. Only one participant was aware

of the possibility of requesting benefits retrospectively. For many others, it had resulted in reclaims. Policymakers could consider turning the default around to address this problem by using last year's income to apply for this year's benefits and creating a safety net for those whose income suddenly decreases. Such a policy change may positively affect trust in government and tax administration. Future studies should confirm this presumption.

Our study shows that a lack of trust in government institutions inhibits welfare participation. Increasing trust in government and tax administration may contribute to welfare participation. Citizen-centered welfare policies are one potential way of achieving this[56]. For example, using "local helpers," either by stimulating informal support or creating an easily accessible professional support facility, may be a viable way to increase trust and welfare participation. Those closer to the financially vulnerable have a bigger chance of increasing the confidence of this group in their right to help them overcome the stress of potential reclaims. They can assist them in monitoring their financial situation and informing the tax administration about changes, thus decreasing the administrative burden of welfare participation.

Future studies could examine interventions using the findings of this article. For example, experiments to reduce the (fear of) reclaims could give valuable insights. One way of achieving this is to stimulate retroactive benefits application. Another could be to make updating personal information easier for welfare recipients. In the interviews for this study, we found that fear of reclaims and trust in government institutions inhibit financially vulnerable citizens from participating in welfare participation. To increase the generalizability of these results, it would be worthwhile to test them in quantitative studies. Finally, extending the research to welfare participants in other countries would be valuable.

We hope that the current study reminds policymakers of the importance of considering the challenging circumstances of financially vulnerable households when designing welfare policies. This is essential if welfare policies are to achieve their goal: to provide security to the financially vulnerable.

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CHAPTER 5. APPENDIX
INCOME SUPPORT WITHIN THE DUTCH WELFARE SYSTEM

National Income Support Programs

Healthcare benefits (HA, *zorgtoeslag*)[1] is a means-tested benefit that supports financially vulnerable families paying for their mandatory health insurance. Individuals aged 18 or more are eligible when using health insurance in the Netherlands, paying the premium, and meeting the income and asset thresholds.

Financially vulnerable households renting an independent living space with a formal renting contract can apply for rent benefits (RB, *huurtoeslag*)[2]. Eligibility criteria include age (minimum 18), income, assets, and age-dependent rent thresholds. Furthermore, one needs to be registered with the municipality at the living address and pay the rent. Special rules apply if a household member receives care at home if a household has more than eight persons, if someone registered at the home address lives in a psychiatric hospital, nursing home, or detention, or if someone lives in an adapted house because of a handicap.

Child benefits (CB, *kindgebonden budget*) cover children's clothing, food, and school expenses for financially vulnerable households[3]. The program aims at families with children under 18 (including stepchildren, foster children, and adopted children), meeting income and asset criteria, and receiving a general child allowance (GCA, *kinderbijslag*). The income threshold depends on the number of children and their ages. Parents who do not receive GCA for a 16- or 17-old who does not receive a student's grant, whom they support financially (meaning that they pay at least € 425 per quarter), are eligible. In case of a divorce, the parent who receives GCA also receives CB. In the case of two parents that both have children from a previous relationship for which they receive GCA, only one of the parents receives CB. When a household receives one of the other three benefits, CB is provided automatically in case of eligibility.

Locally administered provisions

Municipalities provide social assistance (SA, *bijstand*) to those unable to obtain sufficient income and insufficient assets. Special Social Assistance (SSA, *bijzondere bijstand*) offers reimbursement for unforeseen necessary expenditures to poor households that they cannot cover in another way. Individual Income Support (IIS, *individuele inkomenstoeslag*) supports those who suffer prolonged

poverty (three to five years in most municipalities). Also, cities offer collective health care insurance (CHCI, *collectieve zorgverzekering*). Typically, the city pays part of the premium or the excess deductible, and the insurance provides additional coverage. Many municipalities offer a city pass (CP, *stadspas*) that enables financially vulnerable households to participate in cultural, social and sports activities. Food Banks (*Voedselbanken*) provide free food packages for households around or below the Dutch poverty line[b]. Local governments provide a range of other provisions, often allowing financially vulnerable families to participate in social activities. Finally, local and regional governments can waive local and provincial taxes for poor households[4].

The benefits scandal

The benefits scandal (also known as the childcare allowance affair or allowances scandal) is a Dutch political affair resulting from unjustified fraud suspicions with childcare allowances and the strict recoveries in case of errors. According to investigative committees, the working methods of the Tax and Customs Administration were unlawful, discriminatory and improper, and there was institutional bias and violation of the fundamental principles of the rule of law. As of 2017, the scandal has gained increased attention in politics and media. The third cabinet of prime minister Rutte fell on 15 January 2021 as a response to a critical report about the scandal.

The problems with the (childcare) allowances created a unique situation. A parliamentary interrogation committee found that there is unprecedented injustice and that the fundamental principles of the rule of law have been

b In the definition of Social and Cultural Planning Office of the Netherlands (SCP), people are poor when they do not have the means to obtain the goods and services that are considered minimally. People are poor when, for a prolonged period, they do not have the means for the goods and facilities that are considered the minimum necessary in their society. In this definition, someone is considered poor, for example, when he or she has insufficient income for food or a good house. SCP bases the poverty line on a list of minimally necessary goods and services, with the accompanying prices. There are two reference budgets. The strict “basic needs” budget comprises the minimum expenditure of an independent household on unavoidable, basic items such as food, clothin.g and housing. Spending on other hard-to-avoid items, such as insurance and personal care, is also included. The “modest-but-sufficient” budget is slightly wider. That budget also takes into account the minimal costs of relaxation and social participation. Think of membership of a sports or hobby club or an annual short vacation.In 2017, the basic needs budget for a single person living alone was €1,039 per month and the modest-but-sufficient budget was €1,135 per month

violated. A large group of parents and children have run into serious problems at the hands of the government. The State Secretary for Allowances and Customs writes about this to the House of Representatives:

> *"The injustice done to parents and children by the problems with allowances is indescribable for many. The lack of trust by the government, the lack of opportunities to obtain justice and the incalculable recoveries have led to terrible suffering for many parents and their children."*

Many families have a cascading of problems. A large proportion of parents still experience (very) serious problems in the field of well-being (40%), money matters (33%), home situation (30%), work or education (27%), living situation (25% or family and friends (23%). One in three parents has (very) major problems in at least four areas. 62% have very little to no trust in the government. People don't feel heard when they got stuck in the system. They were also not heard in court.

The recovery operation for the problems with surcharges is also unprecedented, both in nature and in size. So far, more than 50,000 parents have reported as victims (ultimo 2021).

Table A1. Overview of available non-take-up rates (and numbers of eligible individuals/ households) for national and local programs in the Netherlands.

Programs	**Non-take up % (# individuals/households)**
National Programs †	
Health Care Benefits	16% (> 800.000)
Rent Benefits	10% (140.000 – 150.000)
Child Support Benefits	15% (120.000 – 130.000)
Local Programs ‡	
Individual Income Benefit	2% – 25%
Collective Health Care	40% - 48%
City Pass	7% - 25%
Tax Waiver	14% - 25%

† The estimates of non-take-up of national provisions come from two studies. According to Berkthout et al. (5), the average non-take-up of child benefits was fifteen percent (between 120.000 and 130.000 households) in the years 2014 through 2016. In the same study, they calculate that ten percent of eligible households did not claim rent benefits in those years, amounting to between 140.000 and 150.000 households. In 2008, one in six eligible families did not claim HA, which amounts to over 800,000 families[6].

‡ Few studies examine the magnitude of the underuse of locally administered benefits. The available data come from four larger cities in the Netherlands[7-10]. Local governments usually measure take-up as the percentage of financially vulnerable households that use a certain benefit (without taking other eligibility criteria into account).

INTERVIEW GUIDE AND CODING SCHEME

Interview preparation

Preparation / materials

- Laptop + loader
- Phone with a dictaphone app
- Informed consent forms
- Printed interview guides

Background

Research questions

How do financially vulnerable households experience being eligible for welfare, how does this affect their financial and overall well-being, and where do they turn for help when needed?

Target group

- People between 18 and 67 eligible for benefits.

Interview setup

The interview setup is roughly as follows:

- Getting acquainted (putting it at ease, telling the purpose of the research, possibly filtering out people who are not eligible for benefits).
- Money experiences (thoughts and feelings about money, experience with borrowing/debt, money worries/money stress).
- Thresholds for benefits use (experiences with benefits, knowledge/skills, attitudes, necessity).

Selection questions (recruiter)

The goal of the selection questions is to determine if someone is (potentially) eligible for the three main benefits for low-income households. See the criteria in paragraph 6. At least part of the sample should be eligible but not take up benefits. We aim for a diverse sample (without aiming for representativity).

- We are working on a study for Leiden University, and we would like real stories of people who know what life looks like.
- We would like to know how to make ends meet with a small budget. Is that something you have experience with?
- We hold anonymous interviews to learn from people like you. Would you be willing to participate?
- If yes: to the table!
- Would you like some coffee or tea?

The interview

Selection questions at the table

The goal is to quickly determine if someone is eligible for at least one of the benefits. The income threshold for health care benefits is at € 31.138 (€ 39.979 for couples). This amounts to approximately € 2.159 (€ 2.567) net per month. There are no formal thresholds for the other two benefits, but the amount you get becomes lower as income increases. The capital threshold is relatively high (more than € 100.000). In practice, few households fail eligibility criteria because of their capital.

- We are going to talk about making ends meet on a small budget. Before we start, I have some questions to determine what we can and cannot talk about.
- Can I ask your age?
- And do you live alone or with others?
- Do you have children younger than 18? And to you receive child benefits?
- Do you rent, or do you own a house?
- Can I ask what kind of work you do?
- I have a bold question: can you tell us approximately your net monthly income?

If income exceeds the threshold, you explain to them the purpose of the study and say goodbye in a friendly way.

Briefing

Introduction

I am [..], and [..] years old. We are doing a study for Leiden University on how people make ends meet on a small budget. We want to see how we can better support people who have a low income. Your experiences are vital. So we would like to hear from you what money means to you and how you deal with it. We are having a normal conversation. I ask questions, and you say what comes to mind. There are no right or wrong anwers because we're looking for opinions and experiences. So you are always right.

Privacy

I'm recording this conversation. I only use it for myself to listen to it again. I am also making a report of this investigation. If it says something you said, no one will know that you said it. My colleague listens in and notes so that I don't have to write so much myself. It's completely anonymous. That means that your name or phone number or whatever will not appear on it anywhere. Your data will only be used for this research.

Consent

Here is a note that explains this all. You can take that with you afterwards. It also states what to do if you have any questions afterwards. Is everything clear? And do you agree?

Personal situation

Purpose: To put the interviewee at ease and get them into "talking mode."

First of all, I would like to ask you to say something about yourself.

- What are your daily activities (what do you do during the day)?

Optional questions:
- *Do you work for a boss (in paid employment), or are you self-employed?*
- *Do you have a permanent or temporary employment contract?*
- *And your income? Is that about the same every month, or does that differ?*

- How do you live (alone, with someone, with children)?
- And how old are you?

I want to know a little more about your financial situation. Do you want to tell us something about that?
- How much do you get per month on your account?
- And do you also have savings? How many?
- Do you receive child benefits?
- Do you have a house for sale or a rental house?
- How much rent do you pay per month (including service costs) if a rental house?

Meaning of money

Goal: To determine what role money plays in the interviewee's life. Special attention to:
- difficulty making ends meet
- money worries/money stress
- experience with borrowing/debts

(but also attention to the positive experiences)

First associations money
- What do you spontaneously think of when I say 'money'? Everything you think is good; I'm just curious: what do you think of when you hear the word money?

  Additional/in-depth questions:
  - *What feeling do you have when you talk about money?*
  - *Is that more of a positive or negative feeling? Explain.*

Make ends meet

- You indicated that you [name work/occupation]. Can you indicate what you can and can't pay for?

  Possibly give examples:
  - *Mortgage or rent*
  - *Gas bill*
  - *Groceries*
  - *Gifts for the children*
  - *Holidays and other fun things*

- Do you often have money left at the end of the month? Or are you short of money?
- What's your take on that?
- And how do you deal with it?

  Follow-up questions:
  - *Has it ever happened that it didn't work out?*
  - *Can you tell us exactly how that went back then?*
  - *What did you do then?*
  - *And what did that do to you?*

  Nice to know: changes due to *Corona crisis (less work/income); or other causes (new job; etc.)*
  - *Has it changed lately?*
  - *Has it become harder/easier* to make ends *meet?*

- Do you ever have to deal with an unexpected expense?

  Follow-up questions
  - *Can you give an example of that?*
  - *Do you have money for this?*
  - *If not, how do you deal with that?*
  - *Can you tell us a little bit more about that?*

Borrowing

- Have you ever borrowed money?
- What was that for?
- What kind of loan was that?

- How did that go with paying the interest and repayment? Was that difficult/ easy?
- What is it like for you to borrow money?

Money worries now or past

- Do you ever have concerns about money or money matters? Or have you ever had that?
- Could you tell us a little bit more about that? What are you (or were) worried about?
- What caused you (or did you have then) money worries? Tell.
- Take me into that situation: what was that like for you?

  Follow-up questions:
  - *Can you give an example of that?*
  - *Do you have money for this?*
  - *Did it also cause stress?*
  - *Can you describe that?*

Earning extra income

Purpose: to determine people's experiences with benefitss and possibly other facilities. Special attention to possible thresholds. Known thresholds from the literature include:

- unfamiliarity
- one thinks one has no right to it
- too difficult and no confidence to be able to do it
- no help with applying
- the need is lacking (it delivers too little)
- shame / stigma
- fear of having to pay back

Note: it could be that you hear things that are not according to the rules (think of undeclared work). These are things that you do want to hear and that you want to ask questions about. As an interviewer, you have no right to non-disclosure. But because you don't know the person's name, the risk for the interviewer and interviewee is nil.

Knowledge

- Have you ever thought about ways to get extra money?
- If so, which ones?
- What (other) ways do you know to get money from the government?
- Have you ever heard of benefits?
- What benefits do you know?
- Have you ever used it? Or are you using it now?

If they have not received any benefits, please go to 4.5.3. Otherwise to 4.5.2

Experiences with the use of benefits

- What benefits do you use?
- How did the application work?
- What is it easy or difficult to apply?
- What did you have to do for it? Take me through how that went?
- How does it make you feel to apply for benefitss?
- Once you have applied for benefits, do you still have to do something for them afterwards? What?
- How do other people view the fact that you use benefits?
- Is there still a difference between rent benefits, care benefits and child-related budget?

Thresholds for use

It is essential to estimate which benefits one is entitled to for the following questions.

See criteria in section 6. In the first instance, choose one surcharge that you will go deeper into.

The following order is given below. Depending on which benefits someone does or does not use, you can skip one or more

1. Health care benefits
2. Rent benefits
3. Child support benefits

- What is the reason that you do not use a health care benefits now?
- Can you tell us more about it?

  Follow-up questions (if someone indicates that they think they are not entitled to it)
  - *Why do you think you are not entitled to benefitss?*
  - *Can you tell us a little bit more about that?*

  [It may be that someone falls into an exception group. If not, you can tell them that we think they are entitled]
  - *How do you feel about hearing that you do have a right?*

- Are there any other reasons you do not use a health care benefits?
- What do you think about other people applying for a health care benefits?
- How is that for child support benefits?
- And how is that with rent benefits?
- Can you tell us more about that?
- I want to tell you a story I've heard. And I want to ask you to empathize with this person. And I'm curious how you look at this situation with your experience and why you think this person makes these choices.

  "[Name of male/female](name a few background characteristics of the person, which match those of the respondent). He (or she) has been struggling to pay his bills for some time. Last week he received a letter that he still had to pay his *rent. The housing corporation* calls and offers a payment *arrangement. In the end, the person on the line tells him that he* can also apply for rent *benefits. [Name] hangs up the phone. He thinks about requesting rent benefits but ultimately decides not to."*

- What reasons could [Name] have for not going into this?
- Is this a situation you recognize? How then? What prevents him from knocking on the door of the municipality?
- Would it be any different if we weren't talking about [Name], but about Peter? Or about Ahmed? Could there be other reasons for not knocking on the door for benefits?
- Suppose you had received a phone call from the housing corporation: Had you applied for rent benefits? Why or why not? What would have caused you to do that?

Get help

- Do you ever talk to someone about money matters?
- And about applying for benefitss or other facilities?
- With whom?
- If you can't find a way out of something or if something doesn't work out, who do you ask for help?

  Follow-up questions
  - *What's that like for you to ask for help?*
  - *Can you give an example of that?*
  - *What was that like for you?*
  - *Do you know any other people or places where you could ask for help?*
  - *Have you ever done that?*
  - *If so, how did it go? And what did you think?*
  - *If not, why not? What would it take to ask for help?*

Debriefing

Purpose: Evaluate interview (see if there is the aftercare for the interviewee and if adjustments to the script are needed).

Those were all the questions I wanted to ask. Thank you for sharing your experiences. That is very important for our research. This allows us to better help people entitled to benefitss and other facilities.

- How was it for you to make this conversation?
- Before we close this interview, is there anything else you'd like to say?

Provide information form

Criteria for benefits in short

Health care benefits

https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/prive/toeslagen/zorgtoeslag/voorwaarden/voorwaarden-zorgtoeslag

- Minimum age 18 years.
- In possession of health insurance (but this is mandatory).
- Dutch nationality or legal in the Netherlands.
- Income up to € 31,138 (€ 39,979 for people with a supplement partner).
- Capital up to € 118,479 (€ 149,819 for supplement partners).

Special circumstances:

- People who have a supplement partner younger than 18 years (but are 18 years older) are entitled to half of the care benefits that usually applies. The income of the partner does count.
- People in military service, in prison, mood objectors and international students who work here are not entitled to health care benefits.
- In some cases, people living in another EU country are entitled to health care benefits.

https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/prive/toeslagen/zorgtoeslag/voorwaarden/zorgtoeslag-als-u-in-het-buitenland-woont).

People who live abroad who have compulsory health insurance in the Netherlands are entitled to health care benefits.

Dutch people who work abroad are usually not eligible for health care benefits because they do not have health insurance in the Netherlands.

People living abroad who have mandatory health insurance in the Netherlands are eligible for healthcare benefits.

Dutch residents who work abroad are generally not eligible for healthcare benefits because they don't have health insurance in the Netherlands.

Rent benefits

https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/prive/toeslagen/huurtoeslag/huurtoeslag

- No maximum income (but if the income is high, it may be that the right is 0).
- Power maximum € 30. 846 per benefits partner / co-resident
- Minimum age 18 years.
- Dutch nationality or legal in the Netherlands.
- Maximum rent, including service costs, is € 432.51 for people between 18 and 23 and € 737.14 if one of the cohabiting parents is then 23 or if a child lives in the same house.
- Rents an independent living space, has a rental contract and pays the rent.

Special circumstances:

- People under the age of 18 are entitled to rent benefits if they are orphans or have children.
- In the case of divorced parents, the children are co-residents for both parents. This can affect entitlement to rent benefits.
- If someone in the household receives home care, the income and assets of one person are not counted.
- For households > 8 people, a higher limit for rent benefits applies.
- If someone from the household lives in a psychiatric hospital or prison, this person no longer counts for rent benefits.
- If you live in an adapted home because of a disability, you can also receive a rent benefits if the rent is higher than the maximum.

Child support benefits

https://www.belastingdienst.nl/wps/wcm/connect/bldcontentnl/belastingdienst/prive/toeslagen/kindgebonden-budget/voorwaarden/voorwaarden-kindgebonden-budget

- Has children under 18 (including stepchildren, foster children and adopted children.
- Receives child benefit.
- There is no maximum income (but with a higher income, the right can be 0).
- Dutch nationality or valid residence permit.
- Capital up to € 118,479 (€ 149,819 for supplement partners).

Special circumstances:
A calculation is made to determine how high the amount is. This depends on the income and the number and age of the children. In practice, everyone entitled to rent or care benefits is also eligible for a child-related budget (provided they receive child benefit).

- People who do not receive child benefit for a child aged 16/17 who does not receive a study grant and who maintain the child (that means that they have lost at least € 425 per month) are entitled.
- In the case of divorced parents, one of the parents receives a child-related budget (namely, the parent who receives the child benefit)
- For couples who both have children from a previous relationship, only one receives a child-related budget.
- People outside the Netherlands receive a child-related budget if they meet the other criteria.

Benefits partners
If people are benefits partners, the income and assets of both partners count together to determine their entitlement to benefitss. This only applies if you are a supplement partner throughout the year. People are benefits partners if they are married or have a registered partnership. Cohabitants are also an benefits partner if one of the following conditions applies:

- Were benefits partners last year
- Have a cohabitation contract
- Are tax partners
- Are partners in for the pension scheme
- They – or one of their fellow residents – have a child under the age of 18, except if:
    - One of the co-residents is the parent of the other and is younger than 27
    - There are three co-residents older than 18 years.

CODING SCHEME

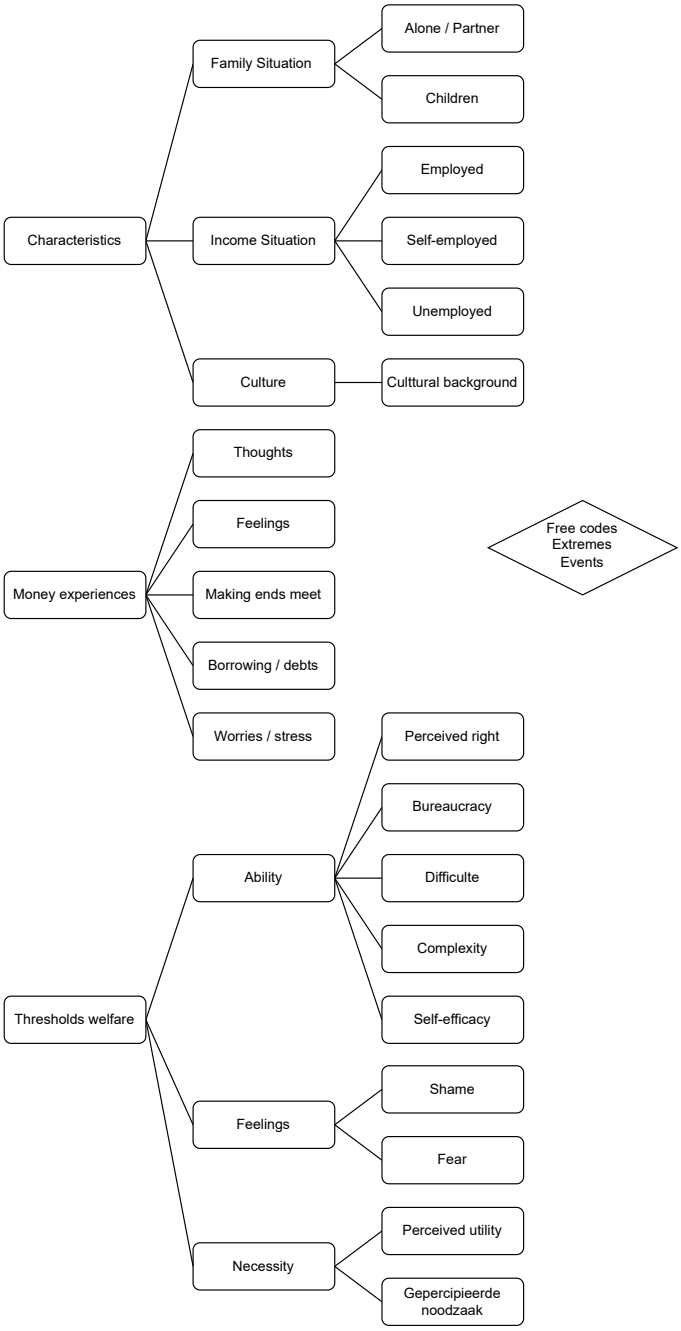

Figure A1. Coding scheme

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Chapter 6

Psychological barriers to take-up of healthcare and child support benefits in the Netherlands

Based on:
Simonse, O., Knoef, M., Van Dillen, L. F., Van Dijk, W. W. & Van Dijk, E. Psychological barriers to take-up of health care benefits and child support benefits in the Netherlands. *Journal of European Social Policy* **33**, 353–372 (2023). *https://doi.org/10.1177/09589287231164343*

ABSTRACT

We empirically test an integral model for healthcare and child support benefits take-up using a probability sample of the Dutch population (N = 905). To examine how different psychological factors, in conjunction, explain take-up, we apply model averaging with Akaike's Information Criterion (AIC_C). People's perceptions of eligibility best explain take-up for both types of benefits. For healthcare benefits, take-up also relates to perceptions of need. Exploratory analyses suggest that for healthcare benefits but not for child support benefits, executive functions, self-efficacy, fear of reclaims, financial stress, and welfare stigma explain perceived eligibility. We find no support for knowledge, support, and administrative burden as explanatory factors in take-up. We discuss the results in relation to the Capability Opportunity Motivation Behavior (COM-B) model for developing behavioral change interventions.

INTRODUCTION

Social welfare provides income security for financially vulnerable households and can counteract financial distress. Many eligible families, however, do not claim social welfare. Non-take-up rates vary between countries and programs, but 30 to 40% rates are not exceptional[1–3]. From a policy perspective, this implies that social welfare systems are not fully achieving their goals, which may undermine their legitimacy[4]. For eligible households, not claiming social welfare negatively affects their current well-being. Moreover, it affects their future well-being, as the non-take-up of welfare hampers saving for rainy days and investing in the future. Thus, the non-take-up of social welfare may exacerbate financial distress and contribute to poverty traps[5].

To develop effective interventions to increase take-up, it is essential first to identify which factors contribute most strongly to the observed non-take-up. The study of welfare participation started almost a century ago. Yet, until this day, empirical evidence is fragmented, and most studies examine a limited set of potential inhibitors. Scholars in the domains of social policy and public administration initially studied welfare participation. Early social policy literature on the take-up of welfare assigned a prominent role to welfare stigma[6,7]. Later studies provided a more integrative view of welfare participation. They included the influence on benefits take-up of perceived eligibility, perceived need, knowledge, attitudes towards and expectations of the application procedure, and perceived stability[8–11]. Standard economic models predict that households participate in welfare programs if the benefits outweigh the costs[12–15].

In the last two decades, behavioral insights have contributed significantly to the welfare participation literature. In public administration, scholars have realised that administrative burden, defined as "an individual's experience of policy implementation as onerous," looms larger for citizens with lower levels of human capital[16–18]. Also, they have pointed out the executive functions' potential role in inhibiting take-up[19,20]. Behavioral economists have developed interventions to increase welfare participation, thereby deepening the understanding of welfare participation's psychological inhibitors and promotors[21–27]. Important findings are that increasing the salience of households' eligibility for welfare and simplifying application processes can increase take-up. Studies like these have added significantly to the understanding of non-take-up by adding behavioral insights, but only included a limited number of potential promotors and inhibitors of welfare participation.

The current study integrates theoretical and empirical economics, public administration, and psychology findings into one model. It tests how different psychological factors, in conjunction, explain welfare take-up for two national Dutch benefits programs: healthcare and child support benefits. It adds to the existing literature by identifying the relative strengths of different promotors and inhibitors of welfare participation, which may help design possible interventions. The remainder of this article is organized as follows. We first give an overview of the explanatory factors for take-up in our model based on the literature. Next, we describe our methodological approach and present the results. Finally, we conclude and provide suggestions for policy and future research.

FACTORS PROMOTING AND INHIBITING TAKE-UP

We use the COM-B framework designed by Michie et al.[28] as a conceptual framework to organize promoting and inhibiting factors from the literature on welfare participation. This model is explicitly designed to understand behavior and identify possible routes to promote behavior change and interventions. The COM-B model identifies three groups of factors that need to be present for any behavior to occur: capability, opportunity, and motivation (see Figure 1). In the following, we apply this framework to organize the driving factors contributing to household welfare take-up behavior. Combining potential promotors and inhibitors into one model allows us to empirically test these factors' relative strengths.

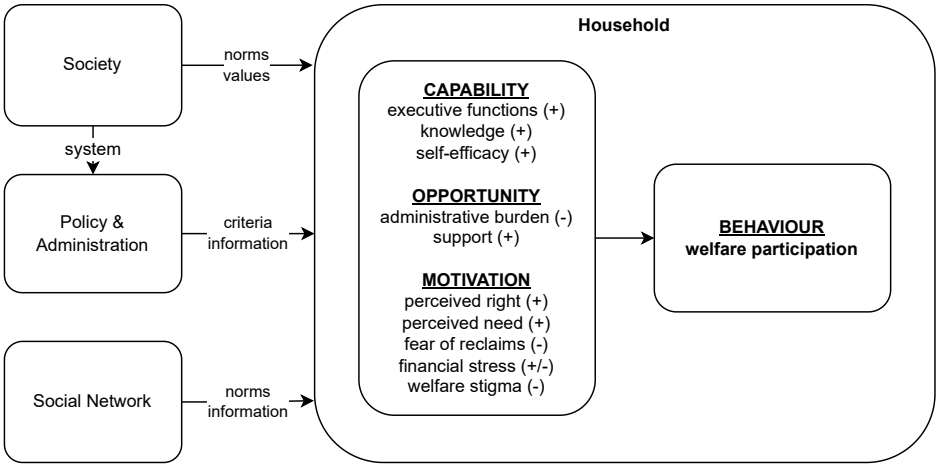

Figure 1. Conceptual model: factors promoting (+) and inhibiting (-) welfare participation

In line with the COM-B model, our framework is dynamic and recursive. Households eligible for welfare go through an application process that consumes time. We propose that households are passively eligible (i) until the occurrence of some trigger. Van Oorschot[11] describes triggers as "Sudden events which have the power of inducing claims quickly" (p. 78). Examples include substantial income drops, direct advice, and encouragement to eligible people in personal contact. After a trigger, households go through an orientation (ii) and an application stage (iii). When the administration refuses the application, households may go through an appeal stage (iv). Finally, households must provide updates on their circumstances that affect their eligibility to the welfare administration (v). Households can thus move back and forth between these five stages. At each stage, different factors may promote and inhibit proceeding to the next stage.

The current study focuses on the behavior of individual households. This behavior, however, crucially depends on the context in which they operate. Society, welfare policy and administration, social networks, and individual households collectively determine the outcomes of the welfare system. Society influences welfare behavior by establishing eligibility rules that may, in turn, affect welfare participation[11,29,30]. A second way society influences welfare participation is through values and norms. In societies that regard welfare negatively, eligible households may experience more welfare stigma and feel less deserving than those with a more positive view of welfare[31]. Welfare policy may also affect the behaviors of street-level administrators that promote or inhibit take-up by eligible households[32,33]. Social networks may influence the norms surrounding welfare participation and thereby affect stigma. Also, social networks can provide information on programs and assistance in the application procedure[34–36].

Capability factors

Michie et al.[28] define capability as "the physical and psychological capacity to engage in the behavior." (p. 4). Based on the take-up literature, we propose that capability includes executive functions, knowledge, self-efficacy, and financial stress.

Executive functions refer to a family of top-down mental processes needed when you have to concentrate and pay attention when relying on automatic tendencies or intuition would be ill-advised, insufficient, or impossible[37]. Executive functions consist of working memory, inhibitory control, and cognitive flexibility. Research on the potential role of executive functions in welfare participation is relatively new and results from applying psychology to public administration research. Christensen et al.[20] proposed that executive functions are essential in non-take-up. They argued that those needing assistance might lack the "cognitive resources required to negotiate the burdens they encounter while seeking such assistance." This theoretical notion still lacks empirical support.

Knowledge. Early public administration frameworks included knowledge of a welfare program as a threshold eligible households had to pass before deciding to claim[9–11]. The rationale is that eligible households need to know that a program exists and understand its main characteristics to participate. Recent empirical evidence indicates that pointing households to their eligibility for welfare may increase take-up, although the evidence is mixed. For example, Finkelstein and Notowidigdo[38] demonstrated in a large-scale American

food stamp program (SNAP) experiment that sending eligible, non-claiming households a mail and a reminder postcard increased take-up. In another experiment, Bhargava and Manoli[21] sent reminders to people who had been asked to request earned income tax credit (EITC) but had not done so. The letters resulted in a 22% increase in applications. However, Linos et al.[39] found that behaviorally informed messages to non-claimants of EITC did not increase take-up.

Self-efficacy refers to an individual's belief in one's capacity to execute behaviors necessary to produce specific performance attainments[40,41]. Self-efficacy influences financial behaviors, such as saving, investing, and borrowing[42–44]. Self-efficacy may also affect welfare participation. To our knowledge, no studies have examined this relationship.

Financial stress is the subjective feeling of having too few financial resources. The experience of financial stress occurs when pressing financial concerns are appraised as exceeding available resources that, in turn, evoke worry, rumination, and a short-term focus[45]. Financial stress is associated with different aspects of one's objective economic situation, such as low income, debts, and the absence of savings[46–48]. Mullainathan and Shafir[49] proposed that financial stress causes tunnel vision; it draws attention towards the instant issue of making ends meet and away from other issues. This tunnel vision impairs different aspects of executive functions[50–53]. Also, financial stress is associated with avoiding financial information[54]. It seems plausible that financial stress inhibits welfare take-up because this involves processing complex information, problem-solving, and perseverance.

On the other hand, a high level of financial stress could be associated with a higher degree of need for welfare and a higher degree of perceived eligibility and, therefore, be associated with a higher probability of benefits take-up. We are unaware of studies that empirically attempted to establish the role of financial stress in welfare participation. This line of investigation, therefore, deserves further attention.

Opportunity factors

Opportunity entails "all the factors outside the individual that make the behavior possible or prompt it."[28] (p. 4) We propose that households' opportunity to take up benefits depends negatively on administrative burden and positively on support.

Administrative burden is "an individual's experience of policy implementation as onerous"[16] (p. S69). There is ample evidence that administrative burden affects vulnerable groups more than others[17,18,55]. Experimental evidence confirms that decreasing administrative burden can increase take-up. For example, Fox, Stazyk, and Feng[56] found that reducing administrative burden increased the take-up of Medicaid. Bhargava and Manoli[21] found that simplifying the reminder letters greatly affected take-up (23%, compared to 14% in the control group).

Support. Several studies have demonstrated that professional or social network assistance and support may promote welfare participation. In a small-scale field experiment, interviewers answered questions of households eligible for food stamps. This intervention increased participation rates compared to the control group[57]. Finkelstein and Notowidigdo[25] found that providing assistance and sending reminders increased take-up from 11% to 19%. Other studies have found that support from social networks may also increase take-up[34,36,58].

Motivational factors

Motivation involves "all those brain processes that energize and direct behavior [...]. It includes habitual processes, emotional responses, and analytical decision-making"[28] (p. 4). We propose that households' motivation to participate in welfare programs relates positively to perceived eligibility and perceived need and negatively to fear of reclaims, financial stress, and welfare stigma.

Perceived eligibility. Public administration literature often mentions perceived eligibility as a threshold for welfare participation[9,10]. According to Ritchie and Matthews[59], perceived eligibility includes "ethical, factual and emotional notions about who could and should receive the benefit"[8] (p. 548). From the finding that a relatively large proportion of non-claimants thought they were ineligible, Van Oorschot[11] concluded that perceived eligibility was a threshold for claiming.

Perceived need. Public administration and economic studies of welfare participation have consistently included perceived need or utility as a relevant factor. For example, Ritchie and Matthews[59] proposed that income adequacy - the ability to make ends meet - serves as a threshold for welfare participation. Many economic studies have found a positive correlation between the potential amount and duration of welfare and take-up. For example, Anderson and

Meyer[12] found that welfare becoming subject to income tax almost entirely explained the decrease in the take-up of unemployment insurance in the US in the 1980s. Dahan and Nisan[60] found that the welfare amount was crucial in shaping take-up rates. These findings confirm that eligible households are more likely to take up benefits as they derive more utility from doing so. In the current study, we conceptualized perceived need as the subjective assessment of a household's need to receive benefits, distinguishing it from objective factors such as income and benefits amount.

Fear of reclaims. The public administration and behavioral economics literature mentions the fear of reclaims or sanctions as a potential inhibitor of welfare participation. There is some evidence that benefits recipients may fear sanctions due to unjustly received benefits[61,62]. In a qualitative study among low-income households in the Netherlands, Simonse et al.[63] found that the fear of reclaims was the main reason respondents refrained from welfare participation. Bhargava and Manoli[21] found that attempts to reduce fear of audits had little effect. So, although there are theoretical reasons for fear of reclaims inhibiting take-up, empirical evidence is scarce, and results are ambiguous.

Welfare stigma. There is a rich literature indicating that stigma is associated with welfare participation, depending on the cultural context (e.g., the attitude towards welfare), the type of program (e.g., the generosity), and characteristics of the participants (e.g., blame, identification)[6,64]. Moffitt[14] was the first to quantify the role of stigma in inhibiting welfare participation. His economic model of welfare stigma demonstrated a negative appetite for participating in welfare programs. Currie and Grogger[65] observed that electronic benefits transfer increased the take-up of Food Stamps in the US and argued that this confirmed the role of stigma in take-up. Mood[15] posited that welfare stigma in Australia was low because take-up was high. Bhargava and Manoli[21] tested several interventions to increase the take-up of earned income tax credit (EITC) in the US and concluded that stigma played an insignificant role in EITC take-up. Wildeboer Schut and Hoff[66] concluded that stigma was relatively high but unrelated to non-take-up. In a cleverly designed lab experiment, Friedrichsen[67] provided causal evidence that social stigma inhibits take-up: participants were more reluctant to take up a redistributive transfer when claiming was publicly observable. Overall, the literature suggests that stigma may play a role in the non-take-up of social welfare. However, the difference in operationalization makes it difficult to judge how welfare stigma explains non-take-up in different contexts.

Many potential promotors and inhibitors of welfare participation have emerged from the literature. There is empirical evidence for some of these factors, whereas the evidence is mixed, unclear, or lacking for other factors. Also, most empirical studies have focused on one or a few potential promotors or inhibitors. To our knowledge, no integral empirical studies examine these factors in conjunction and within one theoretical framework. We, therefore, examine the relative contributions of different factors using the COM-B framework.

METHODOLOGICAL APPROACH

In this cross-sectional study, we surveyed participants of the Longitudinal Internet Studies on Social Sciences (LISS) panel administered by Centerdata. We administered the survey in July 2020. The panel is based on a probability sample of households drawn from the population register by Statistics Netherlands[68]. If needed, Centerdata provides households with a computer or internet connection so that vulnerable households can participate. Respondents fill in monthly questionnaires on various topics, including their economic situation. This enabled us to link eligibility for healthcare and child support benefits with our survey results. We selected respondents based on eligibility for either of the two benefits.

Dependent variables and respondent selection

We asked respondents to indicate which of the two benefits they had used in 2020 (only child support benefits, only healthcare benefits, neither, or both). Based on their responses, we could determine take-up, the dependent variable in our models.

Table 2. Healthcare benefits and child support benefits

Healthcare benefits and child support benefits in the Netherlands
Healthcare benefits (HCB, *zorgtoeslag*) are means-tested benefits that support low-income families in paying for their mandatory health insurance[69]. Individuals aged 18 or more are eligible when they use health insurance in the Netherlands, pay the premium, and meet the income and asset thresholds (on the household level).
Child support benefits (CSB, *kindgebonden budget*) cover costs such as children's clothing, food, and school expenses for low-income households[70]. The program is meant for those who have children under 18 (including stepchildren, foster children, and adopted children), meet income and asset criteria, and receive a general child allowance (GCA, *kinderbijslag*).

Table 2 contains a short description of the two benefits that are the subjects of the current study. The Appendix includes the detailed eligibility criteria for the two benefits. For healthcare benefits, we selected respondents 18 years and older with (household) incomes and assets below the eligibility thresholds. We calculated gross household income as the sum of monthly household incomes in 2020. Since healthcare insurance is mandatory in the Netherlands, we assumed all respondents had insurance and paid their premiums. The last criterion is an approximation, but the number of people not paying their health insurance premium is low (around 2%). We disregarded the special situations described in the Appendix for the same reason.

For child support benefits, we selected households with assets below the asset thresholds and for whom their children's birth years were known. Next, we calculated the eligible amounts based on income and children's ages[a]. We asked respondents whether they or their partners received a general child allowance as a final check. For respondents who indicated having a partner, we assumed their partner was also their benefits partner. This assumption holds for almost all households.

Independent variables

The survey included three multiple-choice questions to measure knowledge and Likert items (1 = *fully disagree* ... 7 = *fully agree*) to measure the other independent variables. The Appendix contains the complete questionnaire.

Capability. We measured executive functions with the twelve-item Amsterdam Executive Function Index (AEFI)[71]. Items included "I am easily distracted" and "I often react too fast. I've done or said something before it was my turn". The internal consistency is high (Cronbach's α = .84). Three multiple-choice questions measured knowledge: one on healthcare benefits, one on child support benefits, and one on benefits in general. We created two separate knowledge variables from these questions: one for healthcare benefits and one for child support benefits. Each variable included a specific question and a general question. We captured self-efficacy with three items, including "If I want, I can easily apply for benefits" and "Even if I would try hard, I don't think I would succeed in applying for benefits" (α = .80). We captured financial stress with the five-item version of the Psychological Inventory of Financial Scarcity (PIFS)[54]. Items included "I often don't have enough money" and "I feel that I have little control over my financial situation" (α = .93).

Opportunity. We measured administrative burden with a three-item scale. One example of an item was "Applying for benefits involves much hassle" (α = .91). Our support scale consisted of three items, including "If I don't succeed in applying for benefits, I know whom to turn to for help" (α = .87).

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a The eligible amount may depend on the birth date of the children. For example, if a child turns 16 during the year, the eligible amount for the second part of the year is higher than for the first part of the year. The date of birth of the children was not known. We calculated a minimum and maximum eligible amount, based on two potential birth dates (January 1st and December 31st). There were very few (4) households for which the eligibility changed depending on the chosen dates. We used the minimums in our calculations.

Motivation. We asked respondents, "I think I am eligible for ... benefits," to measure perceived eligibility. For perceived need, we asked, "Without ... benefits, it is difficult for me to make ends meet," and "... benefits are worthwhile for me". The correlations between the items for perceived need are moderate (r_s = .64 for healthcare benefits and .61 for child support benefits). We assessed fear of reclaims with three questions, including "I am worried that I have to repay benefits because of a mistake" (α = .91). We assessed welfare stigma with a tailored three-item Consciousness Scale[72,73]. One question was, "There are negative prejudices about people who use child support or healthcare benefits." The internal consistency of the welfare stigma scale is moderate (α = .74). We used the full scale in our analyses[b].

Control variables

There is substantive evidence that income, benefits amount, age, household composition, and gender may relate to the take-up of welfare[74]. We, therefore, included these variables as control variables in our analyses to eliminate alternative explanations and demonstrate the unique relationship between psychological predictors and welfare participation. Centerdata takes several measures to increase the quality of self-reported income data. Households are asked to provide their income shortly after the due date for the tax declaration. Centerdata informs households which figures from their tax declaration they should use for gross and net income. Finally, if gross income is missing, Centerdata calculates it based on net income and vice versa.

Analytical model

Because take-up for the two benefits ranged between 56% and 69%, we used a linear probability model, which is easier to interpret than a binomial model[75]. The following formula mathematically represents our model:

$$P(y_i = 1) = \alpha_i + \beta_i X_i + \eta_i, \quad (1)$$

where $i \in \{1,2\}$ represents the type of benefit ($i = 1$ refers to healthcare benefits and $i = 2$ to child support benefits); y_i is a vector of length N_i representing the take-up for the two types of benefits ($y_i \in \{0,1\}$), where 0 corresponds to non-take-up and

b As a robustness check, we repeated our main analysis using the two items with the highest correlations (r_S = .63): "People in my environment have a negative view of those who use welfare" and "There are negative prejudices about people who use benefits". Because this did not change the results, we report the results with the full scale.

1 to take-up; X_i is a matrix of size m*N_i representing the independent variables and control variables; α_i are the intercept terms for the two equations; β_i is a vector of length *m* representing the regression coefficients and η_i finally, represents a vector of length N_i of the error terms.

Multimodel inference

Using a corrected version of Akaike's Information Criterion (AICC)76,77, we applied multimodel inference based on an information-theoretical framework. Akaike's framework is well suited for model selection, especially if the purpose is to explain (rather than predict) the phenomenon under investigation[78,79]. Also, the framework guards against overfitting[80]. Overfitting increases the probability of finding spurious effects [81] and decreases generalizability[82]. The traditional approach to overfitting, stepwise regression, leads to incorrect standard errors of the parameter estimates. As a result, relevant variables may not be selected for the model, and nuisance variables may be included, which leads to incorrect inferences [83]. Regularization (or shrinkage) mechanisms such as Ridge regression, LASSO, and Elastic Net are alternatives for stepwise regression[84–86]. A flaw of regularization mechanisms is that they base inference on a "best" model and disregard model uncertainty, which leads to underestimation of the residual variance[87] and over-confident inferences[88]. Model averaging based on Akaike weights overcomes this problem[81,89,90].

RESULTS

Data inspection

The original sample contains 951 eligible respondents. We removed eight respondents from the sample who did not complete the survey. For 38 respondents, we could not determine eligibility because of missing income data. In line with Allison[91], we removed these respondents from the sample. Inspection of the histograms reveals that most of the independent variables are skewed. Yet, there are few outliers: three for executive functions and none for the other independent variables[c].

The final sample (N = 905) includes 715 respondents eligible for healthcare benefits, of whom 220 did not claim in 2020 (Table 2). Regarding child support benefits, 238 respondents were eligible, of whom 97 did not claim (Table 3). Of the respondents, 48 were eligible for both benefits in 2020. We found a non-take-up rate of 31% (95% CI 27%-34%) for healthcare benefits and 41% (95% CI 35%-47%) for child support benefits. These non-take-up rates are considerably higher than the last known rates reported by Berkhout et al.[74]: 16% and 15%, respectively. A large amount of negative publicity around benefits in Dutch media due to a scandal involving tens of thousands of unjust reclaims may have contributed to increased mistrust in the Tax Administration, fear of reclaims, and lower take-up rates.

Descriptive statistics

The mean household income for the sample is € 30,076 (Mdn = € 26,400, SD = 15,860), which is lower than the mean for the Dutch population (M = € 32,400, Mdn = € 28,600)[93]. The sample comprises 52% females; the respondents are between 20 and 93 years old (M = 57.00, SD = 17.21). The mean household size is 2.14 (SD = 1.39), which corresponds well with the population's mean (M = 2.17). We created two samples from the total sample: one for health care benefits (N = 715) and one for child support benefits (N = 238).

Healthcare benefits

The mean income of respondents eligible for healthcare benefits (M = € 23,701, SD = 7,967) is below the population mean (Table 2). This is likely due to healthcare benefits aimed at low-income households. The mean eligible amount is € 1,055

c We calculated the number of outliers as proposed by D'Orazio[92]: Q1 − 2k × (Q2 − Q1); Q3 + 2k × (Q3 − Q2) being Q2 the median; this method accounts for slight skewness of the distribution.

(*SD* = 569). Respondents in the healthcare benefits subsample are somewhat older and belong to smaller households than the full sample (*M* = 60.04, *SD* = 17.89). Of the respondents, 20% fully disagree with the statement "I think I am eligible for healthcare benefits", whereas 54% fully agree. The remaining 26% are not (entirely) certain about their eligibility. Self-efficacy, knowledge, financial stress, support, perceived eligibility, and perceived need were higher in the take-up group. In contrast, executive functions, administrative burden, and fear of reclaims were higher in the non-take-up group. Welfare stigma did not differ between the two groups. Spearman's correlations of take-up with most of the variables of interest are weak, with some exceptions (Appendix, Table A1). Take-up of healthcare benefits correlates strongly with perceived eligibility (r_S = .76) and moderately with income (r_S = -.40) and perceived need (r_S = .64).

Child support benefits

For respondents eligible for child support benefits, the mean income is above the population mean (*M* = € 48,061, *SD* = 18,343) (Table 3). In contrast to healthcare benefits, child support benefits do not target low-income households; income thresholds are higher. Child support benefits target families with children, many of whom are two-income households. The mean eligible amount is € 4,847 (*SD* = 4,696). The mean household size (*M* = 4.06, *SD* = 1.15) is higher, and the mean age (*M* = 45.06, *SD* = 7.45) is lower than the healthcare benefits sample. These findings are in line with child support benefits targeting families with children. Notably, 62% of the respondents in this group are female. For child support benefits, 16% of eligible households fully disagree with the statement "I think I am eligible for child support benefits", whereas 36% fully agree. The remaining 48% are not (entirely) certain about their eligibility. Results show that self-efficacy, knowledge, financial stress, support, perceived eligibility, perceived need, and fear of reclaims were higher in the take-up group. Administrative burden and stigma were higher in the non-take-up group. There was no difference in executive functions between the two groups. This pattern differs somewhat from the pattern observed for healthcare benefits. The most notable difference occurs for fear of reclaims: for healthcare benefits, the fear of reclaims is higher in the non-take-up group, whereas for child support benefits, the fear of reclaims is higher in the take-up group. We observed no difference in child support benefits between the two groups, whereas the non-take-up group scored higher on executive functions for healthcare benefits. For welfare stigma, we observed no difference between the two groups for healthcare benefits, whereas the non-take-up group scored

higher on welfare stigma for child support benefits. For child support benefits, take-up correlates strongly with perceived eligibility (r_S = .72) and moderately with income (r_S = -.50), eligible amount (r_S = .43), and perceived need (r_S = .53) (Appendix, Table A2).

Main analyses

We applied maximum likelihood regression on the linear probability models represented by formula (1) and used robust standard errors[94]. We compared the base model – containing only the control variables – with the primary model – including independent and control variables. We standardized the numeric independent variables before conducting regression analyses to ease interpretation. We constructed Wald 95% confidence intervals for the regression coefficients to determine which variables contribute to predicting welfare take-up. Figure 2 graphically summarizes the results.

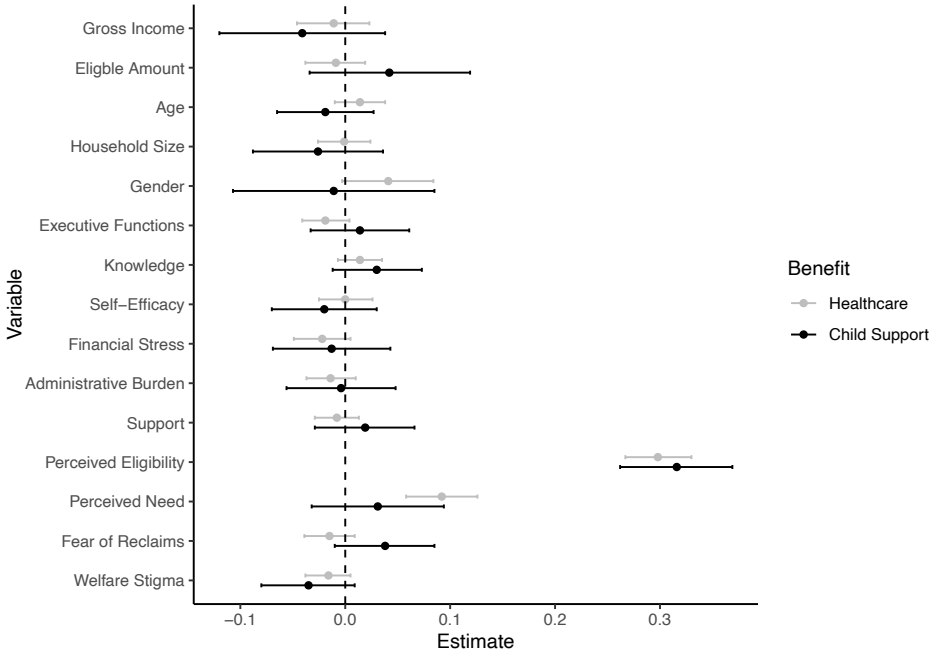

Figure 2. Results of model averaging for healthcare and child support benefits. Dots represent the parameter estimates; lines represent the 95% confidence intervals.

Table 2. Descriptives of the healthcare benefits subsample.

	Take-Up
Characteristic	**Overall, *N* = 715**
Gross Income	23,701.14 (7,967.16) 836.21 38,940.27
Eligible Amount	1,055 (569) 24 2,397
Age	60.04 (17.89) 20.00 93.00
Household Size	1.60 (0.86) 1.00 7.00
Gender: Male	358 (50%)
Gender: Female	357 (50%)
Self-Efficacy	5.54 (1.28) 1.00 7.00
Executive Functions	4.77 (1.11) 1.25 7.00
Knowledge	0.62 (0.72) 0.00 2.00
Financial Stress	2.64 (1.47) 1.00 7.00
Administrative Burden	3.23 (1.63) 1.00 7.00
Support	5.19 (1.44) 1.00 7.00
Perceived Eligibility	5.08 (2.45) 1.00 7.00
Perceived Need	4.41 (1.89) 1.00 7.00
Fear of Reclaims	3.49 (1.72) 1.00 7.00
Welfare Stigma	2.49 (1.18) 1.00 7.00

Mean (SD) Minimum Maximum; n (%). Gross Income and Eligible Amount represent yearly amounts. For the psychological variables, some items were recoded so that higher scores represent higher values.

Healthcare benefits

Results of the base model reveal that income and age explain the take-up of healthcare benefits (Table 4, left). As expected, lower-income households are more likely to take up healthcare benefits. Also, older respondents are more likely to take up healthcare benefits. The model fit increases compared to the null model with only an intercept term; however, it is low (Nagelkerke's[95] $\bar{R}^2 = .24$).

We averaged the regression results over all models with income, eligible amount, age, household size, and gender as control variables (Table 4, right). Results reveal that the take-up of healthcare benefits is significantly explained by perceived eligibility and perceived need after controlling for demographics. The model fit increase compared to the base model is high ($\bar{R}^2 = .89$).

	Take-Up	
	0, *N* = 220	**1, *N* = 495**
	28,350.16 (6,972.92) 4,286.80 38,940.27	21,634.91 (7,502.39) 836.21 38,472.88
	816 (601) 24 2,397	1,162 (521) 48 2,397
	60.53 (16.44) 21.00 89.00	59.83 (18.50) 20.00 93.00
	1.79 (0.88) 1.00 6.00	1.51 (0.84) 1.00 7.00
	135 (61%)	223 (45%)
	85 (39%)	272 (55%)
	5.20 (1.34) 1.00 7.00	5.69 (1.22) 1.33 7.00
	4.98 (1.00) 1.38 7.00	4.68 (1.15) 1.25 7.00
	0.51 (0.69) 0.00 2.00	0.66 (0.73) 0.00 2.00
	2.28 (1.17) 1.00 7.00	2.80 (1.56) 1.00 7.00
	3.46 (1.55) 1.00 7.00	3.13 (1.65) 1.00 7.00
	5.00 (1.52) 1.00 7.00	5.27 (1.41) 1.00 7.00
	2.14 (1.78) 1.00 7.00	6.39 (1.31) 1.00 7.00
	2.51 (1.53) 1.00 7.00	5.25 (1.35) 1.00 7.00
	3.80 (1.75) 1.00 7.00	3.35 (1.70) 1.00 7.00
	2.48 (1.19) 1.00 5.67	2.49 (1.18) 1.00 7.00

The association between take-up and perceived eligibility is the strongest: one standard deviation (*SD*) increase in perceived eligibility is associated with a .30 increase in take-up probability. One *SD* increase in perceived need is associated with a .09 increase in take-up. Contrary to our theoretical model, executive functions, knowledge, self-efficacy, administrative burden, support, fear of reclaims, financial stress, and welfare stigma do not significantly explain the take-up of healthcare benefits.

Table 3. Descriptives of the child support benefits subsample.

	Take-Up
Characteristic	**Overall, *N* = 238[1]**
Gross Income	48,086.26 (18,377.99) 7,391.11 86,039.82
Eligible Amount	4,847 (4,696) 37 32,570
Age	45.06 (7.45) 27.00 77.00
Household Size	4.06 (1.15) 2.00 8.00
Gender: Male	90 (38%)
Gender: Female	148 (62%)
Self-Efficacy	5.80 (1.11) 1.00 7.00
Executive Functions	4.93 (1.16) 1.12 7.00
Knowledge	0.73 (0.63) 0.00 2.00
Financial Stress	2.82 (1.42) 1.00 6.60
Administrative Burden	3.15 (1.58) 1.00 7.00
Support	5.33 (1.29) 1.00 7.00
Perceived Eligibility	4.66 (2.31) 1.00 7.00
Perceived Need	3.98 (1.73) 1.00 7.00
Fear of Reclaims	3.84 (1.64) 1.00 7.00
Welfare Stigma	2.39 (1.14) 1.00 5.67

Mean (SD) Minimum Maximum; n (%). Gross Income and Eligible Amount represent yearly amounts. For the psychological variables, some items were recoded so that higher scores represent higher values.

Child support benefits

For child support benefits, we observe a different pattern for take-up. Model averaging over all possible models with the control variables reveals that income explains take-up ($\bar{R}^2$ = .96, compared to the null model) (Table 5, left).

Results from model averaging over all variants of the primary model indicate that perceived eligibility significantly explains take-up for child support benefits after controlling for demographics ($\bar{R}^2$ = .98, compared to the base model) (Table 5, right). A one *SD* increase in perceived eligibility is associated with a .32 increase in take-up probability. In contrast with healthcare benefits, the take-up of child support benefits is not significantly explained by perceived need. Again, we find no support for executive functions, knowledge, self-efficacy, administrative burden, support, fear of reclaims, financial stress, and welfare stigma significantly explaining the take-up of healthcare benefits.

	Take-Up	
	0, *N* = 97[1]	**1, *N* = 141**[1]
	59,068.96 (14,153.73) 19,943.90 86,039.82	40,530.79 (17,126.90) 7,391.11 79,523.15
	2,817 (2,784) 37 11,223	6,243 (5,215) 127 32,570
	46.14 (6.75) 27.00 72.00	44.32 (7.84) 27.00 77.00
	4.32 (0.90) 2.00 7.00	3.89 (1.27) 2.00 8.00
	47 (48%)	43 (30%)
	50 (52%)	98 (70%)
	5.76 (1.03) 3.67 7.00	5.83 (1.16) 1.00 7.00
	4.95 (1.09) 2.62 7.00	4.91 (1.21) 1.12 7.00
	0.65 (0.65) 0.00 2.00	0.79 (0.62) 0.00 2.00
	2.43 (1.28) 1.00 6.60	3.09 (1.45) 1.00 6.60
	3.29 (1.43) 1.00 5.67	3.05 (1.67) 1.00 7.00
	5.22 (1.23) 2.00 7.00	5.40 (1.34) 1.00 7.00
	2.60 (1.82) 1.00 7.00	6.07 (1.34) 1.00 7.00
	2.86 (1.35) 1.00 6.50	4.74 (1.53) 1.00 7.00
	3.62 (1.59) 1.00 6.67	4.00 (1.67) 1.00 7.00
	2.45 (1.12) 1.00 5.33	2.35 (1.16) 1.00 5.67

Exploratory analyses

In addition to the confirmatory analysis in the previous section, we performed exploratory analyses to check the robustness of our findings to different modeling choices and to examine the interaction effects. The corresponding tables are in the Appendix. Since these analyses are exploratory, we are cautious about drawing conclusions[81]. Confirmatory studies should verify these findings.

When probabilities for the dependent variable are small, it is better to use a binomial instead of a linear probability model. In our case, take-up probabilities were .31 and .41, respectively. Indeed, using a binomial model does not change the results (Appendix, Table A3).

A combined model for the two benefits confirmed that perceived eligibility and perceived need explain take-up (Appendix, Table A4).

Table 4. Results of model averaging for take-up of healthcare benefits

Intercept
Gross Income
Eligible Amount
Age
Household Size
Gender
Executive Functions
Knowledge
Self-Efficacy
Administrative Burden
Support
Perceived Eligibility
Perceived Need
Fear of Reclaims
Financial Stress
Welfare Stigma

Table 5. Results of model averaging for take-up of child support benefits

Intercept
Gross Income
Eligible Amount
Age
Household Size
Gender
Executive Functions
Knowledge
Self-Efficacy
Administrative Burden
Support
Perceived Eligibility
Perceived Need
Fear of Reclaims
Financial Stress
Welfare Stigma

	Base Model				Main Model			
	Estimate	Adjusted SE	95% CI		Estimate	Adjusted SE	95% CI	
	0.626	0.064	0.501	0.751	0.632	0.035	0.563	0.700
	-0.173	0.027	-0.225	-0.121	-0.011	0.018	-0.046	0.023
	0.040	0.021	-0.002	0.082	-0.009	0.015	-0.038	0.019
	0.052	0.018	0.017	0.086	0.014	0.012	-0.010	0.038
	-0.007	0.021	-0.048	0.034	-0.001	0.013	-0.026	0.024
	0.064	0.034	-0.003	0.132	0.041	0.022	-0.003	0.084
					-0.019	0.011	-0.041	0.004
					0.014	0.011	-0.007	0.035
					0.000	0.013	-0.025	0.026
					-0.014	0.012	-0.037	0.010
					-0.008	0.011	-0.029	0.013
					0.298	0.016	0.267	0.330
					0.092	0.017	0.058	0.126
					-0.015	0.012	-0.039	0.009
					-0.022	0.014	-0.049	0.005
					-0.016	0.011	-0.038	0.005

	Base Model				Main Model			
	Estimate	Adjusted SE	95% CI		Estimate	Adjusted SE	95% CI	
	0.540	0.094	0.357	0.723	0.610	0.082	0.450	0.771
	-0.209	0.051	-0.308	-0.110	-0.041	0.040	-0.120	0.038
	0.072	0.053	-0.031	0.176	0.042	0.039	-0.034	0.119
	-0.035	0.029	-0.093	0.023	-0.019	0.023	-0.065	0.027
	-0.053	0.044	-0.139	0.033	-0.026	0.032	-0.088	0.036
	0.075	0.062	-0.047	0.196	-0.011	0.049	-0.107	0.085
					0.014	0.024	-0.033	0.061
					0.030	0.022	-0.012	0.073
					-0.020	0.026	-0.070	0.030
					-0.004	0.027	-0.056	0.048
					0.019	0.024	-0.029	0.066
					0.316	0.027	0.262	0.369
					0.031	0.032	-0.032	0.094
					0.038	0.024	-0.010	0.085
					-0.013	0.029	-0.069	0.043
					-0.035	0.023	-0.080	0.009

To test whether the relative contributions of promoting and inhibiting factors differ between low- and high-income households, we explored models including interactions between the independent variables and income (Appendix, Tables A5 and A6). Similarly, we explored interactions between the independent variables and knowledge (Appendix, Tables A7 and A8). We found that interactions do not aid in explaining take-up.

We explored which variables in our model explained perceived eligibility. For healthcare benefits, perceived eligibility was explained by executive functions, self-efficacy, perceived need, fear of reclaims, financial stress, and welfare stigma (Appendix, Table A9, and Figure A1). Perceived eligibility negatively relates to executive functions, financial stress, and welfare stigma. For self-efficacy, fear of reclaims, financial stress, and welfare stigma, the negative association is as expected. The same goes for the positive associations between self-efficacy and perceived need on one hand, and perceived eligibility on the other. The negative association between perceived eligibility and executive functions is counterintuitive and grants further research. Perhaps higher executive functions are indicative of being more self-sufficient. Households may perceive themselves to be ineligible because they think that benefits are meant for households that are not self-sufficient. The association estimates' confidence intervals for child support benefits included zero. We find no evidence for an association between perceived eligibility and the other independent variables for child support benefits. Figure A1 demonstrates that the confidence intervals are much wider for child support than for healthcare benefits. That may be due to the sample of eligible households for child support benefits being too small to detect differences.

DISCUSSION

The current study empirically tested an integrative model for take-up by households that includes the most relevant factors found in the literature on welfare participation across different research domains. Using Michie et al.'s[28] COM-B Model as a theoretical framework, we identify the relative contribution of various factors (related to capability, opportunity, and motivation) in promoting and inhibiting welfare take-up. We add to the existing take-up literature by testing these factors in conjunction.

We used a survey in a probability sample of the Dutch population to measure potential inhibitors of welfare participation in the Netherlands. We linked the outcomes to the (self-reported) economic data of the respondents. We controlled for demographic variables (income, eligible amount, age, household size, and gender).

For both benefit types, many eligible households perceive themselves as ineligible or uncertain about their eligibility: one in four households for healthcare benefits and almost half for child support benefits. In line with our theoretical model, we find a strong role for perceived eligibility in explaining take-up. When households perceive eligibility as higher, they are more likely to take up benefits. Put differently, when households incorrectly think they are ineligible or uncertain about their eligibility, they are less likely to take up benefits. The strong association between take-up and perceived eligibility remains after correcting for income and eligible amount. This makes it extra noteworthy because it implies that high-income and low-income households may forgo benefits because they incorrectly perceive to be ineligible.

For healthcare benefits, perceived need is an additional strong predictor of take-up. Households who need healthcare benefits to make ends meet or for whom healthcare benefits are more worthwhile are more likely to take up healthcare benefits. We do not find perceived need to be relevant in explaining take-up for child support benefits.

Exploratory analyses indicated that executive functions, perceived need, fear of reclaims, financial stress, and welfare stigma predict perceived eligibility for healthcare benefits. For all but executive functions, the estimates had the expected signs. We found no support for other variables in our model predicting perceived eligibility for child support benefits.

Our findings suggest that motivational factors have the largest direct associations with take-up. Motivations can often be understood in a cost-benefits frame[96], such that motivations can be assumed to be stronger when the costs of certain behaviors are lower or benefits are higher. Some elements of the factors we included can be conceived as more related to the costs of claiming (e.g., stigma), while others are more related to the benefits of claiming (e.g., perceived need). But there may also be other costs and benefits that one could consider. For future research, it may be helpful to supplement our framework to include and specify information costs (time, effort, and money needed to find information about eligibility, benefits, etc.) or supplement the data on benefits with the expected duration of the welfare.

Our findings contribute to identifying the main inhibitors of welfare participation and their relative contribution to non-take-up. To our knowledge, our study is the first to empirically examine the interplay of a comprehensive set of psychological factors in explaining welfare participation. Our findings suggest that motivational factors have the largest direct association with take-up.

The results of this study can aid policymakers in identifying which factors might best be targeted when designing interventions aimed at increasing take-up. Results suggest that targeting perceived eligibility may be the most promising avenue for increasing take-up. Households who incorrectly perceive themselves as ineligible or are uncertain about their eligibility are less likely to take up benefits. Because we found no support for general knowledge about benefits programs in explaining take-up, we propose a personalized approach to informing or reassuring households about their eligibility. The effectiveness of such interventions could be increased by combining them with interventions considering self-efficacy, fear of reclaims, and welfare stigma. Self-efficacy may be increased by training eligible households in applying and providing clear and understandable instructions. The fear of reclaims is often realistic; when households do not provide updates to the Tax Office when their circumstances change, this may result in a reclaim. Making the update process as easy as possible and reminding households to provide updates when their circumstances change may decrease the risk and fear of reclaims. It may be possible to reduce welfare stigma by pointing out to eligible households that many others in a similar situation claim benefits.

At the same time, we caution against overstating the immediate policy implications of our current findings. Indeed, it would be good to replicate our study findings with confirmatory analyses in searching for and developing effective interventions. In addition, we advise policymakers and scholars to set up experiments to test interventions' effectiveness jointly. Also, experiments may provide a viable route to establish causal relationships between the variables of interest. Our correlational cross-sectional study allowed us to examine relationships as they exist in the real world but do not provide a solid basis for causal inferences.

A particular strength of the current study is that it incorporated several potential promotors and inhibitors of take-up. This enabled us to determine the relative strength of these factors. Also, our approach reduced the risk of finding spurious associations compared to previous studies. Our study also has some limitations. First, it used self-reported data. Previous studies have indicated that self-reported take-up may contain errors[97,98]. Future studies could link potential thresholds for take-up with administrative records. Second, our study focused on thresholds and inhibitors of welfare participation at the household level. Future studies could examine how factors at the level of society, administration, and social networks interact with factors operating at the level of individual households. Third, our study did not consider the different stages of welfare participation. Future studies could examine the association between promotors and inhibitors of take-up in various stages of the welfare participation process (orientation, application, appeal, and update)[11].

Our study revealed the relative contribution of different factors to explaining take-up for the broad population of eligible households. Future studies could examine the lived experiences of financially vulnerable households with welfare participation. Such studies could deepen our understanding of promoting and inhibiting factors in take-up for groups that welfare programs aim to address par excellence. Also, such studies could reveal whether the relative contribution of factors affecting take-up differs for financially vulnerable households. Moreover, such studies could reveal aspects that have not been studied thus far.

We focused on healthcare and child support benefits in the Dutch context. It would be worthwhile to test our model in other contexts, that is, for additional benefit types and different jurisdictions.

In sum, our results show that elements of motivation, in particular perceived eligibility and need, explain participation in two Dutch national benefits programs. Exploratory results suggest that aspects of capability and motivation may explain perceived eligibility. Promotors and inhibitors of take-up may differ between welfare programs. Our findings imply that a personalized approach to informing households about their eligibility is a promising avenue for increasing take-up. Also, providing training and instruction, and reducing welfare stigma, may improve income security and reduce financial distress.

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CHAPTER 6. APPENDIX
HEALTHCARE BENEFITS AND CHILD SUPPORT BENEFITS

Overview

The Netherlands has a wide range of different arrangements for income support, including social provision, social security, and employee insurance schemes. Most schemes are based on national law; administration is delegated to local municipalities in many cases. Local municipalities often have supplemental income support programs to support the poorest families. This Appendix section an overview of the national benefits relevant for our study.

Healthcare benefits (HCB, *zorgtoeslag*) is a means-tested benefit that supports low-income families paying for their mandatory health insurance. Individuals aged 18 or more are eligible when they use health insurance in the Netherlands, pay the premium, and meet the income and asset thresholds (on household level). Those who are in the military service, incarcerated, and foreign students who do not work in the Netherlands are not eligible for HA. People living abroad who have mandatory health insurance in the Netherlands are eligible, as are EU-residents who receive a pension or allowance from the Netherlands in some cases.

Child support benefits (CSB, *kindgebonden budget*) cover costs such as children's clothing, food and school expenses for low-income households. The program is meant for those who have children under 18 (including step-children, foster children and adopted children), meeting income and asset criteria and receiving a general child allowance (GCA, *kinderbijslag*). The income threshold depends on the number of children and their ages. Parents that don't receive GCA for a child aged 16 or 17 who2 does not receive a student's grant, whom they support financially (meaning that they pay at least € 425 per quarter), are eligible. In case of a divorce, the parent who receives GCA also receives CB. In the case of two parents that both have children from a previous relationship for which they receive GCA, only one of the parents receives CSB. When a household receives one of the other three benefits, CSB is provided automatically in case of eligibility.

The "Allowance Scandal" (also known as the childcare allowance affair or allowances scandal) is a Dutch political affair resulting from unjustified fraud suspicions with childcare allowances and the strict recoveries in case of errors. From 2017, the affair received increasing attention. As of 2017, the affair received increasing attention. According to investigative committees, the working

methods of the Tax and Customs Administration were unlawful, discriminatory and improper, and there was institutional bias and violation of the fundamental principles of the rule of law. From 2004 to 2019, it was estimated that there were 26,000 parents and thus 70,000 children. They had made – often minor – mistakes or had been misled by childminder agencies and therefore had to repay the total childcare allowance. As a result, many victimized parents ended up in debt, which in some cases amounted to tens of thousands and even hundreds of thousands of euros. Victims had to deal with the large-scale disruption of their lives due to, among other things, loss of job or home, relocation of children or psychological problems. In 2019, State Secretary for Finance Menno Snel resigned. After a parliamentary interrogation committee investigation, former Minister of Social Affairs and Employment Lodewijk Asscher withdrew as Labour leader in January 2021. A few days later, the entire Rutte III cabinet resigned, and former State Secretary of Finance Eric Wiebes resigned as a minister with immediate effect.

Eligibility conditions for benefits in 2020

This section describes the main eligibility conditions for the two types of national benefits in scope for our study (first two subsections). The third subsection describes when people are "benefits partners."

Health care benefits

The main criteria for health care benefits in 2020 were:

- Minimum age 18 years;
- Using mandatory health insurance in the Netherlands and paying the premium;
- Living in the Netherlands with a Dutch nationality or a residence permit or resident of a Dutch municipality with a Nationality from an EU country, Liechtenstein, Norway, Iceland, or Switzerland;
- Maximum income (*toetsingsinkomen*) € 30.481 for individuals, or € 38.945 for benefits partners;
- Maximum capital € 116.613 for individuals, or € 147.459 for benefits partners (a definition of benefits partners is given below).

Special situations:

- People in the military service, in prison, conscientious objectors, and international students who do not work here are not eligible for health allowance.

- In some cases, people living in an EU country who receive a pension or allowance from the Netherlands are eligible for healthcare allowance.
- People living abroad who have mandatory health insurance in the Netherlands are eligible for healthcare allowance.
- Dutch residents who work abroad are generally not eligible for healthcare allowance because they don't have health insurance in the Netherlands.

Child support benefits

The main criteria for Child support benefits in 2020 were (Ministry of Internal Affairs, 2019b):

- People who have children under 18 years of age (including step-children, foster children, and adopted children);
- Receiving a general child allowance (*kinderbijslag*);
- Maximum income depends on household composition (see the calculation below). The threshold is 108% of the minimum wage. For 2020, this amounts to € 16.391. Above the threshold, eligible amounts are decreased.
- Dutch nationality or a valid residence permit;
- Maximum capital € 116.613 for individuals, or € 147.459 for benefits partners (a definition of benefits partners is given below).

Special situations:

- If income is above the threshold income, then the following calculation is applied to determine eligibility (if one's calculated benefit is positive, then one is eligible):
- The benefit amount is € 1,166 for one child, € 2,155 for two children, and € 2,447 for three or more children.
- The amount is increased by € 239 for each child between 12 and 16 years old
- The amount is increased by € 427 for each child between 16 and 17 years old
- The amount is increased by € 3,139 for single parents
- 6,75% of the difference between actual income and threshold income (*toetsinkomen)* is deducted from the benefit amount.
- People that don't receive a general child allowance (*kinderbijslag*) for a child aged 16 or 17 that does not receive a student's grant, and who support them financially (meaning that they pay at least € 425 per quarter) to support them, are eligible.
- In case of a divorce, only one parent receives child benefits (the parent who receives the general child allowance (*kinderbijslag*).
- In the case of two parents that both have children from a previous relationship for which they receive general child allowance, only one of the parents receives child benefits.

- People living outside of the Netherlands are eligible if they meet the other eligibility criteria.

Benefits partners

When people are benefits partners, total household income determines eligibility. People are benefits partners when they are married or have a registered partnership. Cohabitants are also benefits partners when:

- they were benefits partners in the previous year
- they have a formal cohabitation contract
- they are fiscal partners for the income tax
- they are partners in a pension arrangement
- they have a child together
- they have acknowledged someone else's child together
- they – or one of their cohabitants – have a child under the age of 18 (there are two exceptions, see below)
- they own a house together
- If you are benefits partners for part of a year, you do not need to sum your incomes and assets.

Exceptions

Cohabitants are not benefits partners if:

- one of the two cohabitants is the other's parent and younger than 27 years of age in the year of application OR
- there are three cohabitants older than 18

Eligible amounts

This section describes how the eligible amounts for the two types of national benefits in scope for our study are calculated.

Health care benefits

Eligible amounts for health care benefits are calculated as follows.

1. Determine the standard premium. For 2020, the standard premium is € 1.642 (€ 3.284 for benefits partners).
2. Calculate household income.
3. Calculate norm premium.
   a. For requestors without a partner: norm premium = 1,830% x € 21.431. + 13,550% (household income - € 21.431).
   b. For requestors with a partner: norm premium = 4,140% x € 21.431. + 13,550% (household income - € 21.431)

If the norm premium is negative, then use a norm premium of € 0.

4. Calculate eligible health care benefits. Health care benefit = standard premium -/- norm premium.
5. De maximum eligible health care benefit amount is achieved with a household income lower than € 21.431. For a requestor without a benefits partner, this amount is € 1.250. For a requestor with a benefits partner, the maximum amount is € 2.397.

Child support benefits

Eligible amounts for health care benefits are calculated as follows.

1. Determine the maximum benefit amount using the following table

Number of children	Single parent	Parent with benefit partner
1	€ 4.375	€ 1.185
2	€ 5.380	€ 2.190
3	€ 5.677	€ 2.487
>= 4 (per child)	€ 297	€ 297

2. Increase the maximum eligible amount. If there is a child of 12 years or older, then increase the maximum eligible amount with
   - € 243 for each child aged 12 - 15
   - € 434 for each child aged 16 - 17
3. Calculate household income. This is the income of the requestor and their benefits partner (if applicable)
4. Calculate decrease.
   - For single parents: decrease = 6,75% x (het toetsingsinkomen -/- €21.431)
   - For parents with a benefits partner: decrease = 6,75% x (household income -/- € 38.181)
5. Calculate benefit amount. As maximum eligible amount (step 1) + increase (step 2) -/- decrease (step 4).

SURVEY QUESTIONNAIRE

(Translated from Dutch)

Unless otherwise specified, the items were 7-scale-Likert items (1 = *fully disagree* ... 7 = *fully agree*).

Welfare take-up

Which of the following benefits did you receive in 2020?

1. Health care benefits
2. Child support benefits
3. Both
4. Neither

Executive functions

1. I am not able to focus on the same topic for an extended period *(v1a)*
2. I am easily distracted *(v1b)*
3. My thoughts easily wander *(v1c)*
4. I often react too fast. I often do or say something before it is my turn *(v1d)*
5. It is difficult for me to sit still *(v1e)*
6. It takes a lot of effort for me to remember things *(v1f)*
7. I often forget what I did yesterday *(v1g)*
8. I often lose things *(v1h)*
9. I am well-organized. For example, I am good at planning things that I need to do during a day *(v1i)*
10. It is easy for me to come up with a different solution if I get stuck when solving a problem *(v1j)*
11. I am full of new ideas *(v1k)*
12. I am curious. I want to know how things work *(v1l)*

Financial stress

1. I often don't have enough money *(v2a)*
2. I am constantly wondering whether I have enough money *(v2b)*
3. I worry about money a lot *(v2c)*
4. Because of my financial situation, I live from day to day *(v2d)*
5. I experience little control over my financial situation *(v2e)*

Perceived eligibility (1 = *certainly not* .. 7 = *certainly*).

1. I think that I was eligible for health care benefits in 2020 *(v3a)*
2. I think that my household was eligible for Child support benefits in 2020 *(v3b)*

Perceived need

1. Receiving child support benefits is worthwhile for me *(v4a)*
2. Receiving health care benefits is worthwhile for me *(v4b)*
3. Without health care benefits, it is difficult for me to make ends meet *(v4c)*
4. Without child support benefits, it is difficult for me to make ends meet *(v4d)*

Welfare stigma

1. People in my environment have a negative view of those who use welfare *(v4e)*
2. I am ashamed if I have to apply for health care benefits or Child support benefits *(v4f)*
3. There are negative prejudices about people who use Child support benefits or health care benefits *(v4g)*

Self-efficacy

1. I am confident that I can figure out if I am eligible for benefits *(v5a)*
2. If I want to, it is easy for me to apply for benefits *(v5b)*
3. Even if I try hard, I don't think I will succeed in applying for benefits *(v5c)*

Social support

1. I have people around me to turn to if I need help with welfare *(v5d)*
2. It is easy for me to find help applying for welfare if I cannot do it myself *(v5e)*
3. If I fail to apply for welfare, I know where to turn for help *(v5f)*

Administrative burden

1. It costs me a lot of time to figure out if I am eligible for welfare *(v6a)*
2. Applying for welfare is a lot of hassle *(v6b)*
3. It costs me a lot of effort to apply for benefits *(v6c)*

Fear of reclaims

1. I am concerned – when I receive benefits – that I have to repay them (partly) *(v6d)*
2. The thought that I will get a fine for receiving too much welfare makes me anxious *(v6d)*
3. I am worried that I have to repay benefits because of a mistake (v6e)

Eligibility

1. Did you or your partner receive a general child allowance in 2020? (*yes/no*)

Knowledge

1. Sem has just turned 18. She lives with her parents, Niels (46) and Fadime (45). She has a side job. She has health insurance, for which her parents pay the premium. Niels and Fadime's yearly income is € 60.000. Sem's yearly income is € 7.000. Is Sem eligible for healthcare allowance?
   a. No, because she lives with her parents
   b. No, because her parents' income is too high
   c. No, because her parents pay the health insurance premium
   d. Yes
   e. I don't know
2. Niels (46) and Fadime (45) own the house that they live in. Jolanda, Niels' sister, lives with them, together with her son Robin. Who is Niels' benefits partner?
   a. Only Fadime
   b. Only Jolande
   c. Fadime and Jolande
   d. Neither Fadime nor Jolande
   e. I don't know
3. Scott and Pamela live together. They receive Child support benefits for their daughter Kelly. Kelly will turn 16 next month. What does this mean for their Child support benefits?
   a. The amount stays the same.
   b. The amount increases.
   c. Their eligibility end
   d. I don't know.

CORRELATIONS

Healthcare Benefits

For healthcare benefits, Spearman's correlations between most of the variables of interest are weak, with a number of exceptions (Table 4).[d] Take-up of healthcare benefits correlates strongly with perceived eligibility (r_S = .76) and moderately with income (r_S = -.40) and perceived need (r_S = .64). Income correlates moderately with eligible amount (r_S = -.64), household size (r_S = .47), perceived eligibility (r_S = -.45), and perceived need (r_S = -.49). Eligible amount correlates moderately with perceived need (r_S = -.40). Administratrive burden correlates moderately with fear of reclaims (r_S = .51). Self-efficacy correlates moderately with administrative burden (r_S = -.56). Perceived eligibility correlates moderately with perceived need (r_S = .68). Perceived need correlates moderately with financial stress (r_S = .42). These correlations have the expected signs.

Table A1. Correlations for Healthcare Benefits

	2	3	4	5	6	7
1. Take-up	-.40	.31	.00	-.20	.15	-.12
2. Gross Income		-.64	.27	.47	-.29	.05
3. Eligible Amount			-.03	.09	-.01	-.03
4. Age				.09	-.19	.07
5. Household Size					-.26	.05
6. Gender (F)						.06
7. Executive Functions						
8. Knowledge						
9. Self-Efficacy						
1. Administrative Burden						
11. Support						
12. Perceived Eligibility						
13. Perceived Need						
14. Fear of Reclaims						
15. Financial Stress						
16. Welfare Stigma						

d We used Dancy and Reidy's (2007) characterizations: $r < .40$ = weak; $.40 < r < .69$ = moderate; $r > 0.69$ = strong.

Child Support Benefits

For child support benefits, correlations lead to similar findings (Table 5). Take-up correlates strongly with perceived need (r_S = .72) and moderately with income (r_S = -.50), eligible amount (r_S = .43), and administrative burden (r_S = .53). Income has a strong correlation with eligible amount (r_S = -.72) and a moderate correlation with perceived eligibility (r_S = -.50) and perceived need (r_S = -.57). Eligible amount has a moderate correlation with perceived eligibility (r_S = .43) and perceived need (r_S = .47). Self-efficacy correlates strongly with administrative burden (r_S = -.57). Administrative burden correlates strongly with fear of reclaims (r_S = .40). Perceived eligibility correlates moderately with perceived need (r_S = .62). There is a moderate correlation between perceived need and financial stress (r_S = .53). Again, correlation signs are as expected.

8	9	10	11	12	13	14	15	16
.10	.18	-.09	.08	.76	.64	-.12	.14	.00
-.08	-.05	-.01	-.03	-.45	-.49	.03	-.22	-.02
.05	.01	.01	-.02	.36	.40	-.05	.11	.05
-.23	-.17	.14	-.05	-.05	-.09	-.09	-.31	.06
.04	-.02	-.01	-.08	-.20	-.17	.05	-.03	.01
.09	.11	-.07	.13	.13	.12	.02	-.04	-.05
.11	.22	-.22	.09	-.09	-.13	-.22	-.34	-.07
	.26	-.21	.09	.10	.08	-.10	.00	-.07
		-.56	.34	.26	.17	-.32	-.13	-.23
			-.16	-.13	.01	.51	.21	.26
				.14	.07	-.19	-.15	-.19
					.68	-.16	.15	-.02
						.04	.42	.16
							.39	.22
								.25

Table A2. Correlations for Child Support Benefits

	2	3	4	5	6	7
1. Take-up	-.5	.43	-.12	-.19	.18	-.01
2. Gross Income		-.72	.13	.34	-.19	.06
3. Eligible Amount			-.04	.14	.19	-.03
4. Age				.01	-.22	.10
5. Household Size					-.17	.02
6. Gender (F)						.03
7. Executive Functions						
8. Knowledge						
9. Self-Efficacy						
1. Administrative Burden						
11. Support						
12. Perceived Eligiblity						
13. Perceived Need						
14. Fear of Reclaims						
15. Financial Stress						
16. Welfare Stigma						

8	9	10	11	12	13	14	15	16
.11	.06	-.08	.09	.72	.53	.12	.23	-.05
-.11	.04	.09	.08	-.50	-.57	-.12	-.39	-.11
.07	.01	-.08	.01	.43	.47	.09	.29	.02
-.01	-.12	.10	-.21	-.13	-.09	-.17	-.02	-.01
-.01	-.12	.05	.08	-.22	-.25	-.05	-.13	-.01
-.03	.15	-.11	.19	.21	.13	.08	.03	-.08
.08	.26	-.23	.25	-.06	-.13	-.27	-.34	-.27
	.09	-.02	.07	.05	.03	.03	.04	-.08
		-.57	.33	.17	.04	-.29	-.33	-.24
			-.27	-.12	-.04	.40	.21	.25
				.10	-.06	-.19	-.24	-.30
					.62	.02	.25	.00
						.22	.53	.14
							.37	.11
								.30

EXPLORATORY ANALYSES

Table A3: Robustness check: model averaging for a binomial model

	Healthcare benefits				Child support benefits			
	Estimate	Adjusted SE	95% CI		Estimate	Adjusted SE	95% CI	
Intercept	.611	.506	-.381	1.603	1.202	.797	-.359	2.764
Gross Income	-.169	.262	-.683	.345	.017	.434	-.833	.867
Eligible Amount	-.155	.211	-.568	.258	1.115	.582	-.025	2.256
Age	.202	.179	-.148	.552	-.287	.234	-.746	.172
Household Size	-.028	.176	-.372	.316	-.738	.419	-1.559	.083
Gender	.661	.331	.012	1.310	-.263	.465	-1.174	.649
Executive Functions	.266	.177	-.082	.613	-.220	.242	-.695	.255
Knowledge	.181	.168	-.148	.511	.303	.219	-.127	.733
Administrative Burden	-.229	.195	-.611	.152	.000	.305	-.597	.598
Support	-.080	.155	-.383	.223	.164	.265	-.356	.684
Perceived Eligibility	1.796	.191	1.421	2.171	2.067	.315	1.451	2.684
Perceived Need	1.165	.233	.709	1.621	.410	.316	-.209	1.028
Fear of Reclaims	-.330	.172	-.667	.006	.512	.280	-.038	1.061
Financial Stress	-.285	.212	-.699	.130	-.026	.280	-.575	.523
Welfare Stigma	-.266	.161	-.583	.050	-.321	.238	-.787	.146

Table A4: Explorative results of model averaging for a combined model for both benefits types

	Estimate	Adjusted SE	95% CI	
Intercept	.403	.048	.308	.498
Gross Income	-.085	.021	-.125	-.045
Eligible Amount	-.005	.016	-.036	.027
Age	.045	.011	.023	.068
Household Size	-.096	.020	-.135	-.056
Gender	.012	.021	-.030	.054
Executive Functions	.019	.011	-.002	.040
Knowledge	.011	.011	-.010	.032
Administrative Burden	-.011	.012	-.034	.013
Support	.008	.011	-.013	.028
Perceived Eligibility	.307	.013	.283	.332
Perceived Need	.030	.011	.009	.051
Fear of Reclaims	-.009	.012	-.032	.013
Financial Stress	-.013	.013	-.039	.013
Welfare Stigma	-.025	.011	-.046	-.003

Table A5: Explorative results of model averaging for take-up of health care benefits with interactions

	Estimate	Adjusted SE	95% CI	
Intercept	0.639	0.037	0.567	0.711
Perceived Eligibility	0.293	0.017	0.259	0.326
Perceived Need	0.095	0.017	0.061	0.129
Gender (F)	0.038	0.023	-0.006	0.082
Financial Stress	-0.027	0.014	-0.054	0.000
Income * Perceived Eligibility	0.023	0.014	-0.005	0.051
Income * Financial Stress	-0.022	0.012	-0.044	0.001
Executive Functions	0.020	0.011	-0.002	0.042
Income	-0.016	0.018	-0.052	0.020
Fear of Reclaims	-0.015	0.012	-0.039	0.009
Income * Support	-0.015	0.011	-0.036	0.006
Administrative Burden	-0.014	0.012	-0.037	0.010
Eligible Amount	-0.013	0.015	-0.043	0.016
Age	0.011	0.012	-0.013	0.035
Income * Perceived Need	0.010	0.018	-0.026	0.046
Support	-0.008	0.011	-0.029	0.013
Administrative Burden * Income	-0.004	0.011	-0.026	0.017
Household Size	0.003	0.013	-0.023	0.028

Table A6: Explorative results of model averaging for take-up of child support benefits with interactions for income

	Estimate	Adjusted SE	95% CI	
Intercept	0.605	0.082	0.444	0.766
Perceived Eligibility	0.313	0.030	0.255	0.371
Income	-0.060	0.036	-0.131	0.011
Eligible Amount	0.045	0.039	-0.031	0.121
Fear of Reclaims	0.038	0.024	-0.010	0.086
Perceived Need	0.037	0.033	-0.028	0.101
Income * Support	0.033	0.023	-0.011	0.078
Executive Functions	-0.024	0.023	-0.069	0.022
Support	0.024	0.024	-0.023	0.072
Income * Perceived Eligibility	0.022	0.027	-0.032	0.075
Income * Financial Stress	-0.019	0.024	-0.066	0.029
Age	-0.016	0.024	-0.062	0.030
Financial Stress	-0.015	0.028	-0.070	0.041
Household Size	-0.013	0.029	-0.071	0.044
Gender (F)	-0.006	0.049	-0.102	0.090
Administrative Burden	0.001	0.025	-0.049	0.051
Administrative Burden * Income	0.000	0.023	-0.045	0.044

Table A7: Explorative results of model averaging for take-up of healthcare benefits with interactions for knowledge

	Estimate	**Adjusted SE**	**95% CI**	
(Intercept)	0.631	0.035	0.562	0.700
Perceived Eligibility	0.300	0.016	0.269	0.332
Perceived Need	0.088	0.017	0.054	0.123
Gender	0.041	0.022	-0.003	0.085
Financial Stress	-0.023	0.014	-0.049	0.004
Executive Functions * Knowledge	0.022	0.011	0.000	0.044
Executive Functions	-0.020	0.011	-0.042	0.002
Fear * Knowledge	0.017	0.011	-0.005	0.039
Fear	-0.015	0.012	-0.039	0.010
Knowledge	0.014	0.011	-0.008	0.035
Age	0.014	0.012	-0.011	0.038
Administrative Burden	-0.013	0.012	-0.038	0.011
Gross Income	-0.011	0.018	-0.046	0.023
Knowledge * Financial Stresss	0.011	0.013	-0.014	0.036
Self-efficacy * Knowledge	-0.011	0.014	-0.038	0.016
Administrative Burden * Knowledge	-0.010	0.014	-0.037	0.017
Knowledge * Support	-0.009	0.011	-0.030	0.012
Eligible Amount	-0.008	0.015	-0.037	0.020
Support	-0.008	0.011	-0.029	0.013
Household Size	-0.002	0.013	-0.027	0.023
Knowledge * Perceived Eligibility	0.001	0.012	-0.023	0.025
Self-efficacy	0.001	0.013	-0.025	0.027
Knowledge * Perceived Need	0.000	0.013	-0.025	0.026

Table A8. Explorative results of model averaging for take-up of child support benefits with interactions for knowledge

	Estimate	Adjusted SE	95% CI	
(Intercept)	0.594	0.083	0.432	0.756
Perceived Eligibility	0.316	0.028	0.261	0.371
Gross Income	-0.053	0.037	-0.125	0.020
Eligible Amount	0.044	0.039	-0.033	0.122
Knowledge:Perceived Eligibility	-0.042	0.028	-0.097	0.013
Knowledge:Perceived Need	0.040	0.031	-0.021	0.101
Fear	0.038	0.025	-0.011	0.087
Perceived Need	0.036	0.032	-0.027	0.100
Knowledge	0.032	0.022	-0.011	0.075
Executive Functions * Knowledge	-0.031	0.023	-0.075	0.013
Knowledge * Support	-0.024	0.021	-0.064	0.017
Support	0.022	0.024	-0.025	0.069
Administrative Burden * Knowledge	0.022	0.023	-0.023	0.066
Self-efficacy	-0.021	0.027	-0.074	0.031
Executive Functions	0.018	0.024	-0.029	0.065
Fear * Knowledge	0.018	0.024	-0.028	0.065
Financial Stress	-0.018	0.029	-0.075	0.038
Household Size	-0.013	0.030	-0.071	0.045
Age	-0.013	0.024	-0.059	0.033
Administrative Burden	-0.010	0.027	-0.063	0.042
Self-efficacy * Knowledge	-0.009	0.026	-0.060	0.041
Knowledge * Financial Stress	0.007	0.028	-0.048	0.061
Gender	0.000	0.049	-0.096	0.097

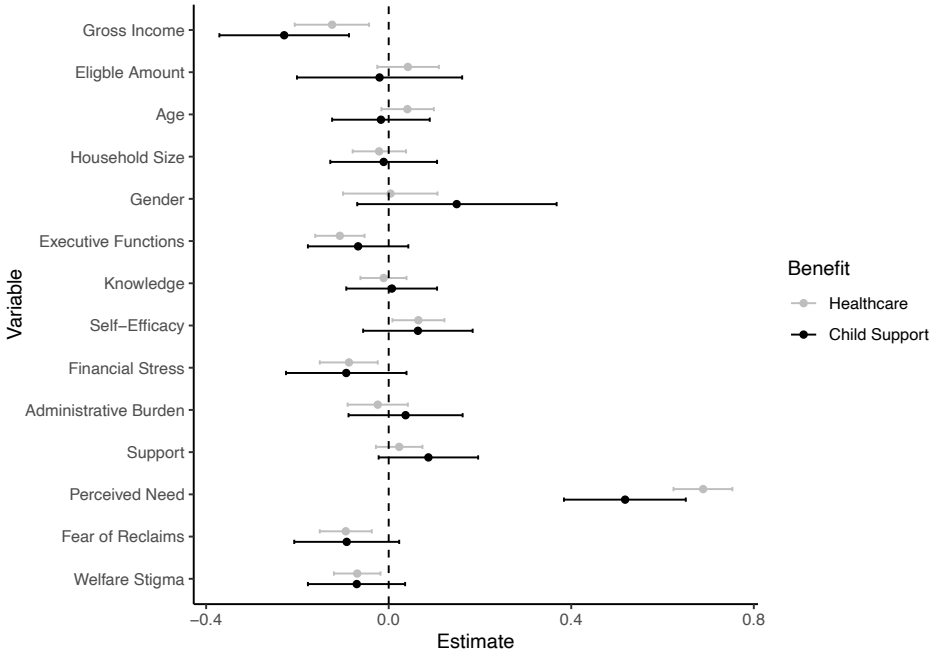

Figure A1. Results of model averaging for perceived eligibility of healthcare and child support benefits. Dots represent the parameter estimates; lines represent the corresponding 95% confidence intervals.

Table A9: Explorative results of model averaging for Perceived Eligibility

Intercept
Gross Income
Eligible Amount
Age
Household Size
Gender
Executive Functions
Knowledge
Self-Efficacy
Financial Stress
Administrative Burden
Support
Perceived Need
Fear of Reclaims
Welfare Stigma

	Health care benefits				Child care benefits			
	Estimate	Adjusted SE	95% CI		Estimate	Adjusted SE	95% CI	
	-0.006	0.083	-0.168	0.156	-0.242	0.187	-0.609	0.125
	-0.124	0.042	-0.206	-0.043	-0.229	0.072	-0.371	-0.087
	0.042	0.035	-0.025	0.110	-0.020	0.092	-0.201	0.161
	0.041	0.029	-0.016	0.099	-0.017	0.055	-0.124	0.090
	-0.021	0.030	-0.079	0.038	-0.011	0.060	-0.128	0.106
	0.004	0.053	-0.100	0.107	0.149	0.111	-0.069	0.368
	-0.107	0.027	-0.161	-0.053	-0.067	0.056	-0.177	0.043
	-0.011	0.026	-0.062	0.039	0.007	0.051	-0.093	0.106
	0.065	0.029	-0.008	0.122	0.064	0.061	-0.056	0.184
	-0.087	0.033	-0.151	-0.024	-0.093	0.067	-0.225	0.039
	-0.024	0.034	-0.090	0.042	0.037	0.064	-0.088	0.162
	0.023	0.026	-0.028	0.074	0.087	0.056	-0.022	0.196
	0.689	0.033	-0.624	0.753	0.518	0.068	0.384	0.651
	-0.094	0.029	-0.151	-0.037	-0.092	0.059	-0.207	0.023
	-0.069	0.026	-0.120	-0.018	-0.070	0.054	-0.177	0.036

Chapter 7

Do reclaims trigger non-take-up of social welfare? Experimental evidence from a household paradigm

Based on:

Simonse, O., Hilbert, L. P., Van Dillen, L. F., Van Dijk, W. W., Van Dijk, E. & Noordewier, M. K. Do reclaims cause non-take-up of social welfare? Experimental evidence from a household paradigm. (Submitted for publication). Preprint available on *https://osf.io/nrptg/*

ABSTRACT

Many eligible households do not take up social welfare. Reclaims resulting from overpayments have been proposed as a potential reason for non-take-up. We conducted two preregistered experiments (total N = 472) to examine if reclaims cause non-take-up and if this effect is stronger when reclaims result in indebtedness. We used an experimental paradigm that simulated managing a household's finances. Participants received social welfare and then did versus did not have to pay a reclaim, resulting in a financial shock. Subsequently, they were asked whether they wanted to continue taking up social welfare. Both experiments showed, as hypothesized, that reclaims increased subsequent non-take-up of social welfare. We found some preliminary support for our hypothesis that this effect was stronger for participants who ended up in debt after the reclaim. In the second experiment, we included an additional condition in which the financial shock was not caused by a reclaim but by an unrelated event. Results showed that take-up did not decrease in this condition, indicating that the adverse effect of a financial shock on take-up is specific to reclaims. Together, these findings suggest that reclaims may result in non-take-up of social welfare. In the discussion, we address the potential policy implications and avenues for future research.

INTRODUCTION

Challenges in social welfare

Social welfare stabilizes individuals and societies by providing financial security to those who cannot sustain themselves. The stabilizing role of social welfare is crucial in heightened macroeconomic uncertainties and volatile labor markets[1]. This may explain why policymakers' focus on social security significantly increased during the COVID-19 pandemic[2].

The effectiveness of social welfare systems in achieving their objectives depends on their accessibility to those who need support[3]. Policymakers face a challenge in this regard. On the one hand, they implement eligibility rules to ensure that social welfare reaches those most in need. On the other hand, these rules can create barriers that may deter eligible households from taking up social welfare[4,5].

Recent studies documented the extent of non-take-up of social welfare benefits. A study in the UK revealed that 30% of those entitled to Pension Credit did not claim, and 20% of those eligible for Housing Benefits for pensioners did not claim[6]. Similarly, a study across six European countries found that non-take-up of minimum income benefits ranged from 38% to 90%[7]. For individual households, non-take-up of social welfare may adversely affect their financial and overall well-being[8]. From a governmental perspective, non-take-up contradicts the goal of social security to provide stability to citizens, may exacerbate inequality, and erode the legitimacy of welfare systems[9,10]. Therefore, understanding the non-take-up of social welfare by eligible households is essential.

Reclaims and non-take-up

The decreasing job stability in the last decades, mainly due to more flexible contracts, more zero-hours contracts, and increasing numbers of self-employed, poses another challenge for social welfare systems: being sufficiently agile and responsive to households' volatile situations[11]. Millar and Whiteford[12] observed that "responsiveness [..] can be particularly challenging when changes in income and circumstances are frequent and unpredictable." (p. 5). They argued that the risk of welfare payments getting out of step with circumstances increases, which may result in overpayment and, hence, reclaims. Many social welfare systems worldwide offer advance payments to households to assist with unexpected emergencies or sudden income reductions. These advance payments may be reclaimed[a,b,c]. In the Dutch National Welfare Program (*Toeslagen*), payments are consistently issued in advance, calculated based on estimated income.

Adjustments are made retrospectively once actual income becomes known. If income turns out to be higher than estimated, reclaims may result. The recent support programs in response to COVID-19 illustrate how responsiveness may result in reclaims. Many governments around the globe compensated companies for the loss of revenue due to the pandemic. Governments based the compensation on estimated revenues to quickly support companies and prevent them from going bankrupt. Many companies may have to repay (part of) the received support if revenues are higher[13,14]. In the Netherlands, an estimated one-third of the first support package issued immediately after the pandemic will be reclaimed[14].

Reclaims create adverse financial shocks for social welfare claimants. Previous studies have shown that adverse financial shocks can negatively affect well-being and mental health. In a study among US households, the Consumer Financial Protection Bureau[15] found that households experiencing a financial shock in the past 12 months had lower financial well-being scores than those that did not. Similarly, Bufe et al.[16] demonstrated a significant decline in subjective financial well-being in response to income shocks. Codagnone et al.[17] reported that during the COVID-19 pandemic, economic vulnerability and exposure to adverse economic shocks placed 42.8% of respondents at a high risk of stress, anxiety, and depression.

Previous studies have also shown that reclaims have the potential to induce financial hardship and exacerbate financial stress[18–20]. The repercussions of these reclaims are more pronounced for low-income households. Such households typically receive higher benefits, resulting in higher reclaims. Consequently, a payback period is longer after a reclaim, and individuals within these income brackets remain entrenched in financial hardship for an extended period[21,22]. Two extreme cases of detrimental effects of reclaims on financial hardship are the Australian Robodebt scandal and the Dutch benefits scandal. In both scandals, tens of thousands of welfare recipients got unjust reclaims[23,24]. Even years later, victims of those two scandals still suffer from financial hardship, anxiety, depression, and ill health[25,26].

We argue that households may refrain from taking up social welfare after a reclaim. Having experienced the negative impact of a financial shock, eligible households may perceive the anticipation of a future reclaim as a direct threat to their well-being that they wish to avoid. This proposition would fit with models of psychological stress and coping[27–29]: anticipating a future financial shock is appraised as a threat to one's well-being. This appraisal may trigger anxiety[30,31]. In response to this anxiety, avoidance may be used as a coping mechanism[32].

These insights suggest that eligible households may forgo social welfare to avoid the perceived threat associated with reclaims and the resulting anxiety, despite that such a non-take up decision may worsen their financial hardship.

While empirical studies directly demonstrating the effect of reclaims on non-take-up remain scarce, two qualitative studies conducted in the Netherlands suggest that reclaims may lead to non-take-up. From a qualitative interview study among local policymakers and street-level bureaucrats in six Dutch municipalities, Tempelman et al.[33] concluded that low-income households that experienced a reclaim often refrained from applying for future benefits. In a qualitative interview study among low-income households in two Dutch cities, Simonse et al.[20] found that low-income families reported past experiences of reclaims as the primary reason for avoiding the take-up of social welfare.

The current research

To our knowledge, no quantitative studies have examined the effect of reclaims on subsequent non-take-up of social welfare. In the current research, we conducted two studies in which we experimentally tested whether reclaims increased the likelihood of non-take-up of social welfare. In addition, we tested whether this effect was moderated by being indebted. Results of previous studies indicated that debts may result in decreased well-being and happiness[34,35] and increased financial stress and mental health issues[36–38]. Therefore, we expected the impact on non-take-up to be more pronounced when reclaims caused a debt.

The two studies employed an experimental task to examine the effect of reclaims on take-up decisions. We adopted the Household Task, an experimental paradigm where participants manage a household's finances[39]. In this task, participants receive a salary and must pay expenses during a series of rounds representing one month. To study the effect of reclaims, we adapted this paradigm so that participants received social welfare in each round to make ends meet[a]. After

a Before implementing the paradigm presented here, we performed two initial tests. We tested whether the instructions were clear and whether the manipulations worked. Also, we aimed to gain insight into whether participants experienced the social welfare as unpredictable and helpful. Based on the tests, we adapted the instructions to make them clearer. We observed that participants that did not have to pay a reclaim all continued using take-up. Non-take-up was considerable among participants that had to pay a reclaim, especially those that were indebted after the reclaim. These findings suggest that the manipulations worked. The procedure and data of the tests are available on the Open Science Framework (*osf.io/xsvug/*). These initial tests were approved by the Leiden University Psychology Research Ethics Committee.

six rounds, participants either did or did not have to pay a reclaim of their social welfare. Next, participants were asked whether they wished to continue receiving social welfare in the subsequent rounds.

In Experiment 2, we added a condition where participants experienced a financial shock not due to reclaim of received social welfare (i.e., they unexpectedly had to pay a garage bill). This enabled us to assess whether the effect of a reclaim was more than merely a response to a financial shock.

Both experiments tested the following hypotheses:

- **Hypothesis 1.** Compared to participants who do not have to pay a reclaim of social welfare, those who have to pay a reclaim are less likely to take up social welfare subsequently.
- **Hypothesis 2.** The effect of paying a reclaim on subsequent non-take-up of social welfare is stronger for indebted participants than for not-indebted participants.

Experiment 2 additionally tested the following hypothesis:

- **Hypothesis 3.** Compared to participants who experience an unrelated negative financial shock, those who have to pay a reclaim of social welfare are less likely to take up social welfare subsequently.

STUDY 1

In the first study, we tested our first two hypotheses. We preregistered our hypotheses, experimental design, and analysis plan on the Open Science Framework (*osf.io/fsauy*). The materials, data, code, and results are also available on the OSF (*osf.io/7qw6m/*). The experiment was approved by the Leiden University Psychology Research Ethics Committee.

Participants and design

Participants were randomly assigned to one of the four conditions of a 2 (financial shock: reclaim vs. no reclaim) by 2 (debt: yes vs. no) between-participants design. A sensitivity power analysis, with medium effect size (w = .3), type I error probability α = .05, and power 1-β = 0.95, using G*Power (Faul, Erdfelder, Lang, & Buchner, 2007) indicated a required sample of 191. To allow for some dropout, we recruited 200 British participants via the online platform Prolific Academic, of whom 198 completed the study. After removing data from one participant who failed the attention check and four who skipped at least one work task, data from 193 participants remained. Of these participants, 80 were male (41%), 111 were female (58%), one had non-binary/third gender (0.5%), and one preferred not to say (0.5%). Participants' mean age was 37 years (*SD* = 12), and their mean income was £ 3,341 (*SD* = 1,264). Participants' understanding of the instructions was high (the mean score was 6.23 on a 7-point scale, *SD* = 0.81). Participants received incentivized payments based on the outcome of the task. In addition to a fixed payment of £ 2.25, participants could earn a bonus reward of £ 1.00 if they ended the task with a positive balance. Participants only ended with a positive balance if they continued to take up social welfare.

Procedure

Figure 1 visualizes the procedure. After providing informed consent, participants received a general instruction in which they learned how their incentivized payment would be determined. Participants were asked whether the instructions were clear, after which they received an introduction to the Household Task and completed a practice round. In our version of the paradigm, participants first played six rounds, where each round represented one month. Each round started with performing a work task: typing five ten-character strings backward. Next, participants were informed about their salary, expenses, and social welfare and received a financial overview, including a balance. In all conditions, salary was set at £ 1,525 per month, corresponding to 75% of median disposable income in the UK in 2022. Expenses were set at £ 2,010 per month, so participants would have

a considerable negative monthly balance if they did not receive social welfare. Social welfare was manipulated between conditions. Condition 1 (no reclaim, no debt) received £ 490 social welfare per month, condition 2 (no reclaim, debt) received £ 440 per month, condition 3 (reclaim, no debt) received £ 740 per round, and condition 4 (reclaim, debt) received £ 690 per month.

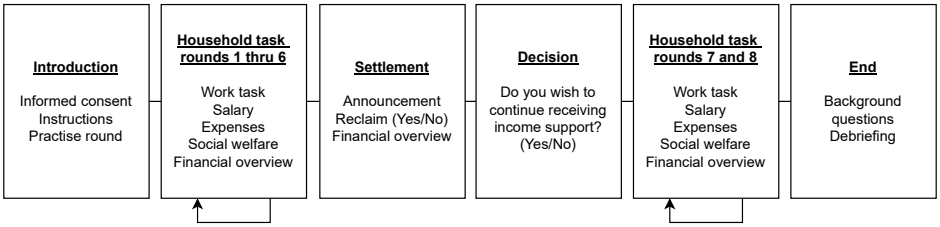

Figure 1. The procedure of the Household Task. Experimental manipulation took place by (1) presenting versus not presenting participants with a reclaim in the settlement stage and (2) varying the amount of social welfare, as a result of which participants became indebted versus not indebted. In Study 2, a third condition was added in the settlement stage: some participants received a bill from the garage instead of a reclaim.

After six rounds, we introduced a settlement stage during which participants learned whether they would have to pay a reclaim. This phase was used for manipulating financial shock. Participants in the reclaim condition received a statement that they had to pay a reclaim of £ 1,500. In contrast, participants in the no reclaim condition received a statement that they did not have to pay a reclaim. After the settlement stage, the two no-debt conditions had a positive balance of £ 30, whereas the two debt conditions had a negative balance of £ 270. Therefore, the two no-debt conditions had the same financial balance after six rounds, as did the two debt conditions.

Next, we presented an attention check and an updated financial overview, including a balance. Participants were then asked whether they wished to continue receiving social welfare in the upcoming rounds and were reminded that a settlement would occur again after six months. Participants performed two more rounds of the Household Task. After that, the experiment ended, and participants were asked to provide their age, income, and gender (all optional). After that, they were informed about their payment and debriefed. The average completion time of the study was 19 minutes.

Analyses

To test hypotheses 1 and 2, we performed a logistic regression with take-up of social welfare as a dichotomous dependent variable. The dichotomous independent variables were financial shock (reclaim vs. no reclaim), debt (yes vs. no), and the interaction between financial shock and debt[b].

Results

Overall, non-take-up of social welfare among participants was 21% (Table 1). Non-take-up differed considerably between conditions. Non-take-up was higher for participants who had experienced a reclaim (35%) than for participants who had not experienced a reclaim (6%). For the two reclaim conditions, non-take-up was 41% in the debt condition and 29% in the no-debt condition.

Table 1. Non-take-up in the four conditions (Study 1).

		Financial shock		
		Reclaim	**No reclaim**	**Total**
Debt	**No**	16 / 51 (29%)	2 / 50 (2%)	17 / 101 (17%)
	Yes	19 / 46 (41%)	4 / 46 (9%)	23 / 92 (25%)
	Total	34 / 97 (35%)	6 / 96 (6%)	40 / 193 (21%)

Note: The cells in the table contain a / b (c%), where a is the number of participants in the respective condition that did not continue to take up social welfare, b is the total number of participants in the condition, and c is the non-take-up percentage.

Results of the logistic regression showed a significant main effect of financial shock (Table 2, B = -2.30, p = .003). Supporting Hypothesis 1, participants who had to pay a reclaim were less likely to continue taking up social welfare than participants who did not have to pay a reclaim. Results showed no main effect of debt (B = -0.83, p = .354) and no interaction between financial shock and debt (B = 0.30, p = .760). The latter result contrasts Hypothesis 2.

b We preregistered a separate logistic regression with only financial shock (reclaim and no reclaim) as an independent variable to test Hypothesis 1 and a logistic regression for the full model to test Hypothesis 2. These analyses, available on the Open Science Framework, gave the same results.

Table 2. Logistic regression for Hypotheses 1 and 2 in Study 1.

	B	**σ**	***z***	***p***
(Intercept)	3.18	.72	-4.40	< .001
Financial shock: reclaim	-2.30	.78	2.94	.003
Debt: yes	-.83	.89	.93	.354
Financial shock * Debt	.30	.99	-.31	.760

Note: The model contained non-take-up as the dependent variable and financial shock), debt, and the interaction between shock and debt as the independent variables. The columns contain the regression parameter (B), standard error (σ), Wald 's test statistic (z), and p-value (p).

We performed an exploratory contrast analysis (see Appendix, Tables A1 and A2). Results showed that there was a significant difference in non-take-up between those who had to pay a reclaim and those who did not for both the no debt condition (B = -2.30, p = .003) and the debt condition (B = -2.00, p < .001). Also, results did not show significant differences in non-take-up between those who were indebted versus those who were not indebted for either the reclaim condition (B = -.52, p = .222) or the no reclaim condition (B = -.83, p = .354). These findings corroborated the results of the main analyses.

Discussion

Results of Study 1 showed that reclaims increased non-take-up of social welfare (Hypothesis 1). We found no support for a moderation effect of indebtedness (Hypothesis 2).

STUDY 2

The second experiment was a replication and extension of the first. In this experiment, we included an extra financial shock condition, where participants were presented with an unexpected garage bill (hereafter bill condition). The height of this bill was equivalent to the reclaim in the other financial shock condition. The primary objective of including the bill condition was to test whether the effect of a financial shock on taking up social welfare was specific to a reclaim. The debt manipulation (yes vs. no) was identical to Study 1. In Study 2, we thus tested Hypotheses 1 through 3. We preregistered the hypotheses, experimental design, and analysis plan on the OSF (*osf.io/c3b8h*). The materials, data, code, and results are available on the OSF (*osf.io/4g36m/*). The experiment was approved by the Leiden University Psychology Research Ethics Committee.

Participants and Design

Based on a power analysis similar to that of Study 1, we recruited 300 British participants via the online platform Prolific Academic. Participants of Study 1 were not allowed to participate in Study 2. Of the recruited participants, 299 completed the study. Data of 20 participants were excluded: six failed the attention check, and fourteen skipped at least one work task. Of the remaining 279 participants, 101 were male (36%), 171 were female (61%), 5 had non-binary/third gender (1.8%), and 2 preferred not to say (0.7%). The mean age of participants was 40 years (*SD* = 13), and their mean income was £ 3,120 (*SD* = 1,270). Study 2 had a 3 (financial shock: reclaim vs. no shock vs. bill) by 2 (debt: yes vs. no) between-participants design.

Procedure

As the procedure of Study 2 was similar to that of Study 1, we describe only the differences here. Results of Study 1 showed that the instructions were clear to the participants. Therefore, we did not verify this again in Study 2. After the sixth round, participants in the no shock and the bill condition received a statement that they did not have to pay a reclaim. Next, those in the bill condition received a statement that they had to pay a bill from the garage. The height of this bill was equal to the height of the reclaim in the reclaim condition. The average completion time of the study was 18 minutes.

Analyses

To test Hypotheses 1 through 3, we performed a logistic regression with non-take-up of social welfare as a dichotomous dependent variable. We included financial shock in the form of dummy variables ("reclaim," "no shock," and "bill," where

"reclaim" served as the reference category)[c]. Debt was included in the form of dummy variables ("yes" and "no," where "no" was the reference category). In addition, we included the interaction between financial shock and debt using the same dummy variables.

Results

Overall, the non-take-up of social welfare among the participants was 15%. Non-take-up differed considerably between groups (Table 3). Participants who had to pay a reclaim had the highest average non-take-up rate (31%), compared to 9% for the participants who experienced no financial shock and 4% who received an unexpected garage bill. For participants who had to pay a reclaim and had a debt, the non-take-up was 43%, whereas the non-take-up rate was 23% for participants who had to pay a reclaim but had no debt.

Table 3. Non-take-up in the six conditions (Study 2).

		Financial shock			
		Reclaim	**No shock**	**Garage bill**	**Total**
Debt	**No**	12 / 53 (23%)	4 / 60 (7%)	1 / 45 (2%)	17 / 158 (11%)
	Yes	17 / 40 (43%)	5 / 44 (11%)	2 / 37 (5%)	24 / 121 (20%)
	Total	29 / 93 (31%)	9 / 104 (9%)	3 / 82 (4%)	41 / 279 (15%)

Note. The cells in the table indicate per condition, the number of participants who did not want to continue to take up social welfare, the total number of participants, and the percentage of non-take-up, respectively.

Results of the logistic regression showed a significant main effect of financial shock. Participants in the reclaim condition were less likely to continue to take social welfare than participants in the no shock condition (B = -1.41, p = .021) or participants in the bill condition (B = -2.56, p = .016) (Table 4), supporting Hypotheses 1 and 3. Results showed no significant interaction effects (B = -.341, p = .684 and B = -.004, p = .997 for the no shock and the garage bill conditions, respectively (Table 5), in contrast with Hypothesis 2. However, results showed a significant main effect of debt (B = .926, p = .043). Participants in the debt conditions were less likely to continue to take up social welfare than those in the no debt conditions.

c We preregistered separate logistic regressions for the two no shock and bill conditions. These analyses, available on the Open Science Framework, gave the same results.

Table 4. Logistic regression for Hypotheses 1, 2 and 3 in Study 2.

	B	***σ***	***z***	***p***
(Intercept)	-1.23	0.33	3.74	< .001
Financial shock: no shock	-1.41	0.61	2.30	0.021
Financial shock: bill	-2.56	1.06	2.40	0.016
Debt: yes	0.93	0.46	-2.02	0.043
Financial shock: no shock * debt	-0.34	0.84	0.41	0.684
Financial shock: bill * debt	-0.00	1.33	0.00	0.997

Note: The model contained take-up as the dependent variable and financial shock (reclaim vs. no shock vs. bill), debt (yes vs. no), and the interaction between financial shock and debt as the independent variables. The columns contain the regression parameter (B), standard error (σ), Wald's test statistic (z), and p-value (p).

We performed exploratory contrast analysis (see online materials on OSF). Results showed a significant difference in non-take-up between participants in the reclaim condition and those in the no shock or the bill condition. This was the case in both the debt and no debt conditions. Furthermore, among participants who had paid a reclaim, non-take-up was significantly higher for participants who were in the debt condition than those who were in the no debt condition (B = -.93, p = .043). So, although the data did not support debt being a moderator of the effect of reclaims on non-take-up, the exploratory analysis suggests that, for those in the reclaim condition, non-take-up was higher among indebted versus non-indebted participants.

Combined data from studies 1 and 2

In a last exploratory analysis, we combined the data of both experiments, except for the data from the bill condition in Study 2 (N = 390), allowing us to leverage statistical power (Appendix, Tables A5 through A7). Results showed a significant main effect of financial shock (B = -1.81, p < .001). Participants in the reclaim condition were less likely to continue to take social welfare than participants in the no shock condition. Results neither showed a main effect of debt (B = -.66, p = .231) nor an interaction between financial shock and debt (B = -.06, p = .919). Post-hoc contrast analyses did show a significant difference between the no debt and debt condition for participants in the reclaim condition (B = -.72, p = .021). So, although the data did not support debt being a moderator of the effect of reclaims on non-take-up, the exploratory contrast analysis indicated that, for those in the reclaim condition, non-take-up was higher among indebted versus non-indebted participants.

Discussion

From Study 2, we conclude that participants who had to pay a reclaim had higher non-take-up rates for social welfare than participants who experienced no financial shock (Hypothesis 1) or received a bill unrelated to social welfare (Hypothesis 3). The data do not support an interaction effect of reclaims and debts on the non-take-up of social welfare (Hypothesis 2). However, post-hoc contrast analyses showed that – within the group of participants who had to pay a reclaim – indebted participants had significantly higher non-take-up than non-indebted participants.

GENERAL DISCUSSION

Many eligible households do not take up social welfare. To investigate whether reclaims might help explain this phenomenon, we conducted two incentivized experiments in which participants performed a task that simulated managing a household's finances. In the task, participants performed work, received a salary, and had to pay expenses. As their expenses exceeded their incomes, participants received social welfare to help them make ends meet. Some participants received the correct amount social welfare see supplemental materials, whereas others received too much social welfare and had to pay a reclaim. Also, we manipulated the amount of social welfare participants received. Consequently, some participants were indebted at the end of the task, whereas others were not. In Study 1, the financial shock consisted of a reclaim, whereas in Study 2 the financial shock was either a reclaim or a garage bill.

Results showed an increase in non-take-up after a reclaim of social welfare. Participants who had to pay a reclaim had considerably higher non-take-up than those who did not. The effect of being indebted on non-take-up was less clear. We found no statistically significant interaction between financial shock and debt in both studies. In Study 2 and the data combining the two studies, we found, however, that when participants had to pay a reclaim, they were less likely to take up subsequent social welfare if they were indebted by the reclaim than if they were not indebted. The main conclusion of our current research is that households may refrain from taking up social welfare after having to pay a reclaim. Whether being indebted due to a payment of a reclaim strengthens the effect of a reclaim on non-take-up received some preliminary support. More research is needed, however, to arrive at more definite conclusions on the effects of indebtedness on non-take-up.

Strengths, limitations, and suggestions for further research

The current research has several strengths. First, to our knowledge, our studies are the first experiments that examine a causal relation between reclaims and non-take-up of social welfare. Establishing a causal link between reclaims and non-take-up is especially relevant in social welfare systems that attempt to be responsive to the changing circumstances of eligible households. A particular challenge of such systems is that they may result in overpayments and, hence, in reclaims. Second, the task we used in which participants allegedly manage their household finances enabled us to simulate experimentally difficult-to-test situations in the field. Conducting real-life experiments would require randomly

giving some eligible households too much social welfare and confronting them with a reclaim. Such a research approach encounters both practical and ethical objections. Our experimental approach can help policymakers develop better policies by testing them in a controlled setting.

An important limitation of the current research concerns the applicability to real-life situations. First, compared to our experimental paradigm, people may have more control over their expenses in real life and might be able to take preventive measures to avoid reclaims. Future research could incorporate such aspects in an experimental paradigm, like the one we used, and assess their impact in a controlled setting. Second, our experiments simulated households' incomes, expenses, and social welfare. The outcomes of these simulations did not affect participants' actual financial situation, except for a relatively small payment that depended on their performance in the task. Future research could use administrative data to examine whether the association between reclaims and take-up we found in our research is corroborated by these data about people's actual lives.

The underlying mechanisms in the causal relationship between reclaims and take-up remain unanswered. Several studies have explored the anxiety associated with potential reclaims, but none of them established a link with non-take-up. To illustrate, in a quantitative study among eligible households, Simonse et al.[40] found no support for an association between reclaim anxiety and non-take-up of health care or child support benefits. Moreover, in a qualitative study, Garthwaite[41] observed more anxiety and uncertainty among long-term receivers of illness benefits in the UK. Her study took place against the backdrop of extensive welfare reform with stricter eligibility conditions. The expressed anxiety in this study was associated with the prospect of being reassessed, which could result in not receiving illness benefits in the future. Also, this study did not establish a link between anxiety and non-take-up. Future research could examine this link further as a possible mediating role of anxiety avoidance in the relation between reclaim and non-take-up fits with models of psychological stress and coping[27–29].

Finally, the moderating role of being indebted after a reclaim deserves further research. Although our research provided some preliminary support for this role, more research is needed to arrive at more definite conclusions. In our current research, the amount of debt was relatively small (approximately 12% of total monthly income). Future research could include larger debts in an experimental setting and test whether larger debts provide a clearer picture of the role of being indebted in the relation between reclaims and non-take-up.

Potential implications for policy

In our studies, participants simulated managing the finances of a financially vulnerable household. They received a salary of 75% of median disposable income in the UK, and their expenses were higher than their salaries. Therefore, they needed social welfare to make ends meet. The situation we simulated in our experiments resembles that of many households eligible for social welfare. Results showed that overpayments followed by reclaims resulted in more non-take-up, which, in turn, worsened already worrisome financial situations. That is, those who chose to forego social welfare were worse off than those who continued taking up social welfare. Our results indicate that well-intended policies may have counterproductive effects on some vulnerable groups. Responsiveness in social welfare is meant to better align with financially vulnerable households' changing circumstances. However, this responsiveness might make overpayments and underpayments unavoidable. Our results suggest that the reclaims accompanying overpayments may result in non-take-up of social welfare. This means that the responsiveness in social welfare, although well-intended, may increase rather than decrease the financial vulnerability of some households. This is in line with our own (qualitative) research, in which we showed that financially vulnerable households were reluctant to use social welfare because of negative experiences with reclaims[20].

Previous studies indicate that households in financial stress may display economically adverse behaviors, such as avoiding financial information, delaying financial decisions, impulsive buying, gambling, overspending, suboptimal investing, decreased job search effectiveness, and overborrowing[42–47]. Our current research adds to the literature by showing that non-take-up of social welfare could be another behavior negatively affected by financial stress. Moreover, it hints at the possibility that this effect might perpetuate financial hardship and contribute to a poverty trap.

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CHAPTER 7. APPENDIX
EXPLORATORY ANALYSES

We performed a contrast analysis using the R-package *emmeans*[1]. We used pairwise comparisons and applied Holm's adjustment for performing multiple parallel analyses. We performed these analyses for Study 1, Study 2 and the combined data from Studies 1 and 2. For the latter, we also repeated the main analyses of Studies 1 and 2.

Study 1

Table A1. Contrast analyses for Study 1, based on Debt (Yes/No).

Contrast	Debt	estimate	SE	z.ratio	p.value
ReclaimYes - ReclaimNo	No	2.3	0.78	2.94	.003
ReclaimYes - ReclaimNo	Yes	2.0	0.60	3.32	< .001

Table A2. Contrast analyses for Study 1, based on Financial shock (Reclaim/No shock).

Contrast	Financial shock	estimate	SE	z.ratio	p.value
DebtYes - DebtNo	No shock	0.83	0.89	0.93	.354
DebtYes - DebtNo	Reclaim	0.52	0.43	1.22	.222

Study 2

Table A3. Contrast analyses for Study 2, based on Debt (Yes/No).

Contrast	Debt	estimate	SE	df	z.ratio	p.value
None - Reclaim	No	-1.41	0.61	Inf	-2.30	.049
Bill - Reclaim	No	-2.56	1.06	Inf	-2.40	.049
Bill - None	No	-1.15	1.14	Inf	-1.01	.313
None - Reclaim	Yes	-1.75	0.57	Inf	-3.06	.004
Bill - Reclaim	Yes	-2.56	0.79	Inf	-3.22	.004
Bill - None	Yes	-0.81	0.87	Inf	-0.93	.352

Table A4. Contrast analyses for Study 2, based on Financial shock (Reclaim/No shock/Bill).

Contrast	Shock	estimate	SE	df	z.ratio	p.value
Yes - No	Reclaim	0.93	0.46	Inf	2.02	.043
Yes - No	None	0.58	0.70	Inf	0.83	.405
Yes - No	Bill	0.92	1.25	Inf	0.74	.459

COMBINED DATA FROM STUDIES 1 AND 2

Table A5. Logistic regression for the combined data from Studies 1 and 2.

	B	***σ***	***z***	***p***
(Intercept)	-2.853	0.420	-6.794	< .001
ShockReclaim	1.805	0.476	3.794	< .001
DebtYes	0.655	0.547	1.197	.231
ShockReclaim:DebtYes	0.064	0.631	0.102	.919

Note: The model contained non-take-up as the dependent variable and financial shock), debt, and the interaction between shock and debt as the independent variables. The columns contain the regression parameter (B), standard error (σ), Wald 's test statistic (z), and p-value (p).

Table A6. Contrast analyses for the combined data from Studies 1 and 2, based on Debt (Yes/No).

Contrast	**Debt**	**estimate**	**SE**	**df**	**z.ratio**	**p.value**
Reclaim – None	No	1.80	0.48	Inf	3.79	< .001
Reclaim – None	Yes	1.87	0.41	Inf	4.52	< .001

Table A7. Contrast analyses for the combined data from Studies 1 and 2, based on Financial shock (Reclaim/No shock).

Contrast	**Shock**	**estimate**	**SE**	**df**	**z.ratio**	**p.value**
Yes - No	None	0.66	0.55	Inf	1.197142	0.231
Yes - No	Reclaim	0.72	0.31	Inf	2.300572	0.021

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Chapter 8

Summary and conclusion

Financial scarcity, characterized by insufficient financial resources, poses challenges that individuals and households face in fulfilling their basic needs[1–4]. The consequences of financial scarcity extend beyond mere monetary constraints and may negatively affect emotions, thoughts, and behavior, as well as well-being and health[5–7]. Financial scarcity may result in financial stress, which comprises an appraisal of insufficient financial resources, a perceived lack of control over one's financial situation, financial worry and rumination, and a short-term focus[8].

Social welfare systems can play a pivotal role in decreasing financial scarcity by providing low-income households with the resources needed to acquire their basic needs. Social welfare can help households make ends meet and alleviate financial stress. However, non-take-up of social welfare is widespread and inhibits its effectiveness in mitigating financial scarcity and alleviating financial stress[9–11].

This dissertation aimed to enhance our understanding of the dynamic relationship between financial stress and mental well-being, unravel the economic predictors of financial stress, and extend existing research on the determinants of the non-take-up of social welfare as a policy tool for alleviating financial stress.

The first part of this dissertation focused on financial stress, particularly the dynamic relationship between financial stress and mental health, and the association between households' economic situation and financial stress. Previous studies have shown that financial stress relates to mental health problems such as anxiety and depression[12–14]. Most studies, so far, have been cross-sectional. The longitudinal study in Chapter 2 extended the existing literature by examining the dynamic association between financial stress and mental health during the COVID-19 pandemic.

I then delved deeper into the association between households' economic circumstances and financial stress. The literature on mental health and financial stress shows that different aspects of households' economic situation may contribute to financial stress[15–22]. Thus far, however, these factors have usually been studied in isolation. The study described in Chapter 3 took a more integrative perspective by examining how five aspects of one's economic situation - income, debts, savings, income volatility, and employment - related to financial stress. This allowed an examination of the relative contributions of these economic factors to predicting financial stress.

The second part of this dissertation focused on the non-take-up of social welfare. Social welfare can help households mitigate the negative consequences of financial scarcity and alleviate financial stress. Non-take-up may hinder the mitigating role of social welfare. Chapters 4 through 7 aimed to address several gaps in the non-take-up literature.

The research on non-take-up, spanning decades and diverse disciplines, such as economics, sociology, and public administration, has benefited from recent insights from psychology. These insights have revealed additional potential inhibitors of take-up, including administrative burden and fear of reclaims[23–26]. The lack of a systematic review of the last decade's literature presents a vital gap. Chapter 4 addressed this gap with a systematic review of non-take-up literature, resulting in a new theoretical framework that can guide future research, policy, and practical applications in social welfare.

A second gap in the literature on the non-take-up of social welfare is its reliance on quantitative studies, with limited attention to qualitative research. Understanding the more nuanced, subjective aspects of participating in social welfare requires qualitative insights. Chapter 5 presented the findings of a qualitative interview study among low-income households in two Dutch cities, enriching our understanding of welfare participation experiences.

Third, although insights from psychology have advanced our knowledge of non-take-up, empirical evidence is fragmented, with studies often including one or two factors inhibiting welfare participation. Existing research lacked an integrative framework to reveal the relative contributions of different psychological factors in explaining non-take-up. Chapter 6 addressed this gap by integrating theoretical and empirical findings into one model and examining the combined influence of psychological factors on the non-take-up of healthcare and child support benefits, thereby shedding light on their relative strengths in explaining non-take-up.

My final study focused on the psychological effects of reclaims resulting from overpayments as a potential cause of non-take-up. Reclaims result from governments attempting to develop welfare policies that ensure better and quicker alignment with households' dynamic financial situations[27]. Increased income volatility in recent years may have resulted in a greater prevalence of reclaims[27]. Empirical studies directly examining the effect of reclaims on

non-take-up are scarce and have thus far employed a qualitative approach[26,28]. The last study, reported in Chapter 7, described the results of an experimental study of the effect of reclaims on the non-take-up of social welfare.

In this final chapter, I summarize the research findings and provide potential future directions for studying financial stress and the non-take-up of social welfare. I then outline the challenges that policymakers face when shaping the future of social welfare and draw on the lessons derived from the reported research to inform the design of social security systems that minimize non-take-up. I place my findings in the context of two global trends in social welfare: (1) the shift from fighting poverty to austerity and labor force activation and (2) the impact of digitalization on the welfare state. I conclude that building simpler, more accessible social welfare systems may help financially vulnerable households reduce financial stress, improving their mental and physical health and overall well-being.

SUMMARY

This section summarizes the results of this dissertation's studies and provides directions for future research.

Part I: Financial stress (Chapters 1 and 2)

Chapter 2 examined the connection between financial stress and mental health in the early stages of the COVID-19 pandemic in a probability sample of Dutch households (*N* = 1,114). The longitudinal study showed that, on average, mental health remained stable, but individual experiences varied considerably. Financial stress played a crucial role, as increased stress was linked to declining mental health, while reduced financial stress was related to improved mental health. Notably, income was not the primary factor explaining changes in financial stress; instead, having fewer savings and more debts was associated with increased financial stress, which was, in turn, related to decreased mental health.

Chapter 3 examined the association between economic conditions and financial stress, using the same sample as Chapter 2. I focused on income, savings, debts, income volatility, and employment. The cross-sectional study showed that income and savings were the strongest predictors of financial stress, both positively associated with financial stress. The number of debts played a smaller but significant role; having fewer debts was associated with more financial stress. Employment negatively predicted financial stress, but only for low-income households. I found no evidence for debt amounts and income volatility predicting financial stress.

For the association between financial stress and mental and physical health, I suggest several avenues for future research. It would be beneficial to extend the study of financial stress and mental health development over more prolonged periods, going beyond the COVID-19 pandemic. Also, I suggest examining the effects of financial stress on a broader spectrum of mental health symptoms and disorders, such as post-traumatic stress, insomnia, and loneliness[29–33]. Extensive research exists on the link between socioeconomic status and physical health, encompassing cardiovascular disease, arthritis, diabetes, chronic respiratory diseases, and cervical cancer[12,34]. Investigating the enduring impact of financial stress during and following COVID-19 on these conditions may offer valuable insights into unraveling the intricate connection between socioeconomic status, lifestyle, and health.

Shifting the focus to the predictors of financial stress, I suggest broadening the scope beyond the variables included in my model. The current study incorporated five economic variables - income, savings, debts, income volatility, and employment – and demographic variables - age, gender, education level, and household size. Other factors, like financial literacy, financial attitudes, and self-efficacy, could also be considered, especially in combination with economic factors. To enhance the robustness of findings and establish causal relationships, I suggest longitudinal studies and (quasi) experiments of the association between socioeconomic variables, financial stress, and health outcomes. Furthermore, I suggest examining the impact of various types of debts on financial stress and the temporal relationship between one's economic situation and future financial stress. Finally, future studies could make cross-cultural comparisons, examining the associations between economic factors and financial stress in different economic and cultural contexts.

PART II: Non-take-up of social welfare (Chapters 4 through 7)

Chapter 4 aimed to identify determinants of the non-take-up of social welfare by conducting a systematic scoping review of the literature of the last ten years in developed countries. I provided a new theoretical framework of non-take-up for policy and future research, comprising factors on four levels: societal, administration, social, and individual. Limited evidence was found for factors at the societal level. Administration-level factors like complex procedures and eligibility information strongly influence non-take-up, while other behavioral interventions have limited effect. Social networks affect non-take-up, whereby proposed mechanisms identified include information spillover[35,36], support[35,37], and social norms[38,39], but the evidence is mixed and mostly indirect.

Chapter 5 studied low-income households' experiences with social welfare in the Netherlands. In a qualitative study, 31 low-income individuals were interviewed in two major cities in the Netherlands, The Hague and Eindhoven. Financial stress was revealed to be common among participants. Fear of social welfare reclaims and distrust in government institutions were the main barriers to the take-up of social welfare. Shame and stigma affected the take-up of local but not national welfare programs. Formal and informal support systems encouraged participation, but many lacked access to such support.

Chapter 6 empirically tested an integrated model for take-up of healthcare and child support benefits in a sample of eligible Dutch households (N = 905) using a cross-sectional survey study. The findings indicated that participants' perceptions

of eligibility were the main factor explaining healthcare and child support benefits take-up. Additionally, take-up was related to the perceived need for healthcare benefits. Exploratory analyses suggested that executive functions, self-efficacy, fear of benefit reclaims, financial stress, and welfare stigma explained perceived eligibility for healthcare benefits but not perceived eligibility for child support benefits. The data did not show an association between knowledge, social support, and administrative burden on the one hand and perceived eligibility on the other.

Chapter 7 reported two preregistered experiments to investigate the effect of reclaims on social welfare non-take-up. Participants were recruited from the U.K. (total N = 472). Results from both experiments demonstrated that reclaims increased subsequent social welfare non-take-up. I found preliminary evidence for an effect of indebtedness on reclaims' impact on non-take-up. The adverse effect on non-take-up was specific to reclaims, as a similar financial shock caused by an unrelated event did not affect non-take-up.

For research on non-take-up, I suggest several directions for further research. Many studies in the literature use one particular welfare program as a starting point. Adopting a more integrative approach by starting from the experiences and needs of individual households rather than specific welfare programs could provide a better understanding of non-take-up. Investigating the interplay between determinants at the policy and administration (e.g., rule complexity) and individual levels (e.g., administrative burden, information cost, and stigma) is another potential avenue for future research.

Factors such as societal determinants, economic circumstances, social and legal contexts, political ideology, and media coverage have had little research attention. Future studies could examine their effects on non-take-up in different cultural and regulatory contexts. I also suggest future studies to build upon the current finding that reclaims may contribute to non-take-up by examining potential underlying mechanisms, such as reclaim anxiety. Future studies could also use administrative data to examine whether this finding replicates using information from people's real life situations. Furthermore, I suggest developing a standardized vocabulary and measurement instrument for welfare take-up. This standardization would facilitate the comparability of findings and generalizability of results. Finally, I encourage developing and testing interventions to increase take-up, using the current studies' findings, a topic that I will further elaborate on in the subsequent section.

POTENTIAL IMPLICATIONS FOR SOCIAL WELFARE POLICY

Current challenges in social welfare

Social welfare can provide income security to vulnerable households and may thereby contribute to preventing financial stress and decreasing poverty. The effectiveness of social welfare in alleviating poverty and financial stress depends on its accessibility to those who need it[40]. Many households, however, do not take up the social welfare for which they are eligible. Accessibility of social welfare faces two key challenges.

First, welfare systems worldwide have transitioned from poverty alleviation to prioritizing labor force activation and economic efficiency, especially during economic downturns. Simultaneously, welfare systems have been utilized to facilitate people's entry into the workforce[41–44].

This shift has led to stricter eligibility criteria[43,45–50], focusing on work requirements[44,51,52]. This emphasis on activation policies and economic efficiency aligns with the broader trend of austerity and welfare state retrenchment observed since the 1980s[42]. The literature indicates that, apart from short-term fluctuations, there was a nearly widespread rise in Western European working-age benefit caseloads until the early 1980s, followed by consolidation[9,53]. Since then, retrenchment has predominated, leading to stricter eligibility rules[43]. Stricter eligibility rules, while increasing economic efficiency and labor force activation, inadvertently resulted in higher non-take-up rates[45]. This finding is particularly concerning given the identified deservingness gap, where immigrants and certain groups are perceived as less deserving[50]. The shift towards emphasizing individual responsibility and activation in welfare discourses may create challenges in ensuring those in need can access the support they require.

Second, digitalization is transforming the welfare state, automating and streamlining processes[54,55], and increasing the demand for internet access and digital skills[56]. The shift of responsibilities from the government to individuals through self-service mechanisms can overwhelm households already burdened with various administrative tasks, leading to non-take-up[57–59]. Also, automated welfare systems are often rigid and fail to take real-life situations into account[56]. Scholars have argued that welfare digitalization can amplify existing patterns of inequality because digital exclusion tends to correlate with socioeconomic status. Scholars have also argued that welfare digitalization can create new inequalities between social groups[55,58,60].

These two trends may increase non-take-up, endangering two aims of social welfare: alleviating poverty and decreasing financial stress. This may particularly impact groups facing other societal challenges, such as the unemployed and immigrants[51,52].

Future social welfare reforms

Social protection plays a key stabilizing role for individuals and societies. The comprehensive support packages implemented by governments following the unprecedented COVID-19 pandemic shocks have demonstrated this.

The structural transformations driven by digitalization and the evolving nature of work have profound implications for social welfare systems[40,61,62.] With less stable career patterns and the rise of new employment forms, traditional models of social protection tied to stable, long-term employment may become less effective. The gig economy, characterized by short-term, flexible jobs, often mediated by digital platforms, where individuals work as freelancers or independent contractors on a project or task basis, often lack the same social benefits, such as health insurance, retirement plans, and unemployment benefits, which are commonly associated with traditional full-time employment.

As a result, there is a growing need to reassess and adapt social welfare policies to accommodate the changing work landscape. Policymakers may need to explore innovative solutions to ensure that individuals engaged in non-traditional work benefit from adequate social safety nets. This could involve developing transferable benefits accompanying workers across different jobs, enhancing social insurance mechanisms, and exploring new ways to support workers during transition or unemployment.

In summary, the changing nature of work necessitates reevaluating and adapting social welfare systems to ensure they effectively support individuals in an environment characterized by digitalization, flexible work arrangements, and evolving career patterns.

To guarantee that social welfare can stabilize individuals and societies, governments should prioritize safeguarding the financial security of vulnerable households. The trends mentioned above go in the opposite direction: austerity and digitalization have priority on the policy agenda, potentially endangering the take-up of social welfare. These ultimately constitute political choices, but policymakers should recognize that these policies may have unintended side

effects, putting financial resilience and, consequently, the mental and physical well-being of vulnerable citizens under pressure, which could give rise to high societal costs. The studies of this dissertation provide insights that can help design more effective social welfare systems. I highlight a few key insights, focusing on reducing the complexity of social welfare and improving outreach to eligible households and their social networks.

A first set of policy measures aimed at reducing non-take-up addresses issues at the administrative level. For means-tested welfare systems, complexity can be a significant barrier to take-up. Policymakers should balance effective targeting and minimizing non-take-up by simplifying eligibility rules and application procedures. It is well-established that complexity places a significant cognitive burden on individuals[24,25,63]. Simultaneously, financial stress can erode cognitive capacities[5-7]. Therefore, reducing complexity becomes paramount, especially for financially vulnerable individuals whom social welfare aims to assist. Reducing complexity can be achieved in many ways, such as simplifying information letters, streamlining the application process, combining the application procedures for different programs, and decreasing reporting requirements[64–73]. Given the significant adverse effects of reclaims on take-up, policymakers should prioritize preventing overpayments. One way to achieve this could be to simplify or automate the process of reporting changes, thereby reducing the number of reclaims. Digitalization can be essential in simplifying application procedures for eligible households by sharing eligibility findings between different agencies through prepopulated application forms and proactively enrolling eligible households in social welfare programs[56,66,67,74,75].

A second set of policy measures addresses the individual household's level and social networks. Non-take-up can be decreased by an integrated approach encompassing information provision, outreach, and assistance. I found perceived eligibility to be a crucial determinant in benefits take-up, making it imperative to focus on targeted interventions. Efforts could center around personally informing households about their eligibility. Given the importance of network effects, such interventions could encompass informing eligible household's social networks. Trust in government institutions is a pivotal factor influencing welfare participation[72,76,77], emphasizing the need for citizen-centered policies. Particularly for financially vulnerable households, a nuanced understanding of their unique challenges is indispensable in designing tailored interventions.

CONCLUSION

Developing social welfare systems tailored to address the challenges posed by financial scarcity is crucial for safeguarding the well-being of households in vulnerable circumstances. As social welfare adapts to global trends like digitalization and shifting work patterns, policymakers should prioritize simplicity and accessibility. Streamlining administrative processes, simplifying eligibility rules, and harnessing digital tools are vital strategies to enhance the efficacy of welfare systems. At both individual and social levels, targeted outreach and personalized information provision are essential for building trust and encouraging greater take-up.

Greater take-up of social welfare by vulnerable households not only assists them in meeting basic needs and providing for their families but may also enable them to save for unforeseen circumstances and better harness them against overindebtedness due to financial shocks. Improved take-up grants households greater control over their financial circumstances, leading to positive cognitive, emotional, and behavioral outcomes. This, in turn, may help vulnerable households escape financial stress traps, positively impacting their mental and physical health. The enhanced well-being of these individuals contributes to a more resilient and inclusive society.

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Nederlandse samenvatting

Financiële stress door beleid

Een onderzoek naar de oorzaken van niet-gebruik van sociale zekerheid

INLEIDING

Financiële schaarste treedt op als mensen minder geld hebben dan ze nodig hebben[1–4]. Financiële schaarste kan invloed hebben op iemands cognities, emoties en gedrag[5–7]. Deze psychologische gevolgen van financiële schaarste hangen niet alleen af van de financiële situatie op zichzelf, maar worden ook beïnvloed door de perceptie van de situatie. Financiële stress treedt op als mensen geldgebrek en een gebrek aan controle over hun financiële situatie ervaren, piekeren en zich zorgen maken over geldzaken en een kortetermijnfocus hebben[8]. Onderzoek laat een positief verband zien tussen financiële stress en mentale en fysieke gezondheidsproblemen[9–11].

Socialezekerheidsstelsels hebben als doel mensen financieel te ondersteunen die zichzelf (tijdelijk) niet kunnen onderhouden, de negatieve gevolgen van financiële schaarste te verzachten, financiële stress te voorkomen of te verminderen, armoede te verlichten en te voorkomen, de effecten van inkomensschokken te verminderen, bestaanszekerheid te bieden en toegang tot huisvesting, gezondheidszorg en onderwijs mogelijk te maken[12]. Veel huishoudens maken echter geen gebruik van de socialezekerheidsvoorzieningen waarvoor ze in aanmerking komen. Hierdoor slaagt de sociale zekerheid er niet volledig in om financiële zekerheid te bieden aan huishoudens in kwetsbare situaties en financiële stress tegen te gaan. Niet-gebruik van sociale zekerheid kan het mentale welzijn van individuele huishoudens verminderen en armoede en financiële stress in stand houden[13].

Dit proefschrift beoogt een bijdrage te leveren aan het onderzoek naar financiële stress en het niet-gebruik van sociale voorzieningen.

Het eerste deel van dit proefschrift richt zich op financiële stress. Ik onderzocht welke economische factoren samenhangen met veranderingen in financiële stress en hoe veranderingen in financiële stress gerelateerd zijn aan veranderingen in mentale gezondheid (hoofdstuk 2). Vervolgens onderzocht ik de relatie tussen financiële stress en vijf aspecten van de economische situatie van huishoudens: inkomen, spaargeld, schulden, inkomensvolatiliteit en het hebben van werk (hoofdstuk 3).

Het tweede deel van dit proefschrift richt zich op het niet-gebruik van sociale voorzieningen. Op basis van een systematisch review van de literatuur ontwikkelde ik een nieuw conceptueel kader voor niet-gebruik (hoofdstuk 4). Vervolgens

onderzocht ik hoe huishoudens met een laag inkomen sociale zekerheid ervaren (hoofdstuk 5) en analyseerde ik hoe tien psychologische factoren samenhangen met niet-gebruik van zorgtoeslag en kindgebonden budget (hoofdstuk 6). Tenslotte onderzocht ik of er een causaal verband is tussen terugvorderingen en niet-gebruik (hoofdstuk 7).

DEEL I: FINANCIËLE STRESS (HOOFDSTUKKEN 2 EN 3)

Financiële schaarste, het hebben van minder financiële middelen dan nodig[5], komt niet alleen voor in ontwikkelingslanden. Ook in rijke landen leven veel huishoudens in armoede of met problematische schulden, twee ernstige uitingsvormen van financiële schaarste. In de OESO-landen variëren de percentages gezinnen die onder de armoedegrens leven van 5,6% in Tsjechië tot 20,3% in Costa Rica, met percentages tot 15,1% in de Verenigde Staten en 11,2% in het Verenigd Koninkrijk (OESO-gemiddelde 11,5%)[14]. In Nederland, waar de meeste onderzoeken uit dit proefschrift zijn uitgevoerd, leeft 8,3% van de mensen onder de armoedegrens. In de EU heeft 14,1 % van de huishoudens een te hoge schuldenlast en loopt 21 % het risico te veel schulden te hebben[15,g].

Financiële schaarste kan iemand belemmeren om in basisbehoeften te voorzien, zoals voedsel, onderdak en gezondheidszorg, het onderhouden van het gezin, het realiseren van sociale status en zekerheid, het nastreven van doelen en dromen, en het bereiken van persoonlijke voldoening en welzijn. Bovendien kan het hebben van onvoldoende financiële middelen leiden tot financiële stress, wat op zijn beurt een negatieve invloed kan hebben op de mentale en fysieke gezondheid. Om de subjectieve ervaring van financiële stress te meten, ontwikkelden Van Dijk et al.[8] de *Psychological Inventory of Financial Scarcity* (PIFS), een zelfbeoordelingschaal voor iemands financiële situatie en de affectieve en cognitieve reacties hierop. De PIFS combineert de concepten psychologische stress en financiële schaarste. De schaal bestaat uit vier componenten: de perceptie te weinig geld te hebben, een gevoel van gebrek aan controle over geldzaken, zorgen en piekeren over geld en een focus op de korte termijn. De PIFS is gaat uit van het idee dat mensen stress ervaren wanneer ze inschatten dat de eisen van een situatie de beschikbare financiële middelen overstijgen[16,17]. De PIFS is gebaseerd op modellen van algemene stress, waarin stress wordt gezien als een psychologische reactie op een werkelijke of waargenomen dreiging[18–20]. Deze dreiging, en de reactie erop, kunnen leiden tot mentale gezondheidsproblemen, zoals angst en depressie[18].

Stress vernauwt het denk- en handelingsrepertoire van een individu tot specifieke acties om met de dreiging om te gaan[19]. Net als algemene stress kan financiële stress worden gezien als een adaptieve respons op schadelijke of bedreigende situaties. Focussen op de korte termijn is bijvoorbeeld redelijk en noodzakelijk wanneer men te weinig financiële middelen heeft om in basisbehoeften te voorzien (bijvoorbeeld voedsel of onderdak). Onderzoek

laat zien dat mensen zonder financiële middelen beter presteren op selectieve aandacht, waakzaamheid, het detecteren van dreigende gevaren en kansen, het volgen van omstandigheden die snel veranderen, het volharden bij het verkrijgen van een onmiddellijke beloning en het waarderen van geld[20,21].

Hoewel financiële stress kan worden beschouwd als een adaptieve reactie op financiële schaarste, gaat het vaak gepaard met negatieve sociaal-emotionele gevolgen. Zo hangt financiële stress positief samen met eenzaamheid en sociale uitsluiting en negatief met eigenwaarde en affect[8,22,23]. Financiële stress kan ook het cognitief functioneren belemmeren[6] en is negatief gecorreleerd met aandacht, zelfcontrole, planning, probleemoplossend vermogen en het nemen van initiatief[8,23]. Financiële stress lokt ook gedrag uit dat de financiële situatie verder kan verergeren, zoals het vermijden van financiële informatie, het uitstellen van financiële beslissingen, impulsaankopen, gokken, te veel uitgeven, suboptimaal investeren, verminderde effectiviteit bij het zoeken naar werk en te veel lenen[5,24–28]. Door financiële stress kunnen dus cognities, emoties en gedragingen optreden die financiële problemen verder verergeren. Er bestaat met andere woorden een risico op een *financiële-stressfuik*.

Bovendien hangt langdurige financiële stress negatief samen met welzijn en met chronische psychische problemen zoals angst en depressie[9–11,29–31]. Onderzoek naar het verband tussen financiële stress en welzijn is vooralsnog echter voornamelijk cross-sectioneel. Hierdoor is er weinig inzicht in hoe veranderingen in financiële stress samenhangen met veranderingen in welzijn. Mijn eerste studie, beschreven in *hoofdstuk* 2, onderzocht daarom het verband tussen veranderingen in financiële stress en mentale gezondheid tijdens de eerste zes maanden van de COVID-19-pandemie in een longitudinale steekproef van Nederlandse huishoudens (N = 1.114). Deze studie onderzocht ook de relatie tussen verschillende economische factoren, namelijk spaargeld en schulden en (verandering in) inkomen enerzijds, en veranderingen in financiële stress anderzijds. In de studie is gebruik gemaakt van longitudinale data van het LISS-panel, onderdeel van Centerdata.

De studie liet zien dat tijdens de eerste zes maanden van de COVID-19-pandemie de gemiddelde mentale gezondheid stabiel was, maar dat tijdens deze periode de verandering in mentale gezondheid tussen individuen aanzienlijk varieerde. Financiële stress speelde hierbij een cruciale rol: een toename van financiële stress hing samen met een verslechterde mentale gezondheid, terwijl een afname van financiële stress correleerde met een verbeterde mentale gezondheid.

Inkomen bleek hierbij niet de belangrijkste verklarende factor voor veranderingen in financiële stress. Vooral het hebben van minder spaargeld en meer schulden voorafgaand aan de pandemie voorspelden een toename van financiële stress en daarmee een verslechterde mentale gezondheid.

Hoofdstuk 3 ging dieper in op de complexe relatie tussen de economische omstandigheden van huishoudens en financiële stress. Huishoudens met een laag inkomen hebben vaak financiële stress; ze worstelen vaak met rondkomen, wat leidt tot piekeren en verminderde controle[32,33]. Het is echter te simplistisch om alleen op inkomen te focussen bij het voorspellen van financiële stress. . Onderzoek naar sociaaleconomische invloeden op mentale gezondheid heeft verschillende factoren aan het licht gebracht die mentaal welzijn en financiële stress voorspellen. Inkomen is hierin slechts één stukje van de puzzel. Andere economische factoren zoals spaargeld, schulden, inkomensvolatiliteit en het hebben van werk kunnen ook een rol spelen. Studies hebben aangetoond dat spaargeld[34,35] en het hebben van werk[36,37] positief samenhangen met mentaal welzijn, terwijl schulden[38–40] en inkomensvolatiliteit[41,42] in verband worden gebracht met verminderd mentaal welzijn.

De meeste onderzoeken hebben zich tot nu toe gericht op een of twee geïsoleerde aspecten van iemands economische situatie bij het verklaren of voorspellen van financiële stress. De studie uit hoofdstuk 3 neemt een breder perspectief. Ik onderzocht hoe vijf facetten van iemands economische situatie - namelijk inkomen, schulden, spaargeld, inkomensvolatiliteit en het hebben van werk - *in samenhang* financiële stress verklaarden. Dit cross-sectionele onderzoek bracht de relatieve bijdragen van de verschillende economische factoren aan het voorspellen van financiële stress in beeld.

Uit het onderzoek bleek dat inkomen en spaargeld de belangrijkste voorspellers waren van financiële stress. Beide hingen negatief samen met financiële stress. Het aantal schulden speelde een kleinere, maar belangrijke rol; het hebben van meer schulden ging gepaard met meer financiële stress. Het hebben van werk hing negatief samen met financiële stress, maar alleen voor huishoudens met een laag inkomen. De data lieten geen verband zien tussen de hoogte van schulden en inkomensvolatiliteit enerzijds en financiële stress anderzijds.

De bevindingen van de eerste studie wijzen op verschillende mogelijkheden voor verder onderzoek naar de relatie tussen financiële stress en zowel mentale als fysieke gezondheid. Zo zou het nuttig zijn om de relatie tussen mentale gezondheid

en financiële stress over langere perioden te onderzoeken, ook na de COVID-19-pandemie. Ik stel ook voor om de effecten van financiële stress op een breder spectrum van psychische symptomen en stoornissen te onderzoeken, zoals posttraumatische stress, slapeloosheid en eenzaamheid[43–47]. Er bestaat daarnaast uitgebreid onderzoek naar het verband tussen sociaaleconomische status en fysieke gezondheid, waaronder hart- en vaatziekten, artritis, diabetes, chronische aandoeningen van de luchtwegen en baarmoederhalskanker[9,48]. Onderzoek naar de langere termijn effecten van financiële stress tijdens COVID-19 op fysieke aandoeningen op latere tijdstippen kan waardevolle inzichten bieden in het ingewikkelde verband tussen sociaaleconomische status, levensstijl en mentale en fysieke gezondheid.

Bij verder onderzoek naar de voorspellers van financiële stress stel ik voor om de reikwijdte te verbreden door meer, en andersoortige variabelen toe te voegen. Onze studie omvatte vijf economische variabelen – inkomen, spaargeld, schulden, inkomensvolatiliteit en het hebben van werk – en de demografische variabelen leeftijd, geslacht, opleidingsniveau en gezinsgrootte. Andere demografische en psychologische factoren, zoals financiële geletterdheid, zelfeffectiviteit, financiële attitudes en zelfredzaamheid, kunnen in toekomstig onderzoek meegenomen worden. Om de robuustheid van bevindingen te vergroten en causale verbanden vast te stellen, stel ik (quasi)experimenten en longitudinale studies voor naar het verband tussen sociaaleconomische variabelen, financiële stress en mentale gezondheid. Verder stel ik voor om de impact van verschillende soorten schulden op financiële stress en de temporele relatie tussen iemands economische situatie en toekomstige financiële stress te onderzoeken.

DEEL II: NIET-GEBRUIK VAN SOCIALE VOORZIENINGEN (HOOFDSTUKKEN 4 TOT EN MET 7)

Het tweede deel van deze dissertatie gaat in op de cruciale rol die sociale zekerheid speelt bij het verhogen van de financiële veerkracht en bij het voorkomen of verminderen van financiële stress. Sociale voorzieningen bieden financiële zekerheid aan degenen die zichzelf financieel niet kunnen onderhouden. Deze stabiliserende rol van sociale zekerheid is met name cruciaal in het licht van verhoogde macro-economische onzekerheden en volatiele arbeidsmarkten[49]. Het succes van socialezekerheidsstelsels hangt af van hoe gemakkelijk mensen die hulp nodig hebben en er toegang toe hebben[50]. Beleidsmakers worstelen wat dat betreft met een dilemma. Ze ontwerpen criteria om te zorgen dat sociale zekerheid wordt gericht op de huishoudens die ze het meest nodig hebben. Deze criteria kunnen echter hindernissen opwerpen die huishoudens kunnen belemmeren om een beroep te doen op socialezekerheidsvoorzieningen waarop ze recht hebben[51,52].

Hoewel de hoogte van niet-gebruik niet systematisch wordt gemeten, is het wereldwijd een serieus probleem. Hernanz et al. verzamelden beschikbare gegevens in OESO-landen tussen 1974 en 2001[53]. Ze vonden dat niet-gebruik varieerde tussen 20% en 60% voor inkomensafhankelijke regelingen. Bij huursubsidie schommelde het niet-gebruik rond de 20%. Werkloosheidsuitkeringen hadden een niet-gebruik van 20% tot 40%. Ook recente cijfers laten een hoog niet-gebruik zien. Uit een onderzoek uit 2022 in het Verenigd Koninkrijk bleek bijvoorbeeld dat ongeveer 30% van de rechthebbenden geen aanspraak maakte op een pensioentoeslag, terwijl ongeveer 20% geen aanspraak maakte op huurtoeslag voor gepensioneerden[54]. Uit een studie in zes Europese landen bleek dat het niet-gebruik van bijstandsuitkeringen varieerde tussen 38% en 90%[55]. In Nederland is het niet-gebruik rond de 7% voor huurtoeslag, 15% voor kindgebonden budget, 35% voor algemene bijstand en 30% voor de aanvullende inkomensvoorziening ouderen (AIO)[56].

Inzicht in de determinanten van niet-gebruik kan helpen bij het optimaliseren van sociale voorzieningen om de financiële zekerheid van huishoudens te verhogen, waardoor financiële stress wordt voorkomen of verminderd. Een beter begrip van niet-gebruik kan helpen om sociale zekerheid in de toekomst beter vorm te geven.

De literatuur over niet-gebruik kent een lange geschiedenis[57–59] en omvat theoretische en empirische bijdragen uit de economie, psychologie, sociologie en bestuurskunde[60]. In het afgelopen decennium hebben gedragsinzichten

nieuwe factoren aan het licht gebracht die niet-gebruik kunnen verklaren, zoals administratieve rompslomp, slechte ervaringen met sociale voorzieningen en de angst voor terugvorderingen[61,62].

Er bestaan echter nog steeds enkele belangrijke lacunes in het onderzoek naar niet-gebruik. Ten eerste is de grote hoeveelheid literatuur die in de afgelopen tien jaar is toegevoegd, niet systematisch beschreven. Het zeer invloedrijke model dat Van Oorschot in de jaren negentig ontwikkelde[52] geldt nog steeds als leidraad voor veel van de studies over niet-gebruik. Zowel onderzoek als beleid zouden zijn gebaat bij een geactualiseerd model voor niet-gebruik.

Hoofdstuk 4 beschrijft daarom een systematische literatuurstudie naar de determinanten van niet-gebruik. Op basis van de PRISMA-extensie voor scoping reviews[63] heb ik de literatuur over niet-gebruik tussen 2012 en 2023 geanalyseerd. Op basis van de uitkomsten van onze analyses heb ik een nieuw theoretisch kader ontwikkeld dat richting kan geven aan toekomstig onderzoek, beleid en praktijk. Dit theoretisch kader voor niet-gebruik omvat vier niveaus, die voortkomen uit de literatuur: (1) de samenleving, (2) beleid en uitvoering, (3) de sociale omgeving en (4) het huishouden.

Er zijn theoretische argumenten waarom factoren op het niveau van de samenleving, zoals welvaartsniveau en juridische context, niet-gebruik zouden kunnen beïnvloeden. Ik vond hiervoor echter weinig empirisch bewijs, mede omdat er nog weinig onderzoek beschikbaar is. Een belangrijke factor op het niveau van beleid en uitvoering is de complexiteit van regels en procedures. Informatieverstrekking over het recht op sociale zekerheid vermindert niet-gebruik, terwijl andere gedragsinterventies een beperkt effect laten zien. Sociale netwerken zijn van invloed op niet-gebruik. Als voorgestelde mechanismen werden onder meer informatieverspreiding[64,65], steun[64,66] en sociale normen[67,68] genoemd, maar het bewijs is gemengd en meestal indirect. Op het niveau van het huishouden is er sterk bewijs dat administratieve rompslomp[61,69,70], algemene vaardigheden[24,70,71], specifieke demografische variabelen (bijvoorbeeld migratie-achtergrond[72,73]) en kennis over regelingen[74–76] een rol spelen bij niet-gebruik. Stigma wordt veel genoemd als mogelijke oorzaak voor niet-gebruik, maar het bewijs is niet eenduidig[76–78].

Een tweede lacune in de literatuur over het niet-gebruik van sociale voorzieningen die ik opmerkte is dat deze voornamelijk bestaat uit theoretisch en kwantitatief onderzoek. Er blijken maar weinig kwalitatieve studies te zijn gedaan naar

hoe huishoudens in financieel kwetsbare situaties sociale zekerheid ervaren. Kwalitatieve studies zijn cruciaal om goed zicht te krijgen op de ervaringen en context van huishoudens in kwetsbare situaties in relatie tot sociale zekerheid. Inzicht in deze ervaringen en context kan helpen bij het ontwikkelen van socialezekerheidsstelsels die beter aansluiten bij de behoeften van deze huishoudens.

Hoofdstuk 5 onderzocht daarom hoe huishoudens de sociale zekerheid in Nederland ervaren. We interviewden op straat op de Haagse Markt en in het centrum van Eindhoven mensen die moeite hadden met rondkomen. In semigestructureerde interviews vroegen we 31 mensen naar hun ervaringen met geld en sociale voorzieningen.

Financiële stress kwam veel voor bij de deelnemers aan de interviews. Angst voor terugvorderingen van toeslagen en wantrouwen in overheidsinstellingen waren de belangrijkste belemmeringen voor het gebruik van sociale voorzieningen. Deze angst en dit wantrouwen waren veelal gebaseerd op eigen negatieve ervaringen met de overheid. Het Toeslagenschandaal speelde een beperkte rol. Schaamte en stigmatisering speelden een rol bij het aanvragen van lokale regelingen, maar niet bij toeslagen. Formele en informele ondersteuning stimuleerden het gebruik van regelingen, maar een belangrijk deel van de geïnterviewden had geen toegang tot dergelijke ondersteuning.

Een derde lacune in het onderzoek naar niet-gebruik is dat het empirisch onderzoek versnipperd is. In de afgelopen tien tot vijftien jaar hebben studies uit verschillende vakgebieden gedragsinzichten toegepast in het onderzoek naar niet-gebruik. Deze omvatten echter doorgaans slechts een select aantal potentiële factoren die niet-gebruik kunnen verklaren, die niet waren geïntegreerd in een theoretisch model.

Om deze lacune te vullen combineerde ik in *Hoofdstuk 6* theoretische en empirische bevindingen ten aanzien van niet-gebruik uit de economie, bestuurskunde en psychologie in één kwantitatief model, gebaseerd op het COM-B-model, dat in gedragsonderzoek veel wordt gebruikt[79]. De studie onderzocht hoe verschillende psychologische factoren het niet-gebruik van zorgtoeslag en kindgebonden budget verklaarden. Daardoor kon ik uitspraken doen over de relatieve bijdrage van deze verschillende factoren aan niet-gebruik. Voor het onderzoek vulden 905 deelnemers aan het LISS-panel die recht hadden op zorgtoeslag of kindgebonden budget een vragenlijst in. Het gepercipieerde recht bleek de belangrijkste

verklarende factor voor niet-gebruik. Een andere belangrijke factor was de ervaren noodzaak voor het gebruik van de toeslagen. Uit explorerende analyses bleek dat executieve functies, zelfredzaamheid, angst voor terugvorderingen, financiële stress en stigma mogelijk een kleine, indirecte rol spelen bij niet-gebruik. De resultaten lieten geen verbanden zien tussen kennis over de toeslagen, sociale steun en administratieve lasten enerzijds en niet-gebruik anderzijds.

Een vierde lacune in het onderzoek naar niet-gebruik is dat er nog weinig onderzoek is gedaan naar de mogelijke effecten van terugvorderingen op niet-gebruik. Terugvorderingen zijn de laatste jaren bijzonder relevant geworden. Door veranderende werkgever-werknemerverhoudingen en andere macro-economische trends hebben steeds meer burgers een variabel inkomen. Beleidsmakers hebben geprobeerd beleid te ontwikkelen dat zorgt voor een betere en snellere afstemming op de dynamische financiële situatie van huishoudens. Millar en Whiteford[80] merken op dat deze verhoogde responsiviteit het risico met zich meebrengt dat uitkeringen uit de pas gaan lopen met omstandigheden. Dit kan ertoe leiden dat te hoge bedragen worden uitbetaald, hetgeen terugvorderingen tot gevolg kan hebben[80]. In de context van toeslagen in Nederland zijn terugvorderingen extra relevant vanwege de voorschotsystematiek. In 2016 werd ongeveer € 1,0 miljard teruggevorderd (ofwel 8% van de uitgaven). Op een totaal van 8 miljoen toekenningen waren er 2,3 miljoen terugvorderingen[81]. Er is weinig bekend over de invloed van terugvorderingen van sociale voorzieningen op niet-gebruik.

Hoofdstuk 7 beschrijft twee experimentele studies die hier meer zicht op poogden te verkrijgen. Met behulp van een experimenteel paradigma onderzocht ik of terugvorderingen niet-gebruik verhoogde. Deelnemers uit het Verenigd Koninkrijk (totaal N = 472) voerden een taak uit waarin de financiën van een huishouden werden gesimuleerd: deelnemers deden werk, ontvingen salaris en een inkomenstoeslag en moesten uitgaven doen. Een deel van de deelnemers werd hierbij geconfronteerd met een terugvordering, een ander deel niet. De resultaten van beide experimenten lieten zien dat terugvorderingen leidden tot niet-gebruik van de inkomenstoeslag, en dat dit niet verklaard kon worden door een vergelijkbare plotselinge aanslag op het inkomen. Ik vond bovendien aanwijzingen dat het hebben van een schuld het effect van een terugvordering op niet-gebruik versterkte.

IMPLICATIES VOOR SOCIAAL BELEID

Actuele uitdagingen voor sociale zekerheid

Een stelsel van sociale zekerheid kan inkomenszekerheid bieden aan kwetsbare huishoudens en kan zo bijdragen aan het voorkomen van financiële stress en het verminderen van armoede. De effectiviteit van sociale zekerheid bij het verminderen van armoede en financiële stress hangt af van de toegankelijkheid ervan voor degenen die het nodig hebben[50]. Veel huishoudens maken geen gebruik van de voorzieningen waarvoor ze in aanmerking komen. Het gebruik van sociale voorzieningen staat onder druk als gevolg van twee trends: (1) een toenemende nadruk op activering in plaats van inkomensondersteuning en (2) toenemende digitalisering.

Wereldwijd is de prioriteit in sociaal beleid verschoven van inkomensondersteuning naar activering van de beroepsbevolking en economische efficiëntie[82–85]. Deze verschuiving heeft geleid tot strengere criteria om in aanmerking te komen voor sociale zekerheid[84,86–91], met veel aandacht voor de arbeidseis[85,92,93]. Deze nadruk op activeringsbeleid en economische efficiëntie sluit aan bij de bredere trend van bezuinigingen op de verzorgingsstaat sinds de jaren tachtig[83]. Uit de literatuur blijkt dat er tot het begin van de tachtiger jaren van de vorige eeuw een stijging was van het aantal uitkeringen aan de beroepsbevolking in West-Europa, gevolgd door consolidatie[53,94]. Sindsdien hebben bezuinigingen de boventoon gevoerd, wat heeft geleid tot strengere toelatingsregels[84]. Deze strengere regels verhoogden weliswaar de economische efficiëntie en de activering van de beroepsbevolking, maar leidden onbedoeld tot meer niet-gebruik[86]. Strengere criteria gaan veelal gepaard met complexere regels en procedures. Zoals we eerder zagen is er een sterke samenhang tussen complexiteit van regels en procedures enerzijds en niet-gebruik anderzijds. Mogelijke verklaringen zijn dat huishoudens afzien van het aanvragen van voorzieningen vanwege de administratieve rompslomp die het oplevert, omdat ze de vaardigheden missen die nodig zijn om voorzieningen aan te vragen of vanwege de angst voor terugvorderingen die gepaard kunnen gaan met strenge criteria.

Ten tweede transformeert digitalisering de verzorgingsstaat. Automatisering zorgt voor stroomlijning van processen[95,96] en vergroot de behoefte aan internettoegang en digitale vaardigheden[97]. De verschuiving van verantwoordelijkheden van de overheid naar individuen door middel van *self service* kan huishoudens die al belast zijn met verschillende taken overbelasten, wat kan leiden tot niet-gebruik[98–100]. Ook zijn geautomatiseerde systemen vaak rigide en houden ze geen rekening

met situaties zoals die zich in het echte leven kunnen voordoen[97]. Onderzoekers hebben betoogd dat digitalisering van de sociale zekerheid bestaande patronen van ongelijkheid kan versterken, omdat digitale uitsluiting samenhangt met sociaaleconomische status. Zij geven aan dat digitalisering van de sociale zekerheid nieuwe ongelijkheden tussen sociale groepen kan veroorzaken omdat een substantieel deel van de bevolking vanwege beperkte digitale vaardigheden moeite heeft om mee te komen in het digitale tijdperk[96,99,101].

Deze twee trends kunnen leiden tot een toename van niet-gebruik, waardoor twee doelstellingen van de sociale zekerheid in gevaar komen: het verminderen van armoede en het verminderen van financiële stress. Dit kan met name gevolgen hebben voor groepen in kwetsbare situaties, zoals laagopgeleiden, werklozen en migranten[92,93].

Toekomstige hervormingen van de sociale zekerheid
Sociale zekerheid speelt een belangrijke stabiliserende rol voor individuen en samenlevingen. De uitgebreide steunpakketten die regeringen hebben ingevoerd tijdens COVID-19 hebben dit bevestigd.

De structurele transformaties als gevolg van de digitalisering en de veranderende aard van werk hebben ingrijpende gevolgen voor de socialezekerheidsstelsels[50,102,103]. Met minder stabiele loopbaanpatronen en de opkomst van nieuwe vormen van werk kunnen traditionele modellen van sociale zekerheid die gekoppeld zijn aan een stabiele, langdurige baan minder effectief worden. In de platformeconomie, gekenmerkt door flexibele banen met veel freelancers op project- of taakbasis, ontbreken vaak sociale voorzieningen, zoals ziektekostenverzekering, pensioenregelingen en werkloosheidsuitkeringen, die vaak worden geassocieerd met traditioneel voltijds werk.

Er is een groeiende behoefte om het socialezekerheidsbeleid aan te passen aan het veranderende arbeidslandschap. Beleidsmakers zoeken innovatieve oplossingen om ervoor te zorgen dat personen die niet-traditioneel werk verrichten, toegang hebben tot adequate sociale vangnetten.

De veranderende aard van werk maakt het noodzakelijk om socialezekerheidsstelsels grondig te evalueren en aan te passen om ervoor te zorgen dat ze individuen effectief ondersteunen in een omgeving die wordt gekenmerkt door digitalisering, flexibele werkregelingen en dynamische loopbaanpatronen.

Om te garanderen dat sociale zekerheid haar stabiliserende rol kan vervullen, zouden overheden er goed aan doen prioriteit te geven aan het waarborgen van de financiële zekerheid van huishoudens in kwetsbare omstandigheden. De trends die hierboven zijn genoemd, wijzen in tegengestelde richting: bezuinigingen en digitalisering krijgen prioriteit op de beleidsagenda, wat het risico op het niet-gebruik van regelingen vergroot. Het stellen van prioriteiten is uiteindelijk een politieke beslissing, maar beleidsmakers moeten zich bewust zijn van mogelijke (onbedoelde) gevolgen. Dergelijke beleidskeuzes kunnen namelijk de financiële veerkracht van burgers in kwetsbare situaties ondermijnen, met negatieve effecten op hun mentale en fysieke welzijn. Dit kan leiden tot aanzienlijke maatschappelijke kosten.

Onze studies bieden inzichten die kunnen helpen bij het ontwerpen van effectievere socialezekerheidsstelsels. Ik belicht een paar belangrijke inzichten en plaats die in de Nederlandse context.

Complexiteit verminderen. Het streven om regelingen alleen te laten gelden voor mensen die ze het meest nodig hebben leidt tot complexe regels en aanvraagprocedures. Complexiteit van regelgeving vormt een aanzienlijke cognitieve belasting voor mensen[62,104,105]. Tegelijkertijd kan financiële stress cognitieve capaciteiten verminderen. Om die reden hebben juist mensen in een financieel kwetsbare situatie het meeste last van deze complexiteit. Dus paradoxaal genoeg leiden regels die tot doel hebben om voorzieningen terecht te laten komen bij degenen die ze het meest nodig hebben juist bij deze groep eerder tot niet-gebruik. Het verminderen van complexiteit zou dan ook prioriteit moeten krijgen. Het verminderen van complexiteit kan op veel verschillende manieren, zoals het vereenvoudigen van informatiebrieven, het stroomlijnen van het aanvraagproces, het combineren van de aanvraagprocedures voor verschillende programma's en het verminderen van rapportagevereisten[61,72,76,106–112].

Terugvorderingen terugdringen. De specifieke Nederlandse voorschotsystematiek leidt tot miljoenen terugvorderingen per jaar. Ons onderzoek liet zien dat terugvorderingen niet-gebruik tot gevolg kunnen hebben. Daarnaast lijken terugvorderingen het wantrouwen in de overheid te vergroten. Beleidsmakers zouden dan ook prioriteit moeten geven aan het voorkómen van terugvorderingen. Dit kan bijvoorbeeld door ervoor te zorgen dat wijzigingen eenvoudig zijn door te geven aan de Dienst Toeslagen en dat veel voorkomende wijzigingen, zoals inkomenswijzigingen of wijzigingen in de gezinssamenstelling, automatisch worden doorgegeven. Een andere manier om terugvorderingen terug te dringen is het afschaffen van de voorschotsystematiek door het recht op toeslagen te baseren op het inkomen van afgelopen jaar.

Integrale ondersteuning. Mijn onderzoek liet zien dat gepercipieerd recht een cruciale bepalende factor is voor het niet-gebruik van sociale voorzieningen. Het persoonlijk informeren van huishoudens die in aanmerking komen voor voorzieningen is een kansrijke manier om niet-gebruik tegen te gaan. Daarbij is het essentieel om persoonlijke hulp te bieden aan hen die het om wat voor reden dan ook niet lukt om de voorzieningen zelf aan te vragen. Vertrouwen in overheidsinstellingen is een cruciale factor die van invloed is op sociale zekerheid[61,113,114]. Daarom is het essentieel om sociaal beleid te maken waarin de burger centraal staat. Met name voor huishoudens in kwetsbare situaties is een genuanceerd begrip van hun unieke uitdagingen onmisbaar bij het ontwerpen van interventies op maat.

CONCLUSIE

Sociale voorzieningen hebben tot doel om huishoudens in financieel kwetsbare omstandigheden te ondersteunen. Bij het ontwerp van socialezekerheidsvoorzieningen wordt echter te weinig rekening gehouden met de omstandigheden van de huishoudens voor wie ze bij uitstek bedoeld zijn. Dit zorgt ervoor dat een deel van deze huishoudens geen gebruik maakt van deze voorzieningen. Deze huishoudens blijven daardoor financiële stress ervaren, en dit heeft negatieve consequenties voor hun welzijn en gezondheid.

Socialezekerheidsvoorzieningen moeten zich aanpassen aan wereldwijde trends als digitalisering en flexibilisering van arbeid. Beleidsmakers zouden daarbij prioriteit moeten geven aan het terugdringen van niet-gebruik, vooral onder huishoudens in financieel kwetsbare omstandigheden. Het vereenvoudigen van regels, het voorkomen van terugvorderingen en het bieden van integrale en persoonlijke hulp zijn essentiële ingrediënten van een aanpak om niet-gebruik, en daarmee financiële stress, terug te dringen en het vertrouwen van burgers in de overheid te vergroten.

Als huishoudens in kwetsbare omstandigheden meer gebruik maken van sociale voorzieningen, helpt dit hen niet alleen om in hun basisbehoeften te voorzien en voor hun gezin te zorgen, maar kan het hen ook in staat stellen te sparen voor onvoorziene omstandigheden en zich beter te wapenen tegen schulden als gevolg van financiële schokken.

Als sociale voorzieningen huishoudens beter bereiken, geeft hen dit meer controle over hun financiële omstandigheden, wat leidt tot positieve cognitieve, emotionele en gedragsresultaten. Dit kan huishoudens helpen om de *financiële-stressfuik* te doorbreken, wat een positieve invloed heeft op hun mentale en fysieke gezondheid. Dit draagt bij aan een veerkrachtigere en inclusievere samenleving.

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Nawoord

NAWOORD

"Some things are up to us, while others are not. Up to us are opinion, motivation, desire, and, in a word, whatever is of our own doing; not up to us are our body, our property, reputation, and, in a word, whatever is not our own doing." (Epictetus, Encheiridion 1.1).

De reis die eindigde met deze dissertatie begon in het voorjaar van 2019, maar de oorsprong ervan gaat ongeveer vijftien jaar terug, toen ik betrokken raakte bij de oprichting van het platform Wijzer in geldzaken bij het Ministerie van Financiën. Dit platform beoogt de financiële vaardigheden en weerbaarheid van mensen te vergroten. Ondanks mijn geloof in het belang van financiële educatie, besefte ik al snel dat educatie alleen niet voldoende was en dat gedrag van mensen voor een belangrijk deel wordt bepaald door de context waarin het zich afspeelt. In deze periode werd het toepassen van gedragsinzichten steeds populairder onder beleidsmakers in het financiële domein.

Tijdens mijn studie econometrie was ik voornamelijk bezig met statistische modellen, maar ik was altijd al gefascineerd door menselijk gedrag. Dit stimuleerde mij om mij te verdiepen in de psychologie en lessen hieruit te integreren in mijn werk bij Wijzer in geldzaken. Al snel ontdekte ik dat er een aanzienlijke kloof bestond tussen wetenschappelijk onderzoek naar gedragsinzichten en de praktijk van beleidsmakers.

In de daaropvolgende jaren heb ik geprobeerd om een brug te slaan tussen academisch onderzoek en praktijk in financiële educatie. Gedurende deze tijd ontmoette ik Wilco, wiens opmerking in het voorjaar van 2019, "wordt het niet eens tijd dat je gaat promoveren?", het startpunt markeerde van mijn promotietraject. Na een jaar van voorbereiding in het Dual PhD Program begon ik in september 2020 als buitenpromovendus.

Ik ben de vele mensen die een rol hebben gespeeld in deze reis ontzettend dankbaar. Het is onmogelijk is om iedereen te noemen, maar een paar mensen wil ik in het bijzonder bedanken.

Hilde heeft me vanaf het allereerste begin van deze reis onvoorwaardelijk gesteund. Haar steun was van onschatbare waarde, niet alleen omdat ze in mij geloofde toen ik aan mezelf twijfelde, maar ook omdat ze geduldig was terwijl ik soms afwezig was, wanneer ik eigenlijk aanwezig had moeten zijn.

Wilco was een geweldige promotor. Zijn continue steun en scherpe feedback waren van onschatbare waarde gedurende het hele proces. Ons gedeelde gevoel voor humor maakte de reis des te plezieriger.

Mark was aanwezig toen Wilco zijn terloopse opmerking maakte. Hij heeft me geholpen om van een vaag idee een concreet onderzoeksvoorstel te maken. Tot vervelens toe vroeg hij: “Wat is je onderzoeksvraag?”. En als ik dan begon te praten, zei hij: “Dat is te lang”. Zijn begeleiding in het eerste jaar dwong me om mijn gedachten scherp en gefocust te houden.

Eric en Lotte, mijn tweede promotor en copromotor, waren altijd bereid om hun scherpe inzichten te delen, al leidde dit soms tot milde wanhoop. Hun toewijding aan het verbeteren van de kwaliteit van onze studies was inspirerend en hielp me om mijn werk naar een hoger niveau te tillen. Ze hadden een duidelijke visie op waar de onderzoeken heen moesten, en waren tegelijkertijd zeer scherp op de details.

Minou, Tamara en Leon dienden als inspirerende voorbeelden voor mijn promotie-avontuur, waarschijnlijk zonder het te beseffen. Hun ervaringen en waardevolle adviezen hielpen me valkuilen te vermijden en nieuwe wegen te verkennen in mijn onderzoek. Leons bijdrage aan de experimentele studie in hoofdstuk 7 was daarnaast van onschatbare waarde.

Rick, Dörthe, Bart en Sander waren onmisbaar bij het opzetten en uitvoeren van de kwalitatieve studie van hoofdstuk 5. Ik bewaar zeer dierbare herinneringen aan de gesprekken met huishoudens in financieel kwetsbare situaties die we samen in Den Haag en Eindhoven hielden. Deze zijn richtinggevend geweest voor dit proefschrift.

Gabry’s methodologische begeleiding bij het opzetten van een kwalitatieve studie was uiterst waardevol. Haar onverwachte overlijden was een enorme schok. Hoofdstuk 5 is dan ook opgedragen aan haar nagedachtenis als een eerbetoon aan haar bijdrage.

Marikes doortastende analyses hielpen enorm bij het verfijnen van het voorstel en de analyses voor hoofdstuk 6. Haar vermogen om zowel scherp als vriendelijk te zijn is voor mij heel inspirerend en leerzaam.

Marret is het schoolvoorbeeld van iemand met een zeer hoog academisch en ethisch niveau, een berg energie en een enorm gevoel voor humor. Dit alles heeft enorm geholpen bij de totstandkoming van het experiment beschreven in hoofdstuk 7.

Linda en Jens waren moedig genoeg om met mij het avontuur aan te gaan van de literatuurstudie, zonder te weten waar deze reis ons naartoe zou brengen. Hun vastberadenheid en doorzettingsvermogen tijdens deze avontuurlijke reis resulteerden uiteindelijk in hoofdstuk 4 van deze dissertatie.

Dit promotietraject was niet alleen een academische reis, maar ook een persoonlijke ontdekkingstocht. Ik herontdekte het Stoïcisme, dat me opnieuw leerde om tegenslagen te verwerken en me te concentreren op wat ik kon beïnvloeden, namelijk mijn gedachten en acties.

Curriculum vitae

CURRICULUM VITAE

Olaf Simonse werd geboren op 10 maart 1970 in Ede. Hij behaalde zijn Gymnasium-β-diploma aan het Norbertuscollege in Roosendaal in 1988. Na het vervullen van zijn militaire dienstplicht begon hij aan een studie econometrie in Tilburg, waar hij in 1994 afstudeerde.

Na zijn studie trad hij als trainee in dienst bij IBM Nederland. Tussen 1995 en 2007 bekleedde hij verschillende functies binnen het bedrijf, waaronder businessanalist, teamleider en programmamanager. In 2007 maakte hij de overstap naar het ministerie van Financiën, waar hij leiding gaf aan het platform Wijzer in geldzaken.

In 2019 begon Olaf als buitenpromovendus bij de sectie Sociale, Economische en Organisatiepsychologie van de Universiteit Leiden. Tijdens zijn promotietraject maakte hij in 2022 binnen het ministerie de overstap van Financiën naar het directoraat-generaal Herstel Toeslagen. In 2023 trad hij in deeltijd in dienst als onderzoeker en adviseur bij het Kenniscentrum Psychologie en Economisch Gedrag, verbonden aan de sectie Sociale, Economische en Organisatiepsychologie van de Universiteit Leiden. In datzelfde jaar werkte hij ook bij Brightlands Smart Services Campus in Heerlen als programmamanager van het ELSA Lab Armoede en Schulden. Sinds december 2023 werkt Olaf fulltime voor het Kenniscentrum Psychologie en Economisch Gedrag.