RON VAN SCHIE

Planning for retirement: Save more or retire later?

Planning for Retirement: Save More or Retire Later?

Planning for Retirement: Save More or Retire Later?

Plannen voor het pensioen: Meer sparen of later met pensioen gaan?

Thesis

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Ron van Schie
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Chapter 1

Introduction

Over recent decades, the global pension landscape has changed. In many developed countries, there has been a gradual shift from defined benefit retirement plans to defined contribution retirement plans. As a consequence, individuals now face a wide range of retirement decisions, such as when to save and how much to contribute to their pension plans. In countries where defined benefit plans remain predominant, recent years have also taught us that individuals should actively consider their retirement situations and cannot simply assume that their retirement savings will be sufficient. In the Netherlands, for example, defined pension payoffs have become less generous in the last decade and the number of pension funds that needed to cut indexation or nominal pension rights recently has increased (Goudswaard, 2014). As a result, guaranteed pension incomes after retirement have come under pressure and individuals are increasingly asked to take a more active role in planning for a financially secure retirement.

Nowadays, it is well known that many individuals are not very eager to plan for their retirement. In particular, individuals typically do not tend to think about their future retirement situations (Lusardi & Mitchell, 2007a), and once they do, they are reluctant to change their planning and savings behavior accordingly (Thaler & Benartzi, 2004). As a consequence, many individuals are considered at risk of preparing inadequately. According to the Retirement Confidence Survey, for example, more than 40 percent of American workers are not confident that they will have enough money to live comfortably throughout their retirement (Helman, 2015). Similarly, in the Netherlands, more than 25 percent of Dutch workers are worried they are not saving enough to maintain their standard of living in retirement (Wijzer in Geldzaken, 2014). Hence, there is a clear need for many individuals to take more active control of their retirement planning.

Planning for retirement involves different decisions. When individuals plan for a financially comfortable retirement, they can utilize several strategies to adjust their level of retirement income. One of the most prominent strategies for individuals to follow is to adjust how much they contribute to their employer pension plan or individual retirement accounts. On the other hand, they might also adjust their planned retirement age. This seems an increasingly interesting strategy given that recent changes in many pension systems make later retirement financially more rewarding. The question what drives

individuals to consider additional savings or to change their planned retirement age is addressed in this thesis.

1.1 Motivation

Increasingly, individual workers are asked to take a share of responsibility in planning for their retirement. Given that many individuals act passively and often tend to postpone retirement decisions, policymakers and companies are challenged to encourage individuals to increase their consideration of these decisions. Numerous efforts have been made to help individuals prepare for retirement, such as offering educational programs (e.g. Lusardi & Mitchell, 2007b) and the use of persuasive communication strategies (e.g. Wiener & Doescher, 2008). Yet, for these efforts to be effective, a clear understanding is needed of individuals' motivations to consider retirement decisions. What drives individuals to consider an increase in their savings rate? What motivates them to adjust their planned retirement age? To date, these questions remain largely unanswered because of a lack of scholarly research that addresses the processes (especially the psychological ones) underlying individuals' tendencies to plan for retirement (e.g. Croy, Gerrans, & Speelman, 2010a; Hershey, Jacobs-Lawson, McArdle, & Hamagami, 2007).

1.2 Retirement planning

Once individuals fully retire, they will no longer receive income from employment. Instead, they will be mainly dependent on income generated from their pensions and personal savings. Individuals should therefore carefully consider whether their accumulated savings will probably be sufficient for a comfortable retirement and adjust their planning behavior if needed. In this thesis, we focus on two prominent strategies that individuals can utilize when it comes to planning for an adequate retirement: save more or retire later.

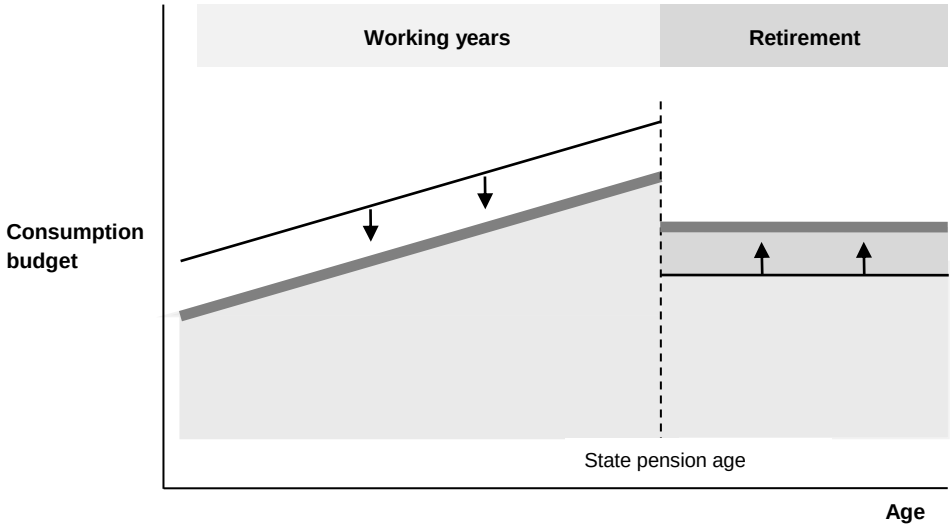
The first planning strategy that individuals can use is to decide how much money they set aside for retirement. For individuals in most developed countries, retirement income consists of a combination of state pension (e.g. social security), occupational pensions (i.e. employer pensions) and private savings. Changing demographics and difficult times for participants in financial markets have put collective pension plans under pressure in many developed countries (Bodie & Prast, 2012; AFM, 2015). As a consequence, projected retirement incomes are decreasing and individuals' voluntary saving decisions have become more important in order to reach an adequate level of

retirement resources. When it comes to increasing personal savings contributions, individuals need to trade-off current consumption versus future consumption. Simply put, saving extra for retirement requires an individual to give up a portion of consumption today in exchange for more consumption in the future after retirement. This is shown in Figure 1.1 (option 1). One can save extra, for example, by increasing contributions to an employer savings plan or a personal pension account.

An alternative solution that individuals can use to adjust the adequacy of their retirement income is to adjust their (planned) retirement age. After years of advancing early retirement schemes, in recent decades policymakers have been looking at persuading individuals to work longer and retire later. Pension systems in many developed countries have been adjusted so that, if individuals retire at younger ages, their pensions will be reduced accordingly. In the Netherlands, for example, the government has taken measures to decrease the financial attractiveness of early retirement and reward individuals for postponing retirement (Euwals, Van Vuuren, & Wolthoff, 2010). In addition, the age at which someone is eligible for the state pension will gradually increase to 67 by 2021 (The Actuary, 2014). Similar reforms have been made in other European countries and hence average retirement ages across Europe are rising (Statistics Netherlands, 2016). In the Netherlands, retiring before the official state pension age has become less attractive for several reasons. One reason is that individuals must independently finance the period up to the age when they are eligible for the state pension, and benefits from employer pensions will be substantially lower if they are paid from a younger age. Delaying retirement, on the other hand, generally results in higher pension payments during retirement because individuals contribute to their pensions for more years and receive benefits for fewer years. Instead of giving up a portion of consumption today, which is the case when someone decides to save more, this alternative requires the individual to give up a portion of leisure time and work longer in the future in exchange for a higher level of consumption after retirement. The consequence of delaying retirement age is shown in Figure 1.1 (option 2).

Figure 1.1: Saving more vs. retiring later

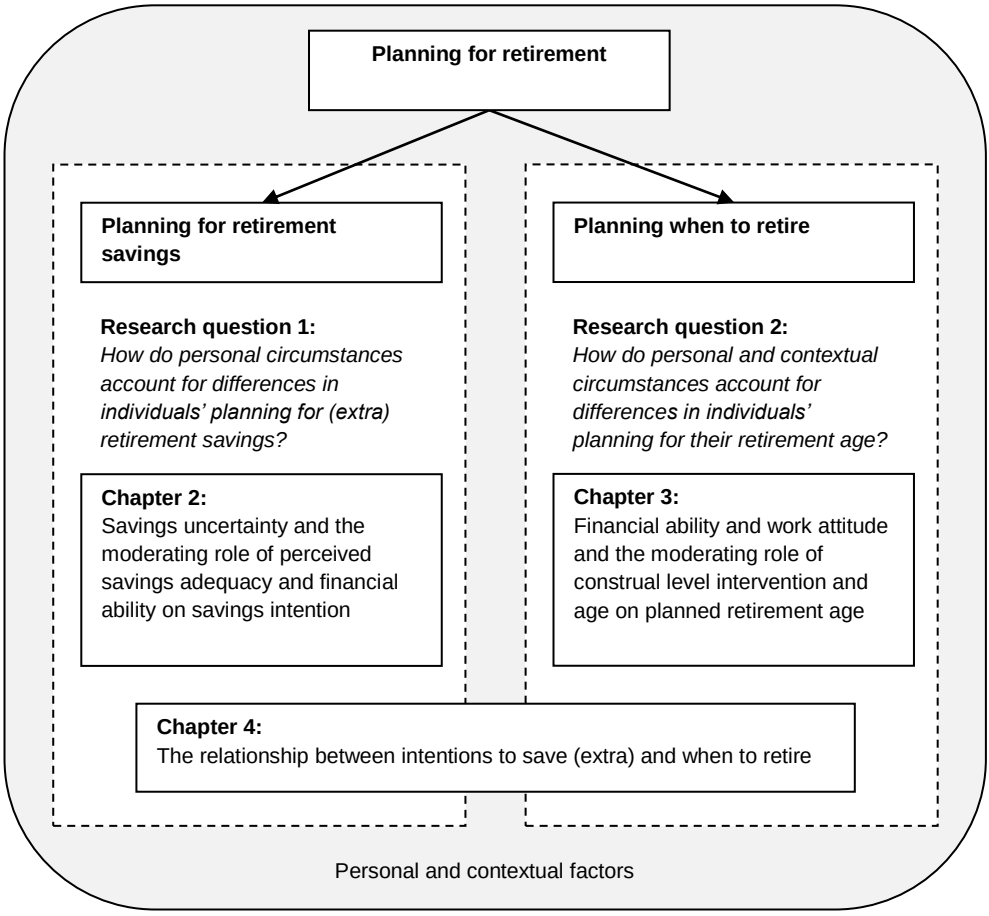
Option 1: Increase savings for retirement



Option 2: Retire later

In chapters two to four of this dissertation we combine insights from literature in economics and psychology to study the processes that drive individuals to consider the aforementioned strategies in their retirement planning process, that is, the decision to start saving (more) and the decision when to retire (see Figure 1.2). Planning for a comfortable retirement is a complex process that involves a trade-off among benefits and costs in the future and the present. The aim of this dissertation is not to study an exhaustive list of all factors that affect retirement planning, but to focus on several influential factors in particular, that either play a role for the individual in the more distant future around retirement (i.e. perceived pension savings adequacy, uncertainty and expected work attitude), or a role in the present (i.e. financial ability, age and the context) of the decision.

Figure 1.2: Thesis structure



1.3 Dissertation outline

In chapter 2, we study the effect of uncertainty regarding one's retirement savings adequacy on intentions to start additional savings and search for retirement information. When individuals try to determine whether their current savings contributions are sufficient to support a comfortable pension, there are many uncertainties they need to consider. Although we expect that individuals at least have some notion of the adequacy of their current savings, we propose that their feeling of uncertainty surrounding this expectation is also likely to influence their intention to consider extra savings. From previous research, there is no clear prediction of the effect of uncertainty on the decision to start saving more, as literature in economics on precautionary saving (e.g. Carroll & Kimball, 2008) and literature in psychology on choice deferral (e.g. Tversky & Shafir, 1992) show opposing predictions. In chapter 2, we develop a conceptual framework to study the circumstances under which uncertainty drives or hinders individuals as regards starting to save more. We propose that the effect of uncertainty depends on an individual's perception of the adequacy of current savings and on that individual's financial ability to increase contributions.

In chapter 3, we consider individuals' planned retirement age and study the influence of intervention-induced mindsets (i.e. contextually driven global vs. local mindsets) vs. the chronic representation (in terms of which goal is primary to the decision) of different age groups on the decision to delay planned retirement. This is of particular interest, as policymakers in many industrialized countries have taken measures to increase the eligible state pension age and to make early retirement less attractive. When individuals plan for retirement, they need to balance having to save to financially support themselves during retirement (a *feasibility* oriented consideration) and how strong their preference is for retiring earlier (a *desirability* oriented consideration). While recent reforms have made it financially harder to retire early, at the same time it is well known that individuals' willingness to work longer is generally low. This clearly highlights the tradeoff individuals need to make between feasibility and desirability oriented considerations. Until now, little has been known about the relative importance of these two conflicting aspects when individuals plan for retirement. Building on construal level theory (Trope & Liberman, 2003, 2010) and age-dependent differences in goal orientation (e.g. Freund & Ebner, 2005; Rhodes, 1983), we aim to increase our understanding of the role that feasibility and desirability oriented considerations play in the planning process of different age groups, and how construal level interventions affect the relative impact of each of these considerations. We predict an age-related reversal of the effect of a construal

level intervention, due to a shift in the considerations by which younger and older individuals are primarily driven.

In chapter 4, we examine the interrelation between intentions to save more and considerations about when to retire. When individuals do not save enough to support a comfortable retirement, they can follow two main strategies to overcome this gap: save more or retire later. Most previous research has investigated individuals' intentions to use one of these strategies in isolation, which we also did in chapters 2 and 3. In this study, we examine how the intentions of individuals to follow each strategy may be interrelated. We argue that lower perceived savings adequacy increases individuals' intentions to save more, but if current financial ability to increase savings is low and hence there are barriers to adjusting savings, individuals may adjust their planned retirement age and intend to retire later instead.

In summary, the overall goal of this dissertation is to study the (psychological) processes underlying individuals' tendencies to consider adjustments in their retirement planning with regard to saving (more) and with regard to when to retire. An overview of the different chapters, including the theoretical background, behavioral intentions and data used, can be found in Table 1.1. The chapters of this dissertation are written as stand-alone scientific papers and can thus be read separately. Chapter 5 concludes with a summary and the relevance of our findings and offers directions for future research.

Table 1.1: Overview of chapters and data used

Ch.	Study	Theoretical framework	Behavioral intentions	Panel	Sample	Data
1	Introduction					
2	Savings adequacy uncertainty: driver or obstacle to increased pension contributions?	Precautionary saving motives Choice deferral	Savings intention Information search intention	Household panel	Age 25-65	Survey (N = 765)
3	Promoting later planned retirement: impact of construal level intervention reverses with age.	Stable chronic preferences Construal level theory	Planned retirement age	Online panels	Age 40-60	Pre-test manipulation check (N = 102) Pre-test temporal distance (N = 122) Experimental study (N = 306)
4	Saving more or retiring later? A study into the determinants of retirement planning heterogeneity.	Theory of planned behavior	Savings intention Planned retirement age	Online panel / Household panel	Age 25-65 (only main wage earners)	Online survey (N = 1472) Survey (N = 468)
5	Conclusion and discussion					

Chapter 2

Savings Adequacy Uncertainty: Driver or Obstacle to Increased Pension Contributions?[1]

ABSTRACT

Deciding how much to save for retirement is a difficult task that includes many uncertainties. In this paper, we use data from a representative Dutch household panel to study the impact of uncertainty regarding one's savings adequacy on retirement savings contributions and information search processes. We combine ideas from the literature in psychology and economics that provide opposing predictions regarding the impact of uncertainty on retirement savings contributions. Our results indicate that the effect of uncertainty is moderated by two factors: an individual's perceived adequacy of current savings and that individual's financial constraints. In particular, we find that uncertainty increases retirement contributions for those who believe that they save adequately; however, it hinders retirement contributions for those who believe that they save inadequately. This effect of uncertainty is further moderated by the availability of financial means: a reduction in uncertainty results in greater contributions to savings only when financial constraints are absent. We also find that uncertainty has both indirect and direct effects on savings information search. In particular, uncertainty indirectly affects savings information search because it impacts individuals' intentions to save, which consequently forces individuals to engage in purchase-oriented information search; however, uncertainty also has a direct effect because individuals engage in ongoing information search processes to directly reduce uncertainty. The implications of these findings are discussed.

[1] This chapter is based on Van Schie, Donkers & Dellaert (2011, 2012).
Authors' contributions: R. van Schie set up the research design and questionnaire, collected and analysed the data, and drafted the manuscript. B. Donkers en B. Dellaert provided expertise related to the design of the study, interpretation of the results and assisted in (re)writing the manuscript. All authors approved the final manuscript.

2.1 Introduction

In recent years, individuals in many developed economies around the world have become increasingly responsible for their retirement savings. As a result of a shift from defined benefit to defined contribution pension plans, for example, individuals now confront a wide array of savings decisions (e.g., Lusardi & Mitchell, 2007b). By now, it is well recognized that individuals are very passive in making these decisions (Choi, Laibson, Madrian, & Metrick, 2002). As a consequence, there is a clear need for increased saving activities for retirement. For example, almost half of the American working population is not confident that they will be able to live comfortably after retirement (Helman, Copeland, & VanDerhei, 2010). Similarly, in the Netherlands, many workers believe that future pension income alone will not be sufficient to make ends meet (AFM, 2011). However, attempts to stimulate retirement saving behavior by entities such as policy makers or companies selling retirement savings products are hampered by the same passive attitude that causes the saving problem. In particular, individuals who do not actively think about their retirement savings cannot be effectively advised regarding their need for additional savings and the products that match their specific requirements. Given the importance of increased retirement savings, there is a surprising lack of research that addresses the processes underlying individuals' tendencies to start additional savings contributions (Croy, Gerrans, & Speelman, 2010a; Hershey, Jacobs-Lawson, McArdle, & Hamagami, 2007).

A *rational* individual should start saving more when current savings are inadequate to provide financial support during retirement. However, evaluating whether current savings are adequate is a daunting task that involves a complex and ongoing process of forecasting future needs and resources. Recent research has acknowledged the role of subjective uncertainty in explaining behavior in such complex situations (for a review, see Osman, 2010). Although we expect that individuals have some notion regarding the adequacy of their current retirement savings, the feeling of uncertainty surrounding their expectations is also likely to affect their saving behaviors. From a theoretical perspective, however, there are no clear predictions regarding the effects of uncertainty on saving behaviors. Our main objective, therefore, is to investigate subjective uncertainty (towards savings adequacy) as a potentially important driver for individuals to save more and to search for retirement savings information (e.g., Lipshitz & Strauss, 1997). In accordance with Osman (2010), we define savings adequacy uncertainty as one's subjective confidence in predicting whether current retirement savings are adequate or not.

Our first contribution is that we combine insights from psychology and economics that address the behavioral responses to savings adequacy uncertainty. This issue is of

particular interest, as research in psychology and in economics has generated opposing predictions regarding the impact of uncertainty on retirement savings contributions, which suggests that the impact of uncertainty operates through two different mechanisms. First, the psychological literature on choice deferral predicts a negative effect on savings contributions because individuals respond to uncertainty by postponing decisions. Individuals tend to put off making decisions to a greater extent as the complexity of the decision task increases (Iyengar, Huberman, & Jiang, 2004; Tversky & Shafir, 1992). By contrast, the economic literature on precautionary saving predicts a positive effect from greater uncertainty. The assumption underlying this theory is that individuals cope with uncertainty by increasing the level of wealth accumulation to buffer against unexpected future decreases in income or increases in expenses (Carroll & Kimball, 2008; Hubbard, Skinner, & Zeldes, 1995; Lusardi, 1997).

We propose that the effect of savings adequacy uncertainty is moderated by perceived savings adequacy, defined as an individual's expectations of whether current retirement savings are adequate or inadequate for a comfortable retirement. In line with the psychological literature, we expect that savings adequacy uncertainty decreases savings contributions for those who think they save inadequately, as uncertainty results in a less compelling incentive to change behavior. However, in accordance with previous literature regarding precautionary saving, uncertainty is predicted to increase savings contributions for those who think they save adequately, and thus should ordinarily have no incentive to begin additional saving behaviors.

Second, we introduce financial constraints as another potential moderator for the effect of savings adequacy uncertainty on individuals' retirement savings contributions. Financial constraints refer to an individual's financial ability to make additional savings contributions. Such constraints may deter individuals from making additional savings contributions simply because there are no financial means to take action. To examine this additional moderating effect, we analyze the three-way interaction among savings adequacy uncertainty, perceived savings adequacy and financial constraints.

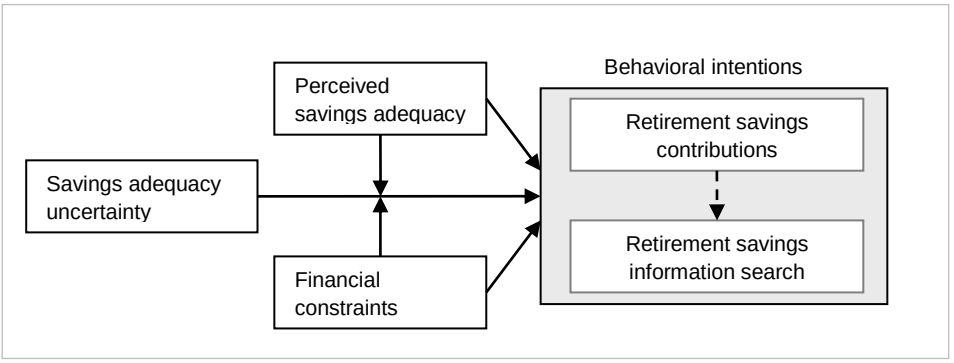
Finally, we examine the effect of savings adequacy uncertainty on retirement savings information search. We distinguish between search behavior that is related to making additional savings contributions and unrelated search behavior. The goal of this analysis is to better understand whether information search is only motivated by the specific decision-making process required to support additional savings contributions (e.g., Punj & Staelin, 1983), or if information search also results from a need to directly cope with uncertainty without a purchase decision in mind (e.g., Bloch, Sherrell, & Ridgway, 1986).

This paper's findings also have important policy implications. In particular, we provide valuable insights regarding individuals who are at risk of not preparing adequately for retirement. Although a substantial proportion of individuals in this group would benefit from reading more retirement savings information because it might reduce uncertainty and hence induce them to start saving more, our results suggest that merely passively providing them with information may not be very effective, simply because these individuals are not very likely to look at that information themselves. Hence, an active approach is needed to inform and motivate such individuals to adequately prepare for retirement.

2.2 Retirement savings decisions

In this section, we develop a conceptual model, summarized in Figure 2.1, that explains individuals' intentions to make retirement savings decisions. A distinction is made between two important stages in this process, namely, the decision to start saving (or save more) for retirement and the decision to search for retirement savings information. We focus on three important drivers of retirement saving behavior: perceived savings adequacy, savings adequacy uncertainty and financial constraints. The core question addressed by this research is the role uncertainty plays in the retirement savings decision process, as there exist opposing predictions for its consequences.

Figure 2.1: A conceptual model of individuals' intentions to make retirement savings decisions



2.2.1 Retirement savings contributions

In this study, we analyze individuals' intentions to make additional savings contributions during the next 12 months. A first step in shaping these intentions is to

actively decide on one's pension savings requirements. This step is crucial, as individuals often postpone such complex decisions (Dhar, 1997). Indeed, Choi et al. (2002), among others, have shown that individuals are not very eager to take active responsibility for increasing their retirement savings. This is reflected by the fact that individuals are heavily influenced by the proposed retirement default option, which implicitly lets others make retirement-related financial decisions for them. In particular, participation rates in default retirement plans appear to be substantially higher under automatic enrollment, and once participants enroll, they make few active changes to the default savings rate and conservative investment choices that are set for them (Beshears, Choi, Laibson, & Madrian, 2008; Choi et al., 2002; Madrian & Shea, 2001). Despite this evidence of a passive approach to retirement preparation, the conditions that lead individuals to take more active control over their retirement savings remain poorly understood. Still, there is a clear need for individuals to take a more active saving approach. For example, more than 40% of the American working population (36-62 years) may be at risk of not having adequate retirement resources to meet either basic retirement expenditures or uninsured health care costs (VanDerhei & Copeland, 2010).

In the Netherlands, unlike in the US, a host of saving responsibilities for retirement are performed and organized at a collective level. Sources such as Van Rooij, Lusardi, and Alessie (2011) and Hershey, Henkens, and van Dalen (2007) provide extensive descriptions of these collective responsibilities. In particular, in addition to a pay-as-you-go public pension scheme (AOW), more than 90% of Dutch employees are covered by mandatory pension saving plans. However, for many different reasons, e.g., periods of unemployment or self-employment, job changes, or uncertainty surrounding the indexation and adjustments of DB pensions, a large number of Dutch workers are at risk of not preparing adequately for retirement (Van Rooij et al., 2011). In fact, only 31% of Dutch workers are confident that they will not have to set aside their own additional savings to ensure that their gross income after retirement will be sufficient for their needs, whereas more than 20% of these workers expect that they will need to cut expenses after retirement (AFM, 2011).

2.2.2 Retirement savings information search

Once individuals have recognized that they need to save more for retirement, they will need to gather information to learn more about savings products and retirement planning, as many individuals lack the necessary information to adequately support a savings decision. For instance, almost half of the Dutch non-retired population (18-64

years) has never considered their income and expenses after retirement (Wijzer in Geldzaken, 2011). Similarly, only 46% of American workers have calculated how much they will need to save for retirement. However, those workers who did calculate this total are more confident that they will be able to accumulate the amount they need for retirement (Helman et al., 2010). The search for more information regarding retirement is therefore an important factor impacting improved retirement saving behavior and an integral part of consumer decision making (e.g., Howard & Sheth, 1969).

In this study, we focus on individuals' intentions to acquire information regarding pension planning. Individuals may acquire retirement savings information for several reasons. Certain individuals might search for specific product-related information because they intend to adjust their current savings levels. For example, to make a well-informed saving decision, an individual may need to collect information regarding which financial products fit his requirements or provide relevant tax benefits. Other individuals might not be considering specific changes in their saving practices, but might simply be looking for more general information addressing topics such as how to establish their desired savings level or increase their retirement knowledge.

Existing information acquisition research has mainly focused on the former situation, in which consumers search for information with a specific purchase goal in mind, i.e., they know what product they want (Beatty & Smith, 1987; Moorthy, Ratchford, & Talukdar, 1997; Urbany, Dickson, & Wilkie, 1989). This type of search behavior has been referred to as goal-directed search. The other scenario, in which individuals acquire information when no specific purchase is considered, is referred to as ongoing search (Bloch et al., 1986; Janiszewski, 1998; Moe, 2003). The latter search type is particularly relevant given that savings goals for retirement are often not particularly well defined, and the environment in which savings decisions are made is subject to continuous change. For example, in many European countries, the question of whether the eligible retirement age should be raised frequently arises (Bloomberg Business, 2010). As a response, individuals might engage in ongoing information search to stay informed about these potential changes, without directly considering the adjustment of their current retirement savings.

Until now, little has been known about factors that differentiate individuals who search for retirement information from those who do not, let alone the factors that affect either goal-directed or ongoing retirement information search. We study the role of uncertainty in retirement savings information search, where we differentiate between its impact on goal-directed search behavior that is related to the decision to save more (i.e., purchase-oriented retirement information search) and search behavior that is unrelated to additional savings (i.e., ongoing retirement information search). Hence, we examine

whether uncertainty has a direct effect on information search or only affects information search indirectly because of its effect on the decision to make extra savings contributions.

2.2.3 Perceived savings adequacy

The first driver of retirement saving behavior in our conceptual model is the perceived adequacy of individuals' current savings levels. The adequacy of individuals' retirement savings has received considerable attention (e.g., Scholz, Seshadri, & Khitatrakun, 2006; Skinner, 2007), and although the views of savings adequacy expressed in published studies are widely divergent, there is general consensus that at least some households are saving for retirement in a suboptimal manner. More surprising is the finding that individuals are generally aware that their retirement saving behavior is not optimal (Clark, d'Ambrosio, McDermed, & Sawant, 2004). For example, Choi et al. (2002) observe that two-thirds of employees at a large US food corporation report that their current retirement savings rate is "too low" relative to their ideal savings rate. Of those respondents who indicated that their savings rate is too low, only a small fraction actually increased their savings contribution rate in the subsequent few months. Thus, an important question is why simply being aware of inadequate retirement savings is not always sufficient to induce additional retirement saving behavior.

2.2.4 Savings adequacy uncertainty

One reason why an anticipated lack of sufficient savings for retirement is not acted upon by increasing saving activities is the uncertainty surrounding the perceived savings adequacy. In accordance with Osman (2010), we define uncertainty as individuals' subjective confidence in their prediction of whether they save enough for retirement or not. Previous research has shown that many individuals are poor at estimating the balance between financial needs and financial resources during their retirement years (e.g., Hershey, Walsh, Brougham, Carter, & Farrel, 1998). Thus, one would expect that individuals perceive substantial uncertainty when deciding how much to save for a comfortable retirement. The effect of uncertainty on retirement saving behavior, however, is not unequivocal, as uncertainty may either positively or negatively affect retirement savings decisions, according to different theories in psychology and economics.

First, the psychology literature indicates that individuals might postpone decisions in response to uncertainty. Lipshitz and Strauss (1997) describe uncertainty in the context of action as a sense of doubt that blocks or delays action. This definition is consistent with

empirical studies of choice deferral in psychology and marketing. For example, Dhar (1997), Luce (1998), and Tversky and Shafir (1992) demonstrate that individuals are more inclined to postpone their product choice in complex decisions. In an analysis of the decision processes that lead to this deferral behavior, Dhar (1997) shows that individuals who expressed a greater number of thoughts or had relatively equal numbers of favorable evaluations regarding several different options, and therefore presumably faced greater preference uncertainty in the choice task, were more likely to defer their decision. These findings are consistent with a systematic bias toward indecision in retirement decision making (e.g., Choi et al., 2002; Madrian & Shea, 2001).

By contrast, whereas the psychology literature predicts less action under uncertainty, the literature in economics suggests that uncertainty results in more action, which in this case would constitute additional retirement saving behaviors. In fact, precautionary saving, defined as the additional saving resulting from the knowledge that the future is uncertain, is considered to be one of the most important motives to save, as discussed by Carroll and Kimball (2008) in a recent review. Most research in the precautionary saving literature has focused on the relationship between earnings uncertainty and wealth accumulation (e.g., Carroll & Samwick, 1998; Lusardi, 1997). In general, these studies find that individuals increase the accumulation of wealth as a type of self-insurance against adverse income shocks. In addition to income uncertainty, other risk factors, such as lifespan uncertainty, health uncertainty, and uncertainty about medical expenses, are important precautionary motives as well (Davies, 1981; Hubbard et al., 1995; Palumbo, 1999). Taken as a whole, precautionary saving theory posits that individuals create a savings buffer to remain in sound financial situations in the future, even if they are subjected to unexpected negative changes in income or expenditures.

Because psychology and economics predict opposing effects of uncertainty, we consider the circumstances under which choice deferral is more (vs. less) influential than precautionary savings as a driver of savings intentions. First, we consider individuals who believe that they save inadequately, and hence should have a rather concrete reason to increase savings. These individuals should (rationally) perceive a strong incentive to start saving extra. However, when uncertainty is high, the fact that an individual is at risk of saving inadequately might not be part of that individual's direct experience (Wakslak, Trope, Liberman, & Alony, 2006). As a consequence, for those who think they save inadequately, a higher level of uncertainty results in less clear preferences for the decision of whether to increase savings for retirement, resulting in choice deferral and a lower intention to start additional savings. By contrast, when individuals believe that they save adequately and hence have no concrete reason to increase savings, but they feel uncertain

about this belief, they are likely to engage in (precautionary) saving to reassure themselves that they indeed do save enough for retirement. In summary, the net effect of uncertainty on savings intentions will be increasing with the level of perceived savings adequacy.

We formulate two expectations concerning the effect of uncertainty on information search. First, when individuals have decided to start saving more, they should search for purchase-oriented information to make a proper choice. Therefore, we expect that uncertainty has an indirect effect on information search through its impact on savings intentions. Second, we expect that uncertainty has a direct effect on information search that is unrelated to the decision to save more. Even when individuals do not consider adjusting their retirement savings, they may still use ongoing information search to directly cope with uncertainty, such as uncertainties about future pension benefits and requirements. Indeed, behavioral decision theories indicate that information search can be a very relevant strategy to directly reduce uncertainty (e.g., Lipshitz & Strauss, 1997).

2.2.5 Financial constraints

The relationship between savings adequacy uncertainty and retirement savings decisions will be further affected by an individual's financial ability to increase contributions. In particular, a lack of available financial resources can act as a constraint when planning for retirement (e.g., Bernheim & Scholz, 1993; Lusardi & Mitchell, 2007a). It has been demonstrated, for example, that individuals with the lowest income are at the highest risk of running short of money in retirement (VanDerhei & Copeland, 2010). In our study, we do not focus on income per se, but rather on an individual's financial ability to change his savings level, which is based on his projected expenditures and income for the next year. Although some individuals might perceive their current pension savings as inadequate and hence feel an urge to better prepare for retirement, they might simply not be able to make additional savings contributions. Therefore, we expect that the interaction effect of uncertainty and perceived savings adequacy is conditional on individuals' financial abilities. In particular, for those who believe they save inadequately, a reduction in uncertainty should result in a greater intention to create additional retirement savings only when financial constraints are absent. Therefore, we expect that there will be a negative three-way interaction effect among savings adequacy uncertainty, perceived inadequate savings, and the absence of financial constraints on savings intention.

2.2.6 Control variables

Retirement saving tendencies are heterogeneous among individuals. Previous evidence demonstrates that individuals' variance in retirement planning and savings decisions can be partly explained by their socio-demographic and psychological characteristics (e.g., Hershey, Jacobs-Lawson et al., 2007). Given these results from the extant research, we include financial literacy, retirement goal clarity, and retirement income knowledge as control variables for this investigation.

Financial literacy – Lusardi and Mitchell (2007b) suggest that simply planning for retirement has a significant effect on savings. Insufficient financial knowledge is one important reason why many people may not plan. In fact, Lusardi and Mitchell (2007b) demonstrate that financial literacy influences planning tendencies and that planning, in turn, increases wealth accumulation.

Goal clarity – Several studies demonstrate that having clear goals for retirement is a significant predictor for retirement planning activities and saving tendencies (e.g., Hershey, Henkens, & van Dalen, 2007; Hershey, Jacobs-Lawson et al., 2007). Long-term goals serve to specify a behavioral plan that ultimately leads to goal fulfillment (e.g., Beach & Mitchell, 1987). Hence, the more concrete an individual's concept of retirement is, the easier it will be for that individual to save.

Retirement income knowledge – Empirical evidence is growing that individuals' knowledge of future retirement benefits affects their retirement decision making. Recent work by Chan and Stevens (2008), for example, demonstrates that individuals who are well informed about their pensions are far more responsive to pension incentives than the average individual.

Other controls – We also control for risk aversion, past information search activities, and previous savings, as past behavior is often an important predictor of behavioral intentions (e.g., Bagozzi & Dabholkar, 1994). Furthermore, we include a wide set of socioeconomic and demographic control variables.

2.3 Data and methodology

2.3.1 Measurement

Additional savings and information search intention

For the two dependent variables, we measure individuals' intentions to make additional savings contributions and their intentions to search for retirement savings information in the next 12 months. We asked individuals, "In the next 12 months, do you expect to make extra contributions in order to supplement your income after retirement?"

The answers were measured on a seven-point scale, ranging from "certainly not" to "certainly", and used as indications of intended additional savings. Intentions to conduct information search were measured on a five-point scale ranging from "disagree" to "agree" in response to the following two statements: "In the next 12 months I expect to calculate how much money I need to save to retire comfortably", and "In the next 12 months I expect to collect information about financial planning and pensions". These metrics were based on the retirement planning scale of Hershey, Henkens, and van Dalen (2007). The data obtained from responses to these two statements prove to be reliable (Cronbach's alpha = .91), and we use the average score to form the composite information search intention scale.

We measure intentions because in mainstream psychological models, the likelihood that an individual performs a particular behavior is an increasing function of the strength of his intention to engage in that behavior (e.g., Ajzen, 1991). A host of previous research, by contrast, has focused on past retirement saving behavior (e.g., total accumulated wealth). However, we cannot use measures of past saving behavior in this research, as our objective is to uncover how perceived uncertainty and savings adequacy affect current savings decisions. Hence, observing only past behavior, such as accumulated retirement wealth or an individual's savings rate in a pension plan, would not reveal these effects because *current* levels of perceived uncertainty and savings adequacy are the result and not the cause of *past* saving behavior.

Perceived savings inadequacy

To measure individuals' perceived savings adequacy, we use a metric to gauge whether individuals perceive their current retirement savings to be adequate to permit them to retire comfortably. In particular, in accordance with Hershey, Henkens, and van Dalen (2007), we measure perceived savings adequacy using a five-point scale ranging from "totally inadequate" to "totally adequate" to collect responses to the following question: "Based on how you expect to live in retirement and given that you do not adjust your current saving behavior, do you expect to have adequate financial resources to retire comfortably?" We divide the respondents into two groups based on whether they perceive their current saving behavior as adequate (0) or inadequate (1).

Much other research on savings adequacy used objective measures of savings adequacy (e.g., total wealth accumulation, replacement rates, retirement plan contributions). There are at least two important reasons in favor of using a subjective measure for savings adequacy in our study. First, there is no standard retirement adequacy measure against which to measure the observed saving behavior of individuals or

households (Scholz et al., 2006, p. 608). As a consequence, views of savings adequacy for retirement are widely diverging (Skinner, 2007). Second, previous research has indicated that subjective variables can have strong effects on financial decision making (e.g., Donkers & van Soest, 1999).

Savings adequacy uncertainty

Savings adequacy uncertainty was measured (after reverse coding) using a seven-point scale ranging from "very certain" to "very uncertain" to collect answers to the following question: "You indicate that you expect to have (inadequate/ adequate) financial resources to live comfortably during retirement. How certain are you that your expectation turns out to be true?"

Financial constraints

To account for an individual's financial ability to change his savings level, we use a question which is answered by panel respondents every year. In particular, on a five-point scale ranging from "expenditures will be much higher than income" to "expenditures will be much lower than income", respondents answered the question: "When you think of the NEXT 12 MONTHS, do you think the expenditures of your household will be higher than the income of the household, about the same as the income of the household, or lower than the income of the household?"

Control variables

Details regarding the control variables can be found in Appendix A. As control variables, we include financial literacy, goal clarity, income knowledge, past information search activities and savings, risk aversion, gender, education, household income, number of children, partner, main wage earner of the household, financial administrator of the household, availability of a pension fund and primary occupation.

2.3.2 Sample

Our model of retirement savings decisions is empirically tested using data collected through a Dutch household panel of CentERdata. This panel is representative of the Dutch population. CentERdata collects a vast array of detailed information about an individual's financial, psychological and socio-demographic situation. In addition to this general data collection, supplementary questionnaires can be tailored to collect information regarding specific parameters of interest. Respondents from the panel were selected that were

between ages 25 and 65 because these respondents are most likely to be responsible for making retirement savings decisions. We only include respondents that are not yet retired and are not attending college. Our final sample consists of 765 respondents who provided complete information to us.

In our sample, 22% of the respondents perceive their current saving behavior as inadequate. Respondents reported a mean score of 3.6 for the level of uncertainty (measured on a scale from 1 to 7) when predicting whether they save adequately or not. In accordance with the reports of other studies (e.g., Choi et al., 2002), our sample also demonstrated low behavioral intentions, with mean values of 2.5 (scale 1 – 7) and 1.9 (scale 1 – 5) for an individual's additional savings intention and information search intention, respectively. Table A.2 (Appendix A) describes the sample in greater detail.

2.3.3 Model

To elucidate the relationship between perceived savings adequacy, savings adequacy uncertainty, financial constraints and intended retirement saving behavior, we use the ordered logit model, as additional savings intention and information search intention are both measured as ordinal variables with seven and eight[2] categories, respectively (Greene, 2003, p. 736). The ordered logit model for a variable with J ordered categories reads as follows:

$$\text{Intention}^* = X'\beta + \varepsilon$$

where

$$\begin{aligned} &\text{Intention} = 1 \quad \text{if intention}^* \leq \alpha_1 \\ &\text{Intention} = j \quad \text{if } \alpha_{j-1} < \text{intention}^* \leq \alpha_j \quad \text{for } j = 2,\ldots, J-1 \\ &\text{Intention} = J \quad \text{if } \alpha_{J-1} < \text{intention}^* \end{aligned}$$

Here intention* represents a latent variable, and α_1 to α_{J-1} are unobserved thresholds that satisfy $\alpha_1 \leq \alpha_2 \leq \ldots \leq \alpha_{J-1}$. X contains all explanatory variables, and ε is the error. We mean center our measures of savings adequacy uncertainty and financial constraints to enhance the interpretation of the results, given the presence of interactions. Thus, the signs of the coefficients for these explanatory variables can be interpreted relative to the population mean.

[2] Information search is measured with two questions on a 5-point scale. Because the average score of 4.5 is not present, we have 8 instead of 9 categories.

2.4 Results

2.4.1 Intention to make retirement savings contributions

Table 2.1 presents the estimation results for an individual's additional savings intention. To test our expectations, we estimate a three-way interaction effect model, in which we include our three independent variables of interest. First, we find a positive main effect for the dummy variable of inadequate savings (β = .433; p = .020). Second, we find a positive main effect of uncertainty (β = .233; p = .001). For those with inadequate savings, however, the positive effect of uncertainty vanishes because of its negative interaction effect with inadequate savings (β = -.206; p = .080). Moreover, in line with our expectations, the effect of uncertainty even reverses if individuals are not financially constrained, which is indicated by a significant three-way interaction effect among the variables inadequate savings, savings adequacy uncertainty and financially unconstrained (β = -.491; p = .000). As is clear from our results, the interactions in our model play an important role. A test on the joint significance of all interactions also supports this (χ^2 = 11.97, d.f. = 4, p = .018).

To enhance its interpretation, the three-way interaction effect is graphically illustrated in Figure 2.2. This figure illustrates how our three variables of interest influence the intention to make additional savings contributions in the next 12 months. To do so, we calculate predicted savings intentions, using the estimated logit model, for all combinations of the dummy variable inadequate savings (0 vs. 1), the 25^{th} and 75^{th} percentile for uncertainty (4 vs. 6), and the same percentiles for financial constraints (3 vs. 4). We hold all other control variables constant at the sample average, and plot the predicted values.

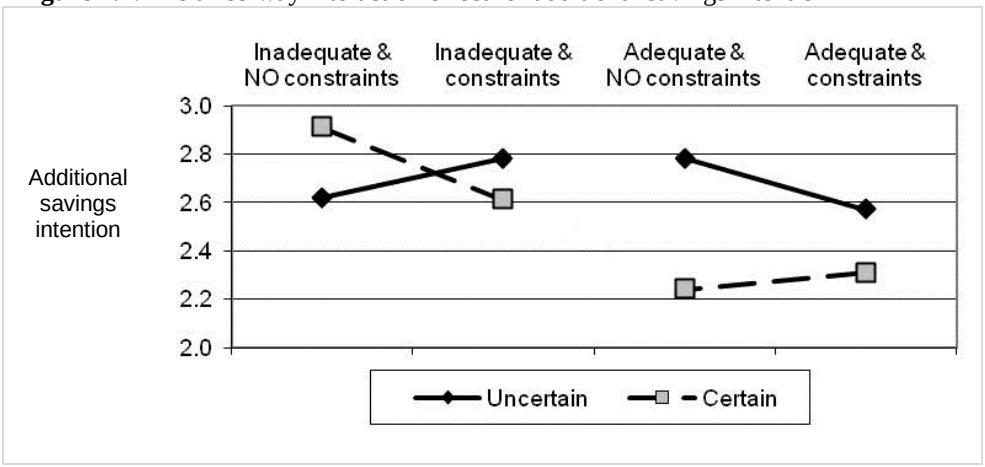
Two findings in this figure are particularly interesting and improve our understanding of the reported three-way interaction effect. First, for those who believe they save adequately, uncertainty has a positive effect on additional savings intention ($\text{Intention}_{\text{High vs. Low Uncertainty}}$ = 2.78 vs. 2.24 and 2.57 vs. 2.31 for the financially unconstrained and constrained, respectively). This positive effect of uncertainty is in accordance with the economic precautionary saving motive discussed previously. Second, for those who think they save inadequately, uncertainty and financial ability are both important factors in explaining additional savings intentions. Individuals who are certain that they save inadequately and are financially unconstrained have the highest intention to save more ($\text{Intention}_{\text{Low Uncertainty}}$ = 2.91). For this group of individuals, uncertainty has a negative effect on additional savings intentions ($\text{Intention}_{\text{High Uncertainty}}$ = 2.62).

Table 2.1: Estimation results of additional savings intention

	Savings intention		
	β		St. error
Inadequate savings	.433	*	.186
Financially unconstrained	.011		.105
Uncertainty	.233	**	.069
Inadequate x uncertainty	-.206		.118
Inadequate x financially unconstrained	.193		.221
Financially unconstrained x uncertainty	.192	*	.078
Inadequate x uncertainty x financially unconstrained	-.491	**	.140
Income knowledge	.035		.099
Goal clarity	.172		.100
Financial literacy	-.173		.107
Risk aversion	-.099	*	.050
Past information	.296	**	.072
Past savings	.237	**	.040
Demographic control variables			
Age	-.011		.009
Female	.205		.187
Number of children	-.055		.067
Education	.009		.030
Partner	.273		.213
Household income	-.194	**	.072
Main wage earner	.082		.221
Financial administrator	.148		.162
Pension fund	-.253		.237
Dummy pension fund missing	.089		.272
Employee	.		.
Works in own business	1.605		.918
Self-employed	.202		.336
Unemployed	-.734		.549
Works in own household	-.364		.270
(Partly) disabled	-.145		.280
Unpaid work	-2.116	*	1.056
Works as a volunteer	.263		.602
Other occupation	-.375		.739
Cutoff values			
C1	-.412		.827
C2	1.011		.827
C3	1.811	*	.829
C4	3.102	**	.836
C5	4.123	**	.850
C6	5.063	**	.881
No. of observations	765		
Pseudo R-square	.177		

* $p < .05$, ** $p < .01$.

Figure 2.2: The three-way interaction effect for additional savings intention



Note: Additional savings intention scale from 1 (*certainly not*) to 7 (*certainly*).

When we contrast the negative effect of uncertainty for those who are not financially constrained with the effect of uncertainty for those who are financially constrained, we find a significant difference (p = .010); thus, the effect of uncertainty is moderated by financial constraints. This negative impact of uncertainty on savings intentions is consistent with the literature on choice deferral. Overall, these results support our expectation of opposing roles for uncertainty, as its impact depends on perceived savings adequacy and financial constraints.

2.4.2 Intention to search for retirement savings information

In Table 2.2, we present the results of two ordered logit models for individuals' intention to search for retirement savings information. In both models, we use the composite information search intention scale as the dependent variable. The difference between the two models is that we control for additional savings intentions in our second model to demonstrate the effects of our variables on search behavior that is not caused by these intentions. Therefore, in model 1, the coefficients can be interpreted as overall effects on retirement search behavior, which can be either related or unrelated to intended additional savings contributions. In model 2, the coefficients can be interpreted as the consequences for search behavior that is unrelated to intended additional savings contributions, i.e., ongoing retirement information search.

Table 2.2: Estimation results of information search intention

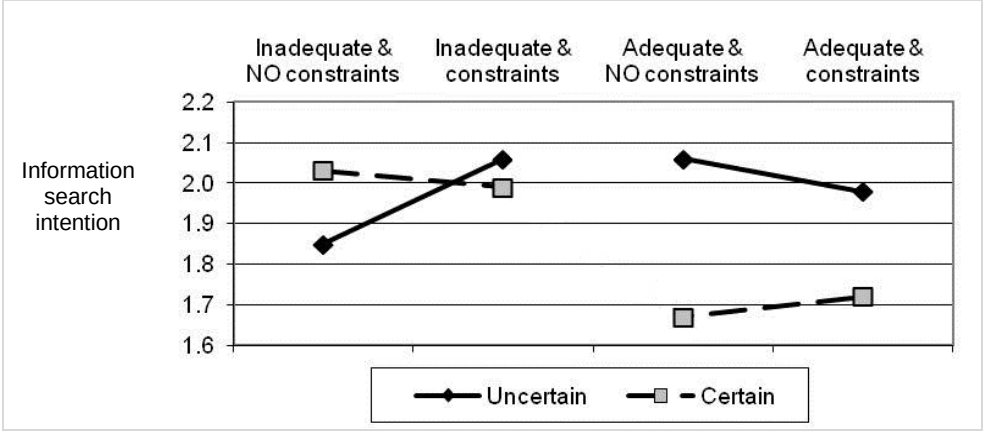
	Model 1: Overall search intention			Model 2: Search intention, separating out additional savings intention		
	β		St. error	*β*		St. error
Inadequate savings	.436	*	.193	.094		.203
Financially unconstrained	-.034		.111	-.127		.117
Uncertainty	.319	**	.073	.201	**	.078
Inadequate x uncertainty	-.321	**	.124	-.265	*	.133
Inadequate x financially unconstrained	-.048		.228	-.160		.240
Financially unconstrained x uncertainty	.133		.081	.079		.088
Inadequate x uncertainty x financially unconstrained	-.385	**	.145	-.213		.154
Income knowledge	.185		.104	.216		.111
Goal clarity	.309	**	.105	.256	*	.112
Financial literacy	-.169		.113	-.132		.119
Risk aversion	-.098		.052	-.034		.056
Past information	.664	**	.077	.563	**	.081
Past savings	.053		.041	-.092	*	.045
Additional savings intention				1.061	**	.065
Demographic control variables						
Age	-.002		.009	.002		.010
Female	.057		.195	-.070		.205
Number of children	-.171	*	.071	-.156	*	.075
Education	.002		.032	.014		.034
Partner	-.017		.219	-.272		.230
Household income	-.063		.074	.056		.078
Main wage earner	.030		.231	.039		.242
Financial administrator	.274		.171	.196		.180
Pension fund	.167		.256	.255		.271
Dummy pension fund missing	.552		.292	.489		.307
Employee	.		.	.		.
Works in own business	-.544		.988	-1.864		1.062
Self-employed	-.233		.358	-.587		.382
Unemployed	-.307		.557	.273		.575
Works in own household	-.266		.290	.126		.303
(Partly) disabled	-.361		.295	-.286		.312
Unpaid work	-1.158		1.064	-.291		1.198
Works as a volunteer	-1.594	*	.755	-2.526	*	.867
Other occupation	-.433		.772	-.265		.811
Cutoff values						
C1	1.766	*	.868	4.116	**	.934
C2	1.913	*	.868	4.304	**	.936
C3	3.252	**	.873	6.086	**	.950
C4	3.529	**	.875	6.467	**	.953
C5	4.852	**	.885	8.288	**	.974
C6	5.174	**	.889	8.727	**	.980
C7	6.732	**	.928	10.636	**	1.031
No. of observations	765			765		
Pseudo R-square	.224			.483		

* $p < .05$, ** $p < .01$.

Model 1 illustrates the results of overall retirement search behavior. We find results that are very similar to the results that were obtained for additional savings intention. First, we find a significant positive coefficient for the dummy variable of inadequate savings (β = .436; p = .024), as well as for uncertainty (β = .319; p = .000), which again disappears in situations for which individuals expect to save too little (β = -.321; p = .010). Second, similarly to additional savings intentions, we find a significant three-way interaction effect for our three variables of interest (β = -.385; p = .008).

The fact that the findings for information search intention are similar to those for additional savings intention is also evident from Figure 2.3, in which we graphically represent the three-way interaction effect. For this representation, we use the same procedure described for additional savings intention. Again, the figure indicates that, for individuals who believe that they save adequately, uncertainty results in a higher intention to search for information ($\text{Intention}_{\text{High vs. Low Uncertainty}}$ = 2.06 vs. 1.67 and 1.98 vs. 1.72, for the financially unconstrained and constrained, respectively). In contrast, for those who think they save inadequately, uncertainty results in a lower intention to search for information, but only if individuals are not financially constrained ($\text{Intention}_{\text{High vs. Low Uncertainty}}$ = 1.85 vs. 2.03). Thus, for this "inadequate savings" group, uncertainty deters individuals from considering extra information searches, even though they have sufficient financial means. Overall, observing the same impact of uncertainty on information search intention and additional savings intention supports our notion that individuals engage in (purchase-oriented) information search to support additional savings decisions.

Figure 2.3: The three-way interaction effect for information search intention

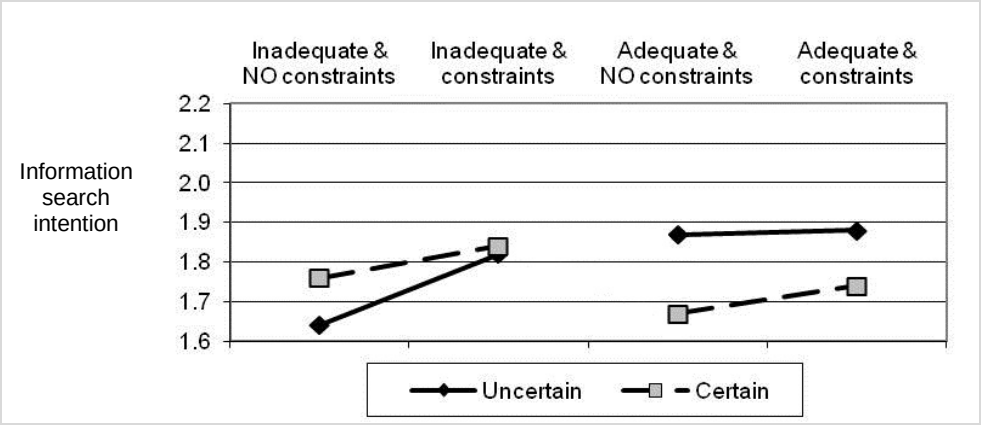


Note: Information search intention scale from 1 (*disagree*) to 5 (*agree*).

In model 2, we control for additional savings intention to observe whether individuals also use information search to lower uncertainty when additional savings are not directly considered (i.e., ongoing information search). As expected, we find a strong and significant effect of additional savings intention (β = 1.061; p = .000). The main effect of uncertainty is positive (β = .201; p = .010), but for those with inadequate savings this effect is fully canceled by the interaction between inadequate savings and uncertainty (β = -.265; p = .046). Furthermore, we see that the three-way interaction effect becomes insignificant (β = -.213; p = .167), indicating that financial constraints no longer have a significant effect. A test of the joint significance of the main effect and all interaction terms with financial constraints also supports this (χ^2 = 4.60, d.f. = 4, p = .33).

In Figure 2.4 we graphically represent this ongoing information search model, which is constructed using the same procedure as before. The figure indicates that individuals who think they save adequately use (ongoing) information search to lower uncertainty ($\text{Intention}_{\text{High vs. Low Uncertainty}}$ = 1.87 vs. 1.67; and 1.88 vs. 1.74, for the financially unconstrained and constrained, respectively). By contrast, for those who think they save inadequately, uncertainty does not drive information search. When we compare this figure with Figure 2.3, which depicts overall search, we see that after controlling for additional savings intentions, the group characterized by "inadequate savings, uncertainty, and no financial constraints" demonstrates a particularly low intention to search for information. Two alternative explanations may underlie this finding. First, individuals in this group may be relatively uninvolved in the retirement decision process, and thus may focus on information search only when it is necessary to support an additional savings decision. Individuals in other groups, by contrast, may have a higher level of continuing involvement in retirement decisions, and hence may evince a relatively greater focus on ongoing information search to stay informed about changes in the retirement decision environment (e.g., Bloch et al., 1986). Second, searching for more information might elicit negative emotions because it confronts these individuals with their savings problem. The desire to minimize such negative emotions might therefore be another reason why they do not think about their retirement savings and thus do not search for information (Luce, 1998). According to this argument, ongoing information search would evoke more positive emotions for those seeking reassurance that they do indeed save adequately.

Figure 2.4: The three-way interaction effect for information search intention after separating out the additional savings intention



Note: Information search intention scale from 1 (*disagree*) to 5 (*agree*).

2.4.3 Additional analysis: determinants of uncertainty

An understanding of the factors that determine the level of perceived uncertainty is important for those who are responsible for providing individuals with information to lower that uncertainty. Therefore, as shown in Table 2.3, we conduct another ordinal regression analysis using savings adequacy uncertainty as the dependent variable. We control for the same socio-demographic and individual variables as in the previous analyses, and find that retirement income knowledge, retirement goal clarity, financial literacy, and risk aversion have a significant negative impact on perceived savings adequacy uncertainty. The insignificant influence of past information search behavior might be somewhat surprising. However, once we exclude retirement goal clarity, financial literacy and, in particular, income knowledge, the influence of past information search becomes significantly negative. This suggests that the impact of past information search is mediated by goal clarity, financial literacy and, most importantly, income knowledge. Excluding the same set of variables does not result in a significant effect for past savings, suggesting that these variables do not mediate the impact of past savings practices.

Table 2.3: Determinants of savings adequacy uncertainty

	Savings adequacy uncertainty		
	B		St. error
Inadequate savings	-.231		.169
Financially unconstrained	-.055		.092
Income knowledge	-.813	**	.096
Goal clarity	-.378	**	.099
Financial literacy	-.334	**	.104
Risk aversion	-.142	**	.049
Past information	.016		.071
Past savings	.013		.038
Demographic control variables			
Age	-.008		.009
Female	.103		.184
Number of children	.069		.066
Education	.016		.030
Partner	-.015		.208
Household income	.039		.069
Main wage earner	.334		.218
Financial administrator	.120		.159
Pension fund	-.069		.234
Dummy pension fund missing	.141		.270
Employee	.		.
Works in own business	-1.721		.960
Self-employed	-.377		.335
Unemployed	.946		.520
Works in own household	-.287		.264
(Partly) disabled	.252		.276
Unpaid work	.005		.916
Works as a volunteer	.677		.600
Other occupation	.503		.701
Cutoff values			
C1	-8.511	**	.848
C2	-6.119	**	.818
C3	-4.609	**	.806
C4	-3.187	**	.797
C5	-1.852	*	.795
C6	-.575		.807
No. of observations	765		
Pseudo R-square	.325		

* $p < .05$, ** $p < .01$.

2.5 Conclusion and discussion

2.5.1 Conclusions

This study increases our understanding of individuals' intentions to actively make decisions regarding retirement saving behaviors. In particular, we investigate the role that perceived uncertainty plays in saving for retirement and in searching for retirement savings information. Theories in psychology and in economics provide opposing predictions for the impact of savings adequacy uncertainty on one's intentions to start saving (or to increase one's existing saving practices). We develop a conceptual model to describe these multiple roles of uncertainty and use a unique representative dataset to empirically test our model.

Taken as a whole, the results of this study support our notion that uncertainty either increases or decreases an individual's intention to make additional savings contributions, depending on the specific circumstances. In particular, we demonstrate that the effect of uncertainty depends on two important factors, namely, an individual's perceived savings adequacy and that individual's financial constraints. In accordance with the economic literature regarding precautionary saving, we find that uncertainty results in a higher intention to make additional savings contributions for those who think that they save adequately. By contrast, in accordance with choice deferral literature in psychology, we find that uncertainty leads to a lower savings intention for those who think that they save inadequately. This detrimental effect of uncertainty is conditional on an individual's financial ability, as a reduction in uncertainty results in more savings only if an individual has sufficient financial resources to actually adjust his saving behavior. We also examine the effect of uncertainty on information search in more detail. We find that, on the one hand, uncertainty has an indirect effect on information search, as uncertainty affects an individual's intention for additional savings, which induces a need to search for purchase-oriented information. On the other hand, uncertainty also has a direct effect on information search because individuals, particularly those who think they save adequately, engage in ongoing information search to directly cope with uncertainty.

2.5.2 Discussion

The theoretical implications of our research are fourfold. First, we find support for the idea that we can apply well-established findings about the role of uncertainty in the evaluation and choice of (product) alternatives to an investigation of an individual's intentions to make savings decisions. Specifically, we find evidence for choice deferral in the context of the decision to make extra retirement savings contributions.

Second, our research extends the insights from studies demonstrating that even though many individuals anticipate they are saving inadequately for their retirement, only a few have the intention to actually increase savings (e.g., Choi et al., 2002). Our results provide an explanation for these findings, as we demonstrate that uncertainty and financial constraints are two significant factors affecting the intention to contribute more to savings for those who are currently saving inadequately.

Third, by considering complementary psychological and economic theories of coping with uncertainty, we find that both theories are useful in explaining the impact of uncertainty on retirement savings decisions. For those who save adequately, precautionary motives explain the positive effect of uncertainty, as individuals start saving more to secure themselves against uncertainty. However, for those who save inadequately, the literature on choice deferral explains the negative effect of uncertainty, as uncertainty makes the benefits of adjusting current savings less salient. This psychological effect of uncertainty complements and emphasizes the value of recent studies that seek to find non-economic explanations for retirement saving tendencies (e.g., Hershey, Jacobs-Lawson et al., 2007; Lusardi & Mitchell, 2007a). These studies recognize that individuals are not always the rational, well-informed agents that are assumed by many economic models of saving.

Fourth, our results complement findings in the precautionary saving literature, which has established that individuals start saving more as a response to uncertainty. Note, however, that in the literature regarding precautionary saving, information search plays a far less prominent role, as individuals are often assumed to have access to all relevant information. This assumes that only over time new information will be revealed to the individual regarding economic matters such as job opportunities or stock market performance. By contrast, our results indicate a strong impact of uncertainty on information search. Hence, studying savings as the only consequence of uncertainty might overlook information search as another important behavioral response to uncertainty.

From a managerial perspective, our results provide valuable insights for policy makers and practitioners, who have recently started to introduce new initiatives to make savings decision tasks more transparent. For example, Dutch pension funds are now required to send an annual pension statement (Uniform Pension Statement; UPO in Dutch) to workers who participate in a pension scheme, providing them with information about their estimated pension benefits. Furthermore, many websites have started offering their visitors online retirement calculators to assess how much they should be saving for retirement, as well as online testimonials in which pre-retirees and retired persons share their retirement planning experiences. Policy makers should carefully consider whether

such developments make individuals feel more or less uncertain regarding their savings adequacy expectations. Decision aids that help to reduce uncertainty might be especially beneficial for those with inadequate retirement savings and no financial constraints because a decrease in uncertainty provides these individuals with a strong incentive to start saving more. Although this seems a promising avenue to increase retirement savings for these individuals, our results also indicate that this group of individuals is particularly unlikely to actively search for information. Hence, simply making such tools available online will be ineffective as the tools will not be used by this subset of individuals.

Thus far, the focus of most available financial decision aids has been on providing individuals with information about their retirement income through methods such as the Uniform Pension Statement. Our results indicate that retirement income knowledge is an important factor in decreasing uncertainty. Policy makers should note, however, that simply providing information about expected benefits via the Uniform Pension Statement is only a first step, as our results indicate that the level of uncertainty is affected by more than simply retirement income knowledge alone. For instance, supplementing retirement income information with information about life after retirement could improve an individual's understanding of current savings adequacy. Financial literacy appears to be another important factor to decrease uncertainty. Recent research, however, has not yet found unequivocal results regarding the best means of supporting individuals in improving their financial knowledge (e.g., Lusardi & Mitchell, 2007b).

2.5.3 Limitations and directions for further research

Our study poses several interesting avenues for future research. First, a limitation of this study is that we only focus on individuals' intentions to make retirement savings decisions. Although the likelihood that someone will actually make extra savings contributions will be an increasing function of one's intentions, it will also be affected by procrastination. The study of the relative importance of both factors examined here on actual savings remains an intriguing area for further research. Moreover, it would be interesting to know whether procrastination is also related to uncertainty.

Second, being limited by the available data, we could only find four factors that explain the level of savings adequacy uncertainty. More research is needed to investigate other potential determinants. For instance, questions such as whether uncertainty is primarily affected by individual psychological dispositions or by the unpredictable (external) decision environment could be addressed, and investigations could be conducted to determine the extent to which individual feelings of uncertainty can be reduced. It is

important to attain a better understanding of why individuals perceive uncertainty in determining an adequate level of retirement savings because these reasons will inform the discussion of how to best support those individuals in saving for retirement.

Third, we used data from a Dutch household panel to test our model. As indicated by various researchers, including Hershey, Henkens, and van Dalen (2007), planning and saving tendencies are heterogeneous across countries, in large part due to differences in pension systems. Workers in the US, for example, face much more financial responsibility and uncertainty surrounding future pension payouts than Dutch workers. Therefore, it would be interesting to see if the same results are obtained in other institutional settings.

Finally, our results give rise to additional research that focuses on supporting individuals in their construction of retirement preferences (e.g., Slovic, 1995). In particular, *information acceleration* has been proposed as a valuable tool to assist individuals in understanding new and unfamiliar consumption situations (Urban et al., 1997). In a typical information acceleration process, individuals are invited to explore a rich virtual (online) environment that consists of many different types of information and information formats to learn more about a future situation. Although information acceleration has thus far mainly been used as a tool to support new product development and marketing testing, it seems a promising approach to also support individuals in understanding their future pension needs and preferences. We believe that information acceleration may help individuals decrease their uncertainty regarding adequate savings levels and thereby induce them to adequately prepare for retirement.

Chapter 3

Promoting Later Planned Retirement: Construal Level Intervention Impact Reverses with Age[3]

ABSTRACT

We predict an age-related reversal of the effect of a construal level intervention on planned retirement age. As individuals' temporal distance to retirement decreases, their primary retirement goal is likely to change. Younger individuals are primarily driven by desirability goals, but older individuals are driven by feasibility goals. Results from an online survey show that indeed a construal level intervention-induced global mindset increases the impact of desirability considerations on planned retirement age for younger individuals (and lowers planned retirement age), but increases the impact of feasibility considerations for older individuals (and raises planned retirement age). The findings underline the importance of taking into account heterogeneity in individuals' chronic construals of decisions when designing construal level interventions to promote later planned retirement ages.

[3] This chapter is based on Van Schie, Dellaert & Donkers (2013, 2015).
Authors' contributions: R. van Schie set up the research design and questionnaires, collected and analysed the data, and drafted the manuscript. B. Dellaert en B. Donkers provided expertise related to the design of the study, interpretation of the results and assisted in (re)writing the manuscript. All authors approved the final manuscript.

3.1 Introduction

In the upcoming decades many countries worldwide are faced with an increase in the percentage of the population of over 65 years old (Economist, 2013; Financial Times, 2013; US Census Bureau, 2012). Hence, a much smaller proportion of the population is expected to be economically active and many individuals will be retired. This trend is likely to cause budget pressures on collective pension funds, public welfare old age provisions, and individuals' own private pension savings (Zaida, 2012). One remedy to lower this effect is to promote later retirement. While later retirement can partly be enforced through policy regulations such as the postponing of old age welfare support, other important strategies involve designing communications to influence individuals' retirement planning (Lusardi & Mitchell, 2007b).

Individuals' planning for retirement requires them to balance how much they believe they can save (a feasibility oriented consideration) and how strong their preference is for retiring earlier (a desirability oriented consideration). Previous research shows that both aspects are important in deciding on one's retirement age but little is understood about what drives the relative importance of the two conflicting aspects in individuals' decision making (Wang & Shultz, 2010).

A type of communication intervention that has successfully been applied to support similar trade-offs between individuals' feasibility and desirability oriented considerations in other domains is that of construal level interventions (Chiou, Wu, & Chang, 2013; White, MacDonnell, & Dahl, 2011). These interventions impact individuals' activation of a global vs. a local mindset, which in turn increases the importance of their primary goals (i.e., goals with a focus on values and principles) compared to their secondary goals (i.e., more practically oriented goals) (Trope & Liberman, 2003, 2010). Not surprisingly, a global mindset is generally found to increase the impact of individuals' desirability goals over their feasibility goals (Danziger, Montal, & Barkan, 2012; Kray & Gonzalez, 1999).

However, most results in psychological research to date have been obtained in conditions where desirability goals are central to the individual's preferences and hence also primary to the decision. Thus, the general finding that higher construal level interventions promote desirability goals may need to be qualified. In particular, there is emerging evidence in the literature that a global mindset shifts attention toward the decision's primary goal, but not necessarily to the desirability oriented goals. Kivetz and Tyler (2007: study 1) show that whether an individual views financially-related or identity-related values as one's guiding principles in life, affects the impact of a construal level activation on the influence of desirability vs. feasibility goals. This suggests that a global processing mode increases the influence of desirability goals only if these goals are

primary to the individual. When feasibility goals are primary, a global mindset may lower the importance of desirability goals to the benefit of feasibility goals. To extend previous research, where high level-features such as desirability (vs. low-level features) have generally been associated with global (vs. local) processing, we therefore propose that the effect of global and local processing on individual's behavior may reverse as a result of stable differences between individuals in terms of the primacy of desirability versus feasibility goals for these individuals.

In the retirement context, individuals who are planning for retirement have to balance having to save for retirement (a feasibility oriented consideration) with how much they like or don't like having to work at an old age (a desirability oriented consideration). Previous research shows that both aspects are important in deciding on one's retirement age, but little is understood about what drives the relative importance of the two conflicting aspects in individuals' decision making (Wang & Shultz, 2010). The finding that younger individuals typically plan to retire earlier than older individuals (Taylor & Shore, 1995) leads us to anticipate that for younger individuals (who are more distant from retirement) desirability oriented retirement goals play a primary role in this decision, whereas for older individuals feasibility retirement goals are primary. This suggests an age related shift in the impact of inducing a global mindset on planned retirement age, which we study in this paper.

3.2 Construal level interventions and individuals' planned retirement age

3.2.1 Construal level interventions: enhancing primary vs. secondary goals

An individual's goal orientation may be affected by environmental cues in the decision-context that create a temporary shift in the decision's mental representation. In particular, external cues can temporarily activate different construal levels (Trope & Liberman, 2003, 2010). Research in Construal Level Theory (CLT) has shown that these differences in construal levels guide individuals' behavior (e.g. Trope, Liberman, & Wakslak, 2007) and, more specifically, can also influence decision-making in the context of retirement planning (e.g. Leiser, Azar, & Hadar, 2008; Lynch & Zauberman, 2007). In particular, construal level interventions may affect individuals' preferences for decision attributes. That is, a construal level intervention that promotes a global mindset (we refer to this as a "global construal level intervention") increases the importance of the individual's primary goals and the corresponding attributes in his or her decisions compared to a construal level intervention that promotes a local mindset (a "local construal level intervention") (Kivetz & Tyler, 2007; Trope & Liberman, 2003, 2010). Often, a

global mindset is found to increase the impact of individuals' desirability goals over their feasibility goals (Danziger et al., 2012; Kray & Gonzalez, 1999).

However, these earlier results have typically been obtained in conditions where desirability goals are inherently more primary to the particular decision than feasibility goals. How these findings extend to situations where feasibility instead of desirability goals are primary to the individual's preferences is less clear. Recent research provides evidence that the relationship between construal level interventions and the importance of feasibility versus desirability goals may differ depending on the decision context. Kivetz and Tyler (2007) found that – under a global but not a local processing mode – individuals who chronically viewed self-respect as more primary to their self-definition preferred desirable identity benefits over pragmatic instrumental ones, whereas those who chronically viewed financial prosperity as more primary to their self-definition preferred pragmatic benefits over identity ones. Hence, before one can assess the likely success of construal level interventions to promote later retirement, it is necessary to understand which decision attributes are primary (vs. secondary) and not which attributes are desirability (vs. feasibility) oriented in a retirement planning context.

3.2.2 Planned retirement age: a tension between desirability and feasibility goals

When individuals set themselves future goals, they often experience a conflict between goals that they would like to achieve (desirability goals) and goals that they think they actually can achieve (feasibility goals) (Achtziger, Martiny, Oettingen, & Gollwitzer, 2012, p. 123; Bargh, Gollwitzer, & Oettingen, 2010, p. 272). In the case of an individual's planned retirement age decision both types of goals are likely to be salient (Taylor & Shore, 1995). Even though most individuals prefer to retire sooner, they often do not expect to be able to afford to retire at their preferred age (Ekerdt, Bossé, & Mogey, 1980; Esser, 2006; Zappalà, Depolo, Fraccaroli, Guglielmi, & Sarchielli, 2008). This suggests that in retirement age planning one's desirable retirement age is generally tempered by financial feasibility concerns. Indeed, a broad range of work-related factors has been found to motivate individuals to retire (early), such as being "tired of working" (Beehr, Glazer, Nielson, & Farmer, 2000), low anticipated attractiveness of future work (Van Dam, Van der Vorst, & Van der Heijden, 2009), low commitment to one's career, and having already attained occupational goals (Adams, 1999). However, also feasibility oriented goals such as being financially secure have been found to predict retirement age (Beehr et al., 2000),

and individuals are more likely to retire earlier if they can afford to do so financially (Wang & Shultz, 2010).

3.2.3 Retirement age goal heterogeneity between younger and older individuals

Besides intervention induced differences in mental representations of a decision, individuals also differ in their chronic mental representation of decisions (Vallacher & Wegner, 1989, p. 669). Individuals tend to have relatively stable mental representations of which decision aspects they consider to be primary (i.e., central to the meaning of the decision) and which aspects are secondary (i.e., less central) for particular decisions. However, what is a primary aspect for one person may be secondary for another (Trope & Liberman, 2010, p. 456). Accordingly, prior research has distinguished between low-level construal individuals, who frame decisions mainly in terms of an action's specific details, and high-level construal individuals, who are mainly concerned about an action's higher level goals and social meanings (Vallacher & Wegner, 1989).

While chronic mental representations are generally stable over time, they may also change over the course of life, especially for important life decisions such as retirement. Systematic age-related changes in chronic goal-orientations have been documented, including shifts from growth toward maintenance and loss-prevention goals as individuals grow older (Freund & Ebner, 2005; Freund, Hennecke, & Riediger, 2010) and shifts in the values and needs that are central to the individual (Rhodes, 1983). Research in CLT has also specifically addressed the effect of a decision's (psychological) distance on goal-orientation (Trope & Liberman, 2003, 2010; Trope et al., 2007). Individuals tend to use higher level construals in their mental representations of decisions when these decisions are more psychologically distant, which shifts the types of decision attributes that are primarily considered (Trope et al., 2007). Therefore we anticipate that in the case of retirement decisions younger individuals are more inclined to represent events in terms of high-level construals than older individuals, because to them retirement is more distant in time.

Accordingly, since distance toward retirement is inherently different for different age cohorts, we also expect a shift in individuals' chronic mental representations of the retirement decision over their lifetimes. In particular, we expect that the primary goals for younger individuals are desirability oriented, because they are temporally distant from the retirement decision. Older individuals, who are temporally closer to retirement, we expect to be relatively more concerned about the feasibility of their decision. Indeed, when younger individuals are relatively more concerned about their desired goal of working or

not at an older age than about the feasibility of being able to pay for their retirement, this would explain why younger individuals generally plan to retire earlier than older individuals.

The notion that younger and older individuals have different mental representations of retirement outcomes and retirement savings is also consistent with the literature on inter-temporal choices and the trade-offs that individuals make between losses and gains. From the individual's standpoint, the amount to be saved (a feasibility-related consideration) can be regarded as a current loss in income that has to be incurred if one wishes to have the long term gain of more time in retirement (a desirability-related orientation). While a broad stream of research has pointed out that individuals typically weigh losses more heavily than gains (e.g. Harinck, Van Dijk, Van Beest, & Mersmann 2007; Leiser et al., 2008; Loewenstein, Read, & Baumeister, 2003; Read, 2004), Eyal et al. (2004) showed that the relative weight of losses versus gains in decision-making can also reverse as a consequence of temporal distance toward the decision. In particular, in making decisions for the near future, individuals weigh cons (such as monetary losses) more heavily than pros (such as leisure gains), but the reverse is true for the distant future. This finding also suggests that older individuals – for whom retirement is closer – will place a relatively higher weight on the loss of retirement income compared to the gain of extra leisure time, than younger individuals.

3.2.4 Hypothesis

Our hypothesis builds on the different roles of intervention induced vs. chronic global (or local) mindsets. Given the existence of differences in primary goals between individuals we predict that an intervention induced global mindset enhances the relative importance of the goal that is primary in the chronically stable mental representation of the decision – independent of whether this primary goal is a desirability goal or a feasibility goal. At the same time an intervention induced local processing mindset enhances the relative influence of the goal that is chronically represented as secondary. In the context of retirement planning, the chronic primacy of desirability versus feasibility goals reverses as the decision to retire comes closer. Therefore, we hypothesize that the impact of a construal level intervention (activating a global vs. local mindset) on the relative importance of feasibility versus desirability retirement goals differs between younger and older individuals.

Typically most individuals have difficulties to increase their monthly savings (Thaler & Benartzi, 2004; Van Schie, Donkers, & Dellaert, 2012) and will be better off in

retirement if they aimed for later planned retirement age. Therefore, we focus on the effect of an intervention that increases the impact of (low) feasibility compared to desirability goals as these interventions should lead individuals to increase their planned retirement age.

Hypothesis 1a: For younger individuals a construal level intervention that induces a *local* mindset increases the impact of financial feasibility of retirement on planned retirement age.
Hypothesis 1b: For older individuals a construal level intervention that induces a *global* mindset increases the impact of financial feasibility of retirement on planned retirement age.

Especially for individuals with a strong dislike of working at an old age but a low financial feasibility to do so, the age-dependent effect of construal level interventions has important implications. While these individuals would like to retire earlier (desirability), they can often not financially afford to do so (feasibility). Hence, these individuals experience a clear conflict when planning their retirement age. For individuals with a low dislike of working there is no such conflict. A low dislike of working already induces them to retire later (which is in line with achieving a sufficient retirement income). Also for individuals who are not limited by financial feasibility, there is no conflict because these individuals have the available financial means that allow them to retire earlier.

Thus, especially for those who experience a strong conflict between their retirement goals, we expect that inducing a global processing mode results in a decision that is more in accordance with their chronic primary concern. In accordance with our hypothesis, we predict that for those who experience this conflict, younger individuals plan to retire later under a local (vs. global) construal level intervention, whereas older individuals plan to retire later under a global (vs. local) construal level intervention. These predictions are tested by examining the effect of construal level activation on the relative importance of feasibility and desirability retirement goals and the resulting planned retirement ages.

3.3 Empirical analysis of the effect of a construal level intervention

3.3.1 Data

We conducted a survey in which participants were randomly assigned to one of two construal level interventions (adopted from Fujita, Trope, Liberman, & Levin-Sagi, 2006). We presented participants with a series of 30 words, such as car, beer, museum, and dog.

In the instructions participants were told that we were seeking their help in understanding what people thought when they encountered these words, so that we could improve their communication effectiveness in various media channels. In the global mindset manipulation, participants were asked to provide a superordinate category for each word whereas in the local mindset manipulation, participants were asked to provide a specific exemplar for each word. Prior research indicates that the cognitive process of superordinate categorization reliably induces a high-level global mindset, whereas the process of subordinate categorization reliably induces a low-level local mindset, even in subsequent unrelated events (Fujita et al., 2006). A pretest on a sample of working employees (working at least 30 hours per week, age 40-60, n = 102) confirmed that the intended shift in mindset occurred and resulted in a significant difference in construal level. This was measured using participants' Behavioral Identification Form (BIF) score (Vallacher & Wegner, 1989). The results showed a significant impact of the construal level manipulation and participants in the high-level construal condition had a significantly higher BIF score than those in the low-level construal condition (M_{high} = .62; M_{low} = .50; $F(1,101) = 7.329$; p = .008).

A total of 306 panel members from a Dutch online research panel qualified for participation in the study. Participants were randomly and equally assigned to each of the two construal level intervention conditions. The following criteria were used for inclusion of participants in the research: Panel members worked as an employee for at least 30 hours per week, participated in an employer pension plan, and were aged between 40 and 60. In addition, respondents were excluded from the analysis when their responses revealed that they had not taken the task seriously[4], that they had filled out the survey more than once, or that they were not the intended addressee of the survey. In the analysis, respondents were divided in two groups based on a median split, one of younger (age 40-50, n = 142) and one of older respondents (age 51-60, n = 164).

To support that the two age groups actually see retirement as being temporally closer (farther), we asked 122 working employees (aged 40-60) to rate three statements regarding their view on retirement on a 7-point scale from 1 (strongly disagree) to 7 (strongly agree). Younger respondents (age 40-50) differed significantly from older respondents (age 51-60) on all three statements: "I think a great deal about life in

[4] In particular, we excluded respondents who answered statements and trade-off questions faster than two standard deviations below the mean log completion time, who gave the exact same answer on 29 statements, who did not complete the construal intervention task successfully, who took more than 5 minutes to only fill in the survey's dependent variable after having finished the construal level intervention task, whose answers to an open ended question on their retirement age revealed that they had not understood the question correctly, and who indicated they planned to retire unrealistically early or late (i.e., more than 14 years before or later than 14 years after the state pension age).

retirement" (M_{young} = 3.13; M_{old} = 3.80; $F(1,121)$ = 4.790; p = .031), "I have a clear vision of what life in retirement will be like" (M_{young} = 4.13; M_{old} = 4.73; $F(1,121)$ = 4.270; p = .041), and "I know what I want to do in retirement" (M_{young} = 4.60; M_{old} = 5.21; $F(1,121)$ = 5.292; p = .023).

3.3.2 Variables

Planned retirement age – To capture an individual's retirement plans, we used the difference between the individual's planned retirement age and the expected state pension age. This allowed us to correct for respondents' anticipated changes in the state pension regulations as driver of their planned retirement age. A positive value on our composite scale implies that a respondent plans to work beyond the expected official state pension age, whereas a negative value implies that the respondent plans to retire before being entitled to the state pension.

Financial feasibility – One's ability to save more for retirement is the key driver of the financial feasibility of early retirement. To measure this saving ability we used two items scored on a seven-point scale ranging from "strongly disagree" to "strongly agree": "I am able to adjust my expenses so that I can save more for my retirement" and "My income is sufficient to save extra for my retirement". The measurement turned out to be reliable (Cronbach alpha = .90).

Desire to stop working – We measure desire to stop working inversely by asking individuals about their anticipated attitude toward work near retirement. This is a commonly used measure in the literature and we adopted a measure of expected work attitude with three items on a seven-point scale ranging from "strongly disagree" to "strongly agree", from the retirement attitude scale of Atchley and Robinson (1982): "I expect to be (highly) satisfied with my work in the last few years before my retirement", "I expect to enjoy my work a lot in the last few years before my retirement", "I expect my work to be worthy to me in the last few years before my retirement". For interpretation, we reverse-coded this scale (Cronbach alpha = .97) so that a higher score indicates that it is desirable to the individual to retire sooner.

Control variables – We included gender, years of education, partner (yes or no), difference with partner's age, perceived health, main wage earner (yes or no), level of monthly household income, a dummy for missing values on income, a variable to measure how well a respondent can manage on household income and a variable to measure external constraints that lead people to retire earlier as control variables in the model (see Appendix B for measurement).

3.3.3 Model

To study the relationships between an individual's current age, feasibility of early retirement, construal level intervention and planned retirement age, we used an ordered probit model. The main reason for doing this is that our dependent variable of Planned Retirement Age can best be analyzed as ordinal in this study. Individuals tend to have a strong preference to stick to the status quo and the default option (Kahneman, Knetsch, & Thaler, 1991; Thaler & Sunstein, 2003), which is also the case for retirement decisions (Madrian & Shea, 2001). Therefore, a deviation with one year from the official state pension age is likely to loom much larger than an incremental deviation with one year from, for example, two to three years before the official state pension age. In addition, the ordered probit model allows us to easily include control variables in the model when estimating the impact of the focal effects from our hypothesis.

3.3.4 Results

We hypothesized that the impact of the construal level manipulation on the influence of the two types of decision aspects is different between the two age groups. This is captured in a three-way interaction effect between the construal level intervention (global vs. local), the decision aspect (financial feasibility or desire to stop working) and age on planned retirement age. Table 3.1 presents the estimation results for the ordered probit model with an individual's planned retirement age as dependent variable. Both three-way interaction effects are significant and show opposite signs as hypothesized. First, for financial feasibility we find a positive three-way interaction (β = .485; p < .01), which shows that it received more [less] weight for older [younger] individuals under a global mindset. In contrast, for desire to stop working we find a negative three-way interaction (β = –.465; p < .01), which indicates that this aspect received less [more] weight for older [younger] individuals under a global mindset[5]. These effects provide support for H1.

[5] In this chapter we considered individuals above 40 years old, because in general only older individuals actively consider their future retirement situations. Yet, we also have data available for younger individuals aged 25 to 39 ($n_{\text{global prime}}$ = 54; $n_{\text{local prime}}$ = 67) and we conducted a similar analysis for this age cohort. We only find a significant negative interaction effect of a Global (vs. concrete) prime with Desire to stop working on Planned retirement age, but no significant interaction effect with Financial feasibility. There can be several reasons for the finding that a prime only affects the impact of desirability goals for individuals under 40 years old. First, for these individuals financial feasibility might not yet be a salient retirement goal when they consider their retirement, or this goal may be too vague or uncertain to be part of their mental representation in terms of primary and secondary goals. Second, we measure feasibility in this study as one's ability to save more for retirement. It might be that young individuals do not yet relate their savings ability to the feasibility goal of retiring earlier.

To further enhance interpretation, the three-way interaction effect is graphically illustrated in Figure 3.1 for financial feasibility[6]. This is the most relevant effect from a policy point of view because a greater impact of financial feasibility in the decision will lead to financially more healthy retirement plans. To create this graph we calculated the planned retirement age relative to expected state pension age using the estimated probit model for all (eight) combinations of age (younger vs. older individuals), construal level intervention (global vs. local), and financial feasibility evaluated at the 20th and 80th percentiles of the distribution (2 vs. 5 on a 7-point scale, respectively). All other variables, including the desire to stop working, were held constant at the sample average. The figure shows that as expected, for younger individuals, lack of financial feasibility has a positive effect on planned retirement age only under a local mindset manipulation. For older individuals, in contrast, lack of financial feasibility has a positive effect on planned retirement age under a global construal level intervention.

Table 3.1: Estimation results ordered probit model

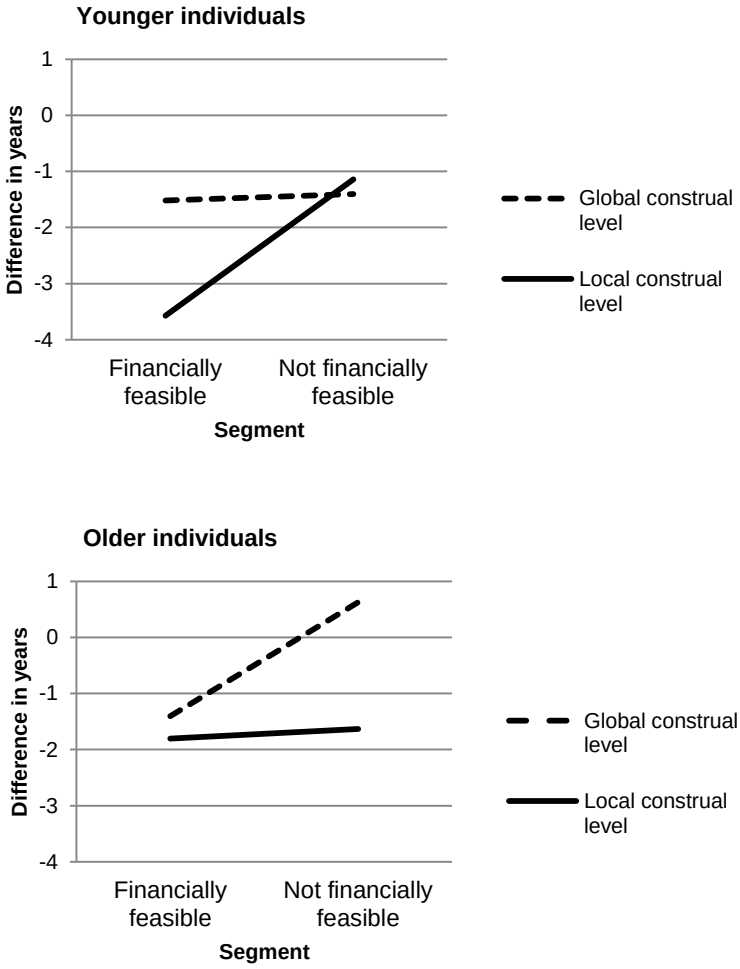
	Planned retirement age[a]			
	β		St. error	*p*
Age (Younger vs. Older)	.034		.745	.964
Construal Level Intervention (Global vs. Local Mindset)	.671		.658	.308
Dummy Global * Dummy Younger	-.196		.969	.840
Financial feasibility	-.019		.076	.808
Financial feasibility * Dummy Younger	-.263	*	.115	.022
Financial feasibility * Dummy Global	-.216	*	.101	.032
Financial feasibility * Dummy Younger * Dummy Global	.485	*	.158	.002
Desire to stop (sooner)	-.190		.104	.068
Desire to stop * Dummy Younger	.187		.130	.152
Desire to stop * Dummy Global	.153		.129	.238
Desire to stop * Dummy Younger * Dummy Global	-.465	*	.175	.008
Control variables				
Gender (0 = male, 1 = female)	.029		.139	.832
Education	-.054		.036	.137
Partner (0 = no, 1 = yes)	-.209		.159	.190
Age – age partner	.007		.009	.466
Health	-.142		.095	.135
Main wage earner (0 = no, 1 = yes)	.085		.211	.686
Income	.118		.098	.229
Income missing	.426		.353	.227
Manage on current income	-.007		.085	.934
External constraint	-.081		.048	.089
No. of observations	306			
Pseudo R-square (Cox and Snell)	.207			

* Significant at $p < .05$ level.

[a] Planned age relative to anticipated state pension age.

[6] Appendix C shows this figure for desire to stop working.

Figure 3.1: Predicted planned retirement age relative to expected state pension age: Illustration of the probit model's three-way interaction effect for financial feasibility



Note: The y-axis shows the difference between the planned retirement age and expected state pension age. A positive value implies that the respondent plans to retire after the expected state pension age, whereas a negative value implies that he or she plans to retire before the state pension age.

To investigate the policy relevance of our results we examined whether there are significant differences in early retirement plans under a global versus a local mindset for individuals with a strong desire to stop working, but who cannot afford to do so. This is the group of individuals that is most relevant for a policy intervention because they can potentially be persuaded to change their retirement plans and retire later. We study the model's predictions by comparing the predicted retirement ages only for individuals who have a strong desire to stop working (the 80^{th} percentile of the distribution) and also experience difficulty in saving more for early retirement (the 20^{th} percentile of financial feasibility). These percentages were selected to reflect relatively high but not extremely high scores on the underlying variables, which reflects a relevant target group for possible policy interventions. Using the estimated probit model, predicted planned retirement ages were calculated for each construal level intervention for both young and old individuals (four combinations). In this calculation, the variables for desire to stop working and financial feasibility were held constant at the 80^{th} and 20^{th} percentile, respectively. All other variables were held constant at the sample average. The results show that younger individuals who have a strong desire to stop working but for whom such a decision is not affordable indeed plan to retire later under a local processing mindset (Planned retirement age relative to state pension age is –1.14 (local) vs. –2.73 (global); $p = .052$). In contrast, for older individuals a global processing mindset increases their planned retirement age (Planned retirement age relative to state pension age is 0.48 (global) vs. –2.41 (local); $p < .01$).

3.4 Conclusion and discussion

We find that the influence of construal level interventions (i.e., activating a global vs. local mindset) on the relative importance of desirability versus feasibility is affected by the temporal distance toward retirement, i.e. the individual's age. Global processing increases the impact of desirability retirement goals relative to feasibility goals for younger individuals, while it has the opposite effect for older individuals.

For research on CLT, our results are important because they show that in planning-contexts, such as those for retirement age, the chronic temporal distance toward the decision changes the primacy of feasibility (versus desirability) goals, and hence the aspect that receives more weight under a global (vs. local) mindset. We conclude that an individual's chronic construal level (determined by among others age) determines the stable mental representation of the decision in terms of primary and secondary goals. Construal level intervention induced changes in construal level will then highlight different

elements within this mental representation, depending on the primary and secondary goals that are present within the (pre-existing) mental representation. This insight may provide an overarching framework for previous studies that reported that the consequences of global (vs. local) processing should be considered in relation to an individual's values and personality traits, such as what values are central for the individual (Kivetz & Tyler, 2007; Verplanken & Holland, 2002) or an individual's natural tendency to focus on either promotion- or prevention related concerns (Lee, Keller, & Sternthal, 2010).

This framework has immediate consequences for the effectiveness of construal level interventions aimed at solving self-control conflicts (Fujita & Han, 2009; Fujita & Roberts, 2010; Fujita et al., 2006). While research in this domain has found that global processing generally induces individuals to choose the option that is beneficial in the long-term, our results show that this is not always the case. In particular, when individuals face a tradeoff between desirability goals with consequences for the relative short-term and feasibility goals with consequences for the relative long-term, as is the case for the retirement-age decision, an individual's chronic temporal distance determines which goals are primary to the decision and hence also which decision attributes will become more influential under a global mindset. This idea is in line with the "self-control dilemma", which is defined as a situation in which "the optimal choice is not transparent and indulgence is inherently valuable and not dominated by the farsighted option" (Keinan & Kivetz, 2008, p. 688). In all these situations, a higher construal level could as well shift attention to the more "indulging" attribute with its short-term benefits.

From a policy point of view, this study has important implications for financial firms wishing to support individuals' financial decisions. Our results show that the optimal construal level intervention to promote later retirement differs between younger and older individuals, especially for those who would like to retire early but who cannot afford to do so. In particular, for younger individuals a global processing mode stimulates them to resolve their decision conflict with an emphasis on their (primary) desirability concern, i.e., the desire to stop working, resulting in an earlier planned retirement age compared to local processing, which focuses on feasibility and the corresponding need to work longer. For older individuals, in contrast, global processing promotes resolving the decision conflict in accordance with their (primary) feasibility goals (i.e., a focus on financial feasibility), resulting in a later planned retirement age compared to local processing (where the desire to stop working dominates the decision). As more of the information search process for pension decisions is taking place online, attention should also go to the design of online information portals. For example, the mood induced by a pension website could

induce specific mindsets (Gasper & Clore, 2002) and promote different processing modes which affect the retirement planning of visitors.

Finally, while in this research we used an unrelated construal level intervention task (categories vs. exemplars), it would be worthwhile to investigate what results can be obtained with real life communication interventions, either in personal meetings or online, that promote a global (vs. local) mindset. For example by asking individuals to visualize their decision from a third-person rather than a first-person perspective (Pronin & Ross, 2006; Trope & Liberman, 2010, p. 447). Thus, we hope that our study stimulates the further use of the heterogeneity in primary vs. secondary goals between individuals to tailor construal level interventions to promote beneficial (financial) planning behavior by individuals, such as planning for a feasible retirement age.

Chapter 4

Saving More or Retiring Later? A Study into the Determinants of Retirement Planning Heterogeneity[7]

ABSTRACT

Many individuals do not contribute sufficiently towards their pension savings to support an income at their planned retirement age that provides their desired standard of living. There are two main strategies that they can follow to overcome this gap: They can increase their savings or plan to retire later. While most previous research has investigated individuals' intentions to use one of these strategies separately, in this study we investigate how intentions to follow each strategy may be interrelated. In particular, we propose that lower perceived savings adequacy will increase individuals' savings intentions, but that depending on the level of individuals' perceived current income constraints they either form stronger intentions to save more (if they perceive weak income constraints) or to retire later (if they perceive strong constraints). Results from an online survey amongst 1472 working individuals in the Netherlands provide support for the predicted effects. We also analyze in greater detail the retirement plans of two groups in our sample that are at risk of not saving enough for retirement. They are individuals who are currently not working and individuals who do not participate in a pension plan respectively. The more detailed findings for these groups reveal different responses to an anticipated lack of pension savings, in line with our hypothesized relations. This underlines the importance of taking into account the heterogeneity in individuals' financial conditions for understanding and supporting retirement planning decisions. We discuss implications of our findings for designing communications that aim to improve individuals' retirement planning.

[7] This chapter is based on Van Schie, Dellaert & Donkers (2016).
Authors' contributions: R. van Schie set up the research design and questionnaire, collected and analysed the data, and drafted the manuscript. B. Dellaert en B. Donkers provided expertise related to the design of the study, interpretation of the results and assisted in (re)writing the manuscript. All authors approved the final manuscript.

4.1 Introduction

Recent pension prognoses in the US show that about half of the working population is at risk of not saving enough to maintain their standard of living once they retire (Munnell, Webb, & Hou, 2014). Similar projections have been made for other countries such as the Netherlands (Knoef et al., 2016). To remedy a projected drop in income after retirement individuals can increase their current pension savings. However, as an alternative strategy they can also plan to retire later, which allows them to build up their pension savings for a longer period of time. Policy makers have also recognized the importance of this second approach to increasing retirement income, and in the past years many governments have implemented policies with the purpose of promoting later retirement by making it financially less attractive to retire early (Bloomberg Business, 2010; OECD, 2006, p. 94). Thus, planning to retire later is increasingly becoming an important alternative strategy towards obtaining a higher retirement income (Bloomberg Business, 2014).

Behaviorally, it is well known that individuals who are saving inadequately for retirement rarely adjust their savings levels to increase their projected retirement income (e.g., Choi, Laibson, Madrian, & Metrick, 2002). This can be explained in part by the fact that individuals don't actively think about their retirement (Lusardi & Mitchell, 2007a), and that they tend to postpone the necessary actions to adjust their savings (Thaler & Benartzi, 2004). In this paper we propose that an additional explanation can be that individuals plan to retire later as an alternative strategy to overcome their inadequate savings level. Little research to date has investigated to what extent individuals utilize the different strategies of saving more versus retiring later in their planning for an adequate income level at retirement. The objective of this study is to investigate whether individuals take advantage of both strategies and, if so, how their use of these strategies may be related.

Previous research typically focused on single retirement planning strategies to overcome inadequate retirement savings. For example, with respect to savings intentions, Choi et al. (2002) found that many individuals who were aware of saving too little increased their savings intentions (though only a small percentage actually started saving more). Van Schie, Donkers and Dellaert (2012) found that individuals' savings intentions depend on pension income uncertainty as well as their current financial situation, and Wiener and Doescher (2008) provide a framework suggesting that individuals' concerns about low levels of retirement income only have a positive effect on starting to save more when they believe they have the ability to save more. Other studies have investigated

individuals' intentions of retiring earlier versus later and find a significant negative effect of greater financial preparedness on planned retirement age (Adams, 1999; Montalto, Yuh, & Hanna, 2000). However, Taylor and Shore (1995) found that surprisingly individuals' beliefs of being financially uncomfortable in retirement did not affect their planned retirement age.

In the current paper we address both individuals' savings intentions and their intentions to retire later. In line with previous research, we predict that lower perceived savings adequacy will increase individuals' savings intentions. However, we predict that depending on individuals' perceived income constraints they either form stronger intentions to save more (if they perceive weak income constraints) or to retire later (if they perceive strong income constraints). This prediction represents a cross-over between recent findings in the area of savings intentions (Van Schie, Donkers, & Dellaert, 2012; Wiener & Doescher, 2008) and retirement age planning (Taylor & Shore, 1995). We test the proposed effects in an online survey amongst 1472 working individuals in the Netherlands.

4.2 Theory

4.2.1 Saving more as a strategy to overcome inadequate retirement income

In most countries around the world, a substantial number of individuals is at risk of not saving enough to retire comfortably (e.g., Kim, Hanna, & Chen, 2014; Helman, 2015). In the US for example, about 40 percent of workers is not confident in their ability to retire comfortably (Helman, 2015). Similarly in the Netherlands, more than 25% of Dutch workers are worried they are not saving enough to maintain their standard of living in retirement (Wijzer in Geldzaken, 2014). As a result, communicating to individuals that they should increase their savings has been proposed as strategy to promote the accumulation of adequate levels of retirement income (Wiener & Doescher, 2008).

Previous research has linked socio-demographic and psychological characteristics to various retirement planning activities and outcomes, such as total accumulated retirement wealth (Lusardi & Mitchell, 2007a), how much an individual thinks about retirement (Van Rooij, Lusardi, & Alessie, 2011), current savings contributions (Hershey, Henkens, & van Dalen, 2007) and contribution rates in the last 12 months (Stawski, Hershey, & Jacobs-Lawson, 2007). While these studies show that certain individuals or groups of individuals are not preparing optimally for their retirement, they leave open the question of how and whether individuals who know that their current saving behavior is suboptimal plan to respond to this perceived lack of pension savings.

Several studies have investigated individuals' intentions to save (more) for retirement (Croy, Gerrans, & Speelman, 2010a, 2010b; Davis & Hustvedt, 2012; Wiener & Doescher, 2008, p. 138), but only few studies have so far addressed the relation between savings intentions or behavior and perceived savings adequacy. Choi et al. (2002) found that while two-thirds of working employees knew that they were not saving enough, only a small fraction of employees actually increased their savings contributions in the next few months. Van Schie et al. (2012) showed that low perceived savings adequacy has a positive effect on intentions to start saving more, but only when individuals are sufficiently certain about the inadequacy of their retirement savings and also have the financial ability to save.

4.2.2 Retiring later as a strategy to overcome inadequate retirement income

Another strategy for individuals to deal with inadequate retirement savings is to continue working for longer, retire later and hence contribute more towards their retirement savings and commence the depletion of their retirement savings at a later point in time. Individuals can for example choose to continue to work in their career employment (e.g., Feldman, 1994), or to engage in alternative employment that bridges between their regular career and retirement (e.g., Kim & Feldman, 2000; Wang, Zhan, Liu, & Shultz, 2008). Most previous research on individuals' retirement age planning has shown that financial concerns may withhold individuals from retiring earlier (Wang & Shi, 2014). Individuals with fewer accumulated financial resources and lower perceptions of the adequacy of these resources are less likely to retire (Gruber & Wise, 1999).

In line with this finding, retirement decisions are found to be heavily influenced by financial incentives (Euwals, Van Vuuren, & Wolthoff, 2010). It is interesting to note that individuals often retire as soon as they become eligible for (early) retirement benefits (Kapteyn & De Vos, 1999), which assures them of a secure level of income after retiring. Previous research suggests that individuals generally like to retire earlier, but often lack the financial resources to do so. For example, Ekerdt et al. (1980) found that US male workers generally preferred to retire sooner than they were planning on doing, indicating that their preferred retirement ages were tempered by financial concerns. Also across a number of European countries, many workers were found to ideally like to retire earlier than they expected to be able financially (Esser, 2006).

Interestingly, not all previous research found significant (positive) effects of individuals' lower perceived savings adequacy on planned retirement age (Taylor & Shore, 1995; Van Dam, Van der Vorst, & Van der Heijden, 2009). Taylor and Shore (1995)

suggest that this can occur because finances become important only as soon as one gets closer to retirement. This explanation is supported by the finding of Van Schie, Dellaert and Donkers (2015) that financial feasibility only becomes a primary concern to individuals as they approach their retirement age.

4.2.3 Joint planning for how much to save and when to retire

From previous research to date it is not clear yet how individuals jointly plan to increase their pension savings and/or to increase their pension retirement age (or not). In particular, little is known about whether individuals who perceive their pension savings to be inadequate and who do not plan for additional savings adjust their planned retirement age instead. Similarly, it is not clear if perhaps individuals who do not plan to retire later in response to inadequate savings are planning to increase their savings instead.

Studies taking into account both individuals' intentions to save more and to retire later are scarce. In research on retirement savings adequacy, the interplay between retirement age and savings is only taken into account indirectly (e.g., Mitchell & Moore, 1998; Skinner, 2007; Yuh, Montalto, & Hanna, 1998), meaning that the amount one needs to save, and thus whether current savings are adequate or not, is conditional on the expected or presumed retirement age. For example, Mitchell and Moore (1998) explore how much individuals need to save extra to retire comfortably when they would retire either at the age of sixty-two or sixty-five. Yuh, Montalto and Hanna (1998) analyzed if individuals have adequate wealth for retirement at their planned retirement age and showed that those with a higher planned retirement age were more likely to have adequate retirement wealth. However, these studies did not address whether individuals intend to save more or retire later in response to their perception of having a retirement savings gap.

When we look at the relation between individuals' intentions to increase their pension savings and their intentions to increase their pension retirement age in response to an anticipated gap in their retirement income (i.e., inadequate retirement savings), we predict that they prefer to solve this problem by saving more rather than by postponing their retirement date. Indeed, while workers' willingness to work longer has slowly increased in the last decade, the overall willingness to work longer is still low (Cuelenaere & Chotkowski, 2008). Therefore we predict that individuals' strategy to retire later is subordinate to a strategy of saving more. This implies that we hypothesize an effect of greater perceived inadequacy in retirement savings on savings intentions but not on intentions to retire later.

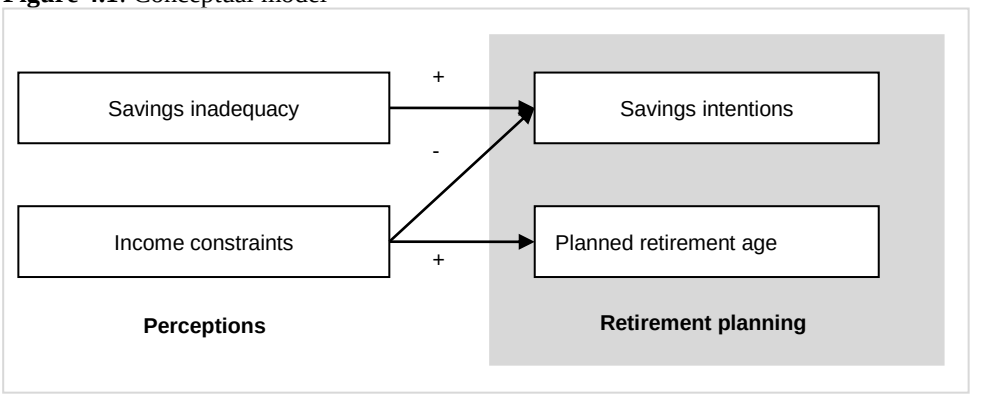
Hypothesis 1: Greater perceived inadequacy of retirement savings increases individuals' intentions to save more for retirement.

However, we also propose that an individual's current financial situation is likely to be an important factor in deciding between either planning to save more or retire later. Van Schie et al. (2012) found that individuals only intend to save more when they are financially capable to do so. Likewise, an individual's concerns about low levels of retirement income or an individual's perceived benefits associated with increasing one's saving level only have a positive effect on the likelihood that a person will start saving more when that person thinks that he or she has the ability to save more (e.g., Ajzen, 1991, 2002; Wiener & Doescher, 2008). We extend this line of reasoning to predict that when individuals face strong income constraints, they will lower their intention to save more for retirement. However, if these individuals do want to improve their pension income, they will have to look for other ways to safeguard an adequate retirement income[8]. Hence we hypothesize that individuals who perceive strong income constraints instead will be more likely to plan for a later retirement age (Figure 4.1 summarizes the hypothesized relations).

Hypothesis 2a: Stronger perceived income constraints increase individuals' planned retirement age.
Hypothesis 2b: Stronger perceived income constraints decrease individuals' intentions to save more for retirement.

[8] We thank an anonymous reviewer for suggesting an additional explanation. That is, individuals who have a very low income for an extended period of time (e.g., those who are unemployed or disabled), may have a lower desire to increase their retirement savings, because they have already adjusted to a low income level. For such individuals, the decision to retire is not very important, as not much will change, and their planned retirement age will shift towards the state pension age.

Figure 4.1: Conceptual model



4.3 The impact of perceived savings inadequacy and income constraints on retirement planning

4.3.1 The retirement situation in The Netherlands

Because we use a Dutch sample to study how individuals' perceptions of their retirement savings adequacy and income constraints affect their planned retirement behavior, we first provide a short description of the pension system in The Netherlands. The Dutch system is well-known for its broad coverage; in addition to a pay-as-you-go state pension scheme, for which workers are eligible to receive monthly payments after they reach the eligible age, more than 95% of the employed population is covered by quasi-mandatory occupational pension plans (Ministry of Social Affairs and Employment, 2009). Still, a substantial group of workers is at risk of saving inadequately (Wijzer in Geldzaken, 2014), for example because they accumulated less pension benefits due to periods of part-time work, periods of unemployment, or not being entitled to an occupational pension plan.

Like in many other countries, the Dutch pension system is undergoing some changes. Traditionally, the state pension age was set at 65, and many individuals chose to retire earlier (e.g., average retirement age in 2000 was 62; Statistics Netherlands, 2014). Most individuals' retirement income consists of a combination of state pension and an employer-based pension (Knoef, Goudswaard, Been, & Caminada, 2015).

In the last decade the Dutch government has taken measures to make early retirement financially less attractive (e.g., Euwals, Van Vuuren, & Wolthoff, 2010; Van Oorschot, 2007) and it was decided to increase the official state pension age gradually from 65 to 67 in 2021, after which it will be further increased based on the average life

expectancy (The Actuary, 2014; Economist, 2014). These reforms have made early retirement more expensive for workers. First, because they will only be provided with state pension after reaching the official pension age, which for many workers is the biggest part of their pension income (Ministry of Social Affairs and Employment, 2009). Second, because workers' occupational pensions are decreased for every year that they begin drawing on their pensions earlier. The reason is that by retiring earlier they contribute fewer years to their pension plans, which lowers their total pension capital, and in addition the pension plans need to pay out the accumulated resources over more years, which lowers the possible payment per year for a given pension capital. If, on the other hand, workers decide to retire later, their pensions are raised (up to a certain legal maximum) for every year they retire later. While employees are gradually adjusting to these changes, on average they would prefer to continue working only till the age of 63.9 (GfK, 2015), which suggests that they may face some difficult trade-offs between saving more for retirement or retiring later, if they want to obtain a sufficient retirement income.

4.3.2 Method

Sample

A total of 1472 panel members from a Dutch online research panel qualified for participation in the study. The following criteria were used for inclusion in the research: Respondents were selected who were between ages 25 and 65, who were the main wage earner and who were working as an employee, unemployed or (partly) disabled. A total of 1599 respondents met these criteria and completed the survey[9]. Further, we only included respondents who knew whether they were participating in an employer pension plan or not, and who reported to plan to retire no earlier than 14 years before and no later than 14 years after the state pension age (n = 1528) and that took the survey task seriously (n = 1472)[10]. The average age of the respondents was 48 years, 62 percent are males, 62 percent have a partner and the median net household income is between 2000 and 3000 euro per month (see Appendix D for details). These numbers are in line with the target population of our study.

[9] Completion rate is 89%.

[10] Exclusion criteria for not taking the survey task seriously were as follows. We excluded those respondents who gave the same answer for 23 statements, those who were likely to have filled it in twice (i.e., same user ID has more than one completed survey, same user ID opened another version of the survey before completing this version, or users with same IP address in combination with the same age and gender), those who answered the questionnaire in less than 5 minutes, and those who did not complete the survey.

Dependent variables

Savings intention – Individuals were asked the next question on a seven-point scale, ranging from 'certainly not' to 'certainly': "In the next 12 months, do you expect to make extra contributions in order to supplement your income after retirement?"

Planned retirement age – To measure an individuals' planned retirement age, we adopted two questions from Van Schie et al. (2015) to gauge the difference between participants' planned retirement age and the age at which they expected to become eligible for state pension. We measured planned retirement age using the following two-digit open-ended question: "Considering that you now have to indicate at what age you will retire, what age would that be?" To measure expected state pension (known as AOW in Dutch) age, respondents answered the following two-digit open-ended question: "At what age do you expect to begin receiving AOW?" We formed a composite planned retirement age scale, by subtracting the respondent's expected state pension age from the respondent's planned retirement age, to correct for (anticipated) changing state pension regulations as driver for later retirement in this study. A positive value on our composite scale implies that a respondent believes to work beyond the official state pension age.

Independent variables

Perceived savings inadequacy – Perceived savings inadequacy was measured (after reverse coding) using a five-point scale ranging from 'totally inadequate' to 'totally adequate' (adopted from Van Schie et al., 2012): "Based on how you expect to live in retirement and given that you do not adjust your current saving behavior, do you expect to have adequate financial resources to retire comfortably?"

Perceived income constraints – Perceived income constraints was measured (after reverse coding) using the following question "When you think of the next 12 months, how well you think you can get by on the total income of your household?" with answers on a five-point scale ranging from 'it is very hard' to 'it is very easy'.

4.3.3 Results: Hypothesis tests

On average, respondents in our sample plan to retire at the age of 64.2, which is 1.7 years before the age at which they expect their state pension to commence, and the average strength of their additional savings intention is 2.5 (on a 7-point scale from 1 'certainly not' to 7 'certainly'). In total, 191 respondents (13 percent) think it is 'hard' or 'very hard' to get by on their income in the next 12 months, and 534 respondents (36 percent) expect their financial resources for retirement to be a bit or totally inadequate.

To verify the hypothesized relationships (see Figure 4.1), we estimated two ordered probit models (see Table 4.1).[11] In the first model we test H1 and H2b, the effects of respondent's perceptions of savings inadequacy and income constraints on their additional savings intentions. In the second model we test H2a, the effect of perceived income constraints on planned retirement age. We also control for the effect of perceived savings inadequacy in this second model. The reason for using ordered probit models is that our dependent variables are ordinal in nature. This not only applies for the answer scale used for savings intentions, but also for planned retirement age because a deviation with one year from the official state pension age is likely to loom much larger to individuals than further incremental extra years. We included gender, age and partner (yes vs. no) as control variables in the model estimation[12].

Table 4.1: The effects of perceptions on retirement planning §

Dependent variable	Retirement planning			
	Savings intention		Planned retirement age	
	β	*p*	*β*	*p*
Perceptions				
Savings inadequacy	.200 **	.000	.029	.297
Income constraints	-.109 **	.001	.100 **	.002
Controls				
Age	.003	.289	.014 **	.000
Partner	-.025	.695	-.075	.221
Gender	-.049	.453	-.061	.331
No. of observations	1472		1472	
Pseudo R-square (Cox and Snell)	.032		.028	

§ Ordered probit model estimates.
** $p < .01$; * $p < .05$.

We find strong support for our hypotheses. First, for H1 we find that, as predicted, greater perceived savings inadequacy increases one's savings intention ($\beta = .200$; $p < .01$). The hypothesized effects of perceived current income constraints are also as expected. In

[11] In the survey, respondents who filled in the questionnaire were randomly assigned to one of three conditions. Respondents in two conditions received a priming task that asked them to explain why or how a person would engage in six particular activities; the other group did not receive this task. In our analyses (table 4.1 and 4.2) we combined responses across all conditions and controlled for the main effect of condition by including a dummy variable for each group. These dummies had no significant impact on the dependent variables in the analyses and there was no significant interaction of condition with the effect of the two perceptions.
[12] We also tested for the effect of including age and income as further control variables and found that this did not change the significance of the results.

support of H2a and H2b we find that stronger perceived current income constraints significantly reduce individuals' savings intentions (β = -.109; p < .01) and increase their planned retirement age (β = .100; p < .01). We find no effect of perceived savings inadequacy on planned retirement age (n.s.).

Since the reported coefficients of the ordered probit models are somewhat difficult to interpret, we facilitate interpretation by computing the average effect of a one unit change in the latent variable on the predicted value of the dependent variable. For savings intention, we find that a unit change in the latent variable of the ordered probit model corresponds to a 1.55 point shift in the savings intention scale. This means that the β coefficient of .200 for the effect of perceived savings inadequacy implies a 0.310 item scale point shift in savings intentions per unit change (item scale point) in the independent variable, and that the β coefficient of -.109 for perceived current income constraints implies a -0.169 item scale point shift in savings intentions per unit change (item scale point) in the independent variable. For planned retirement age, we find that a unit change in the latent variable of the ordered probit model corresponds to a 1.35 year shift in the planned retirement age. Hence, the β coefficient of .100 for the effect of perceived current income constraints on planned retirement age implies a 0.135 year (or 1.62 months) shift in retirement age per unit change (item scale point) in the independent variable.

4.3.4 Illustrative implications for two vulnerable groups

In this section we investigate if two different groups who are at risk of saving inadequately, do indeed follow different hypothesized planning strategies depending on their financial situation. By doing so, we deepen our understanding of the drivers of individuals' perceptions of savings adequacy and current income constraints, and illustrate the practical relevance of our hypotheses for objectively verifiable vulnerable groups in our sample. We focus on two groups of individuals who are highly at risk of preparing inadequately for their retirement and who differ in terms of their current financial situations. The first group consists of individuals who are involuntarily not working, due to the fact that they are currently unemployed or disabled. We expect that individuals in this group face strong current income constraints and are currently not financially able to save more but plan on retiring later (in line with H2a and H2b). Wiener & Doescher (2008) argue that individuals' concerns about retirement income only have a positive effect on the likelihood they will start saving more when they have the ability to do so and Van Schie et al. (2012) find that individuals indeed only intend to save more when they are financially capable to do so. More specifically to this group of interest, Knoef et al. (2016) show that

individuals who faced disability or unemployment for at least two years have relatively lower annuities from pensions and are more likely to reach retirement with insufficient replacement rates. The second group that we study are individuals who are employed but not covered by an occupational pension plan. These individuals, who represent a small, but growing subgroup of all Dutch employees, are responsible for their own retirement savings and are more likely to save inadequately for their retirement (Helman, 2015). They do have a job and hence (in line with H1) are likely to be able to save more for retirement.

As a starting point for this analysis we investigate whether these groups, which can be regarded as likely to be objectively different from the general population in terms of accumulating inadequate retirement resources, are also (subjectively) aware of a potential retirement savings gap. Then we test whether they apply different strategies in line with the predicted effects in H1, H2a and H2b to secure an adequate level of retirement income. We expect that both groups believe that they are saving inadequately and that when perceived income constraints are weak (i.e., the second group that works but with no pension plan), the perception of saving inadequately is a significant predictor of retirement savings intentions (H1). In contrast, when perceived income constraints are strong (i.e. the first group that is currently not working), we expect that individuals plan to postpone their retirement age (H2a and H2b). Studying these two different vulnerable groups highlights differences in perceptions and the hypothesized retirement planning behavior across individuals, and provides insights to what extent perceptions are mediating their retirement planning behavior.

The effects of currently not working or not participating in a pension plan

We used the following measures in our data to classify the two vulnerable groups in our sample:

Currently not working – In the questionnaire, respondents who are not employed were asked an open-ended question about what their main occupation is. Based on these open answers, we coded the respondents that were unemployed or (partly) disabled with a dummy variable for our analysis. Thus, we obtained a dummy variable indicating whether individuals are currently unemployed or disabled (vs. employed).

No pension plan participation – Respondents answered the following question: "Does your current job entitle you to a retirement income (apart from the state pension)? (yes/no)" Respondents who replied "no" to this question were coded with a dummy variable.

Based on these variables 47 respondents in our sample were classified as currently not working (unemployed/disabled) and 72 respondents as not participating in an employer

pension plan[13]. We find that as expected both groups have higher perceived inadequacy of their pension savings than the mean of the total sample (mean total sample = 3.07, SD = 1.11; mean no pension plan group = 3.67, SD = 1.21; mean currently not working group = 3.51, SD = 1.21). Of the two groups, only the group that is currently not working experiences stronger perceived income constraints (mean total sample = 2.50, SD = 0.95; mean no pension plan group = 2.87, SD = 1.17; mean currently not working group = 3.62, SD = 1.07).

We first estimated ordered probit models to study the direct effects of currently not working and of not participating in an employer pension plan on respondent's perceptions. Results are shown in Table 4.2 in the model for perceptions. We find that, as expected, currently not working (β = .380; p < .05) and not having an employer pension plan (β = .519; p < .05) both have a positive effect on individuals' perception of savings inadequacy compared to the others in the sample. In contrast, only individuals who are currently not working perceive themselves to be more financially constrained (β = 1.239; p < .05).

We then estimated ordered probit models of the direct effect of currently not working and of not participating in an employer pension plan on respondents' planning behavior (Table 4.2 – retirement planning model 1). Here we find in line with our expectations, that respondents who work but do not have an employer pension plan have a higher savings intention (β = .297; p < .05) but are not planning to retire later (n.s.). Respondents who are currently not working on the other hand do not intend to save extra (n.s.) but expect to retire later (β = .359; p < .05). To aid in interpretation of these estimation results we again computed the effect of a unit change in the latent variable in the ordered probit model on the predicted expected value of the outcome. These were very similar to the values reported in the results for Table 4.1. For the savings intention and planned retirement age we find an effect of 1.59 and 1.35 per unit change respectively.

[13] Respondents from the panel were selected who were working as an employee on the basis that they were nationally representative as to age and gender within the age group of 25 to 65 years.

Table 4.2: Perceptions and retirement planning for two vulnerable groups

	Perceptions			
Dependent variable	Savings inadequacy		Income constraints	
	β	*p*	*β*	*p*
Vulnerable groups				
Currently not working (unemployed/disabled)	.380 *	.019	1.239 **	.000
No pension plan participation	.519 **	.000	.151	.253
Perceptions				
Income constraints				
Savings inadequacy				
Controls				
Age	-.014 **	.000	.000	.993
Partner	-.154 *	.013	-.242 **	.000
Gender	.072	.258	.043	.505
No. of observations	1472		1472	
Pseuso R-square (Cox and Snell)	.047		.061	

** $p < .01$; * $p < .05$.

	Retirement planning							
	Model 1				Model 2			
Dependent variable	Savings intention		Planned retirement age		Savings intention		Planned retirement age	
	β	*p*	*β*	*p*	*β*	*p*	*β*	*p*
Vulnerable groups								
Currently not working (unemployed/disabled)	-.236	.166	.359 *	.024	-.193	.266	.252	.121
No pension plan participation	.297 *	.026	.204	.116	.226	.093	.181	.165
Perceptions								
Income constraints					-.104 **	.002	.088 **	.006
Savings inadequacy					.196 **	.000	.026	.349
Controls								
Age	.001	.835	.013 **	.000	.004	.244	.013 **	.000
Partner	-.024	.711	-.090	.137	-.018	.778	-.069	.260
Gender	-.040	.541	-.053	.390	-.051	.442	-.059	.346
No. of observations	1472		1472		1472		1472	
Pseuso R-square (Cox and Snell)	.004		.024		.034		.032	

** $p < .01$; * $p < .05$.

Mediation analysis

Next, we analyzed whether the direct effects of the vulnerable group on retirement planning are mediated by the perceived savings adequacy and income constraints of these groups. Therefore, we conducted a mediation analysis to test these predictions, following the guidelines of Baron and Kenny (1986). To do so we estimated a third model in which both perceptions and group membership were included as independent variables (see Table 4.2 retirement planning - model 2).

We already observed that for individuals who are currently not working, the effect of the independent variable (Currently not working) on the dependent variable (Planned retirement age) is significant, and that the effect of the independent variable (Currently not working) on the mediator (Strong income constraints) is also significant. Next, we jointly estimate the effect of the mediator (Strong income constraints) and the group membership variable (Currently not working) on the dependent variable (Planned retirement age). This analysis reveals a significant effect of Strong income constraints (β = .088; p = .006) and an insignificant influence of Savings inadequacy. Importantly, the effect of Currently not working is no longer significant (β = .252; p = .121). This provides strong support for a mediating role of perceptions, especially of perceived income constraints.

Second, for individuals who have no employer pension plan we follow a similar approach. Again we had already observed that the effects of the independent variable (No pension plan participation) on the dependent variable (Savings intention) and on the mediator (Savings inadequacy) are significant. We also regressed the dependent variable (Savings intention) on the mediator (Savings inadequacy) and the independent variable (No pension plan participation). This analysis revealed significant effects of perceived Savings inadequacy (β = .196; p = .000) and of Strong income constraints (β = -.104; p = .002). The effect of No Pension Plan Participation was no longer significant at 5% (β = .226; p = .093). This again provides support for the mediating effect of perceptions. It is worth noting that Strong income constraints does not mediate the relation between No Pension Plan Participation and Savings intention, as the effect of No Pension Plan Participation remains significant (β = .298; p = .026) when Strong income constraints is included as the only perception in the model.

In summary, these analyses of the two vulnerable groups provide further support for our hypotheses and demonstrate their practical relevance by connecting perception differences to directly observable variables such as pension plan participation and current working status. The results show that individuals who are currently not working plan to retire later but not to save more, and that they do so because their retirement planning is

driven by their perceived strong income constraints in combination with their perceived savings inadequacy. For individuals who do not participate in an employer pension plan, retirement planning is different, as they intend to save more for their retirement, but do not plan to retire later. This difference is only driven by their perceptions of having inadequate savings, as they do not face stronger income constraints (compared to the individuals in the reference group).

4.3.5 Exploring differences in communication channel use between the two vulnerable groups

To further increase the actionability of our findings for policy makers and pension fund managers, it is helpful to also obtain insight into how the different vulnerable groups can best be reached with communications that aim to assist them in making better decisions. The different groups may need to be targeted through different communication channels due to the inherent differences in their personal and labor market situation. Therefore, we collected some additional data from a small follow-up study, with a different sample. In this follow-up study we explored what information sources individuals typically intend to use when searching for information about retirement income and life after retirement.

Sample

For the follow-up study, we collected additional data from 468 individuals in a representative Dutch household panel, who were between 25 and 65 years old, were main wage earners and were working as an employee or were not working because they were unemployed or (partly) disabled. The average age of the respondents was 48 years, 76 percent were males, 65 percent had a partner and the median net household income was between 1801 and 2600 euro per month. In total, 47 respondents in this sample were currently not working (unemployed/disabled) and 22 respondents did not participate in an employer pension plan.[14]

Survey task and measures

In the survey respondents were shown a pre-specified list of information sources and were asked to indicate which information sources they would use to look for pension related information. Factor analysis, including information sources for both life after

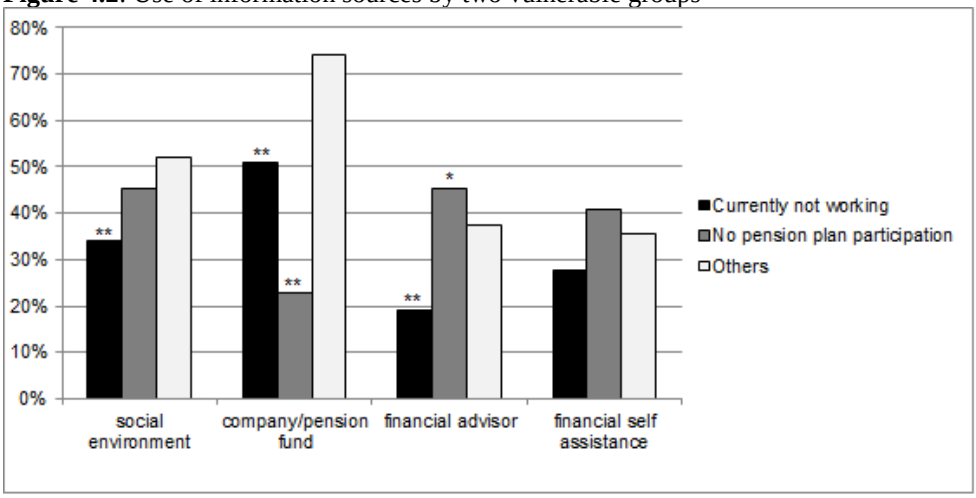
[14] Respondents who did not answer the survey completely (including the questions regarding their working status or pension plan participation) were not included in the analysis. This involved 83 respondents.

retirement and retirement income, revealed four general groups of sources that respondents use: social environment ("family, friends, or acquaintances"; "people who already have retired"; "colleagues"), company/pension fund ("the company you work(ed) for"; "your pension fund"), a professional financial advisor, and financial self-assistance ("financial magazines, guides and/ or books"; "financial information on the internet"; "financial calculators on the computer or internet"). To obtain a score of information source consideration we coded the use of a group as 1 (vs. 0) if the respondent considered to use at least one source that belongs to that particular group.

Results

The findings are summarized in Figure 4.2. The results show that individuals who are currently not working (unemployed/disabled) consider all sources of external information to a lesser extent in their planning for retirement compared to the baseline group ($p < .05$). For this sub-group there might be little need to access retirement information or to meet with a financial adviser if they do not have much discretionary income. Workers with no employer pension plan from their current or last job are, as expected, significantly less likely to use their company or a pension fund as an information source ($p < .05$), but interestingly they are marginally more likely to use a financial advisor ($p < .10$). The latter result may reflect the fact that these individuals carry a greater responsibility to arrange their own pension affairs.

Figure 4.2: Use of information sources by two vulnerable groups[§]



[§] Note: Significant from control group at ** $p < .05$ or * $p < .10$. Significance derived from logistic regression with as dependent variable 'source consideration' (yes vs. no) and as independent variables two dummies for 'currently not working' and 'no pension plan participation'.

4.4 Discussion

4.4.1 Theoretical contribution

Previous research has mainly focused on individuals' intentions to save for retirement and to plan for a certain retirement age as separate decisions and did not consider a joint decision making process (Knoll, 2011; Schalk et al., 2010, p. 86). In this paper, we have investigated these two different intentions simultaneously. By accounting for both strategies we have been able to provide deeper insight in how the two strategies are jointly decided upon. In particular, the results show that individuals have as a primary strategy to save more for retirement if they perceive their future retirement income to be inadequate. However, if their current income constraints are strong, they use planning to retire later as an alternative strategy. These results show that individuals tend to adjust their plans in a meaningful way by intending either to save more or to retire later, suggesting that individuals' retirement planning is fairly well aligned with economic principles.

In the last two decades, research in economic psychology and behavioral economics has emphasized that individuals are not always the rational well-informed agents that are able to make sound financial retirement plans. For example, individuals often do not have complete information, which may be due to a lack of financial knowledge (Lusardi & Mitchell, 2007b). This lack of information may withhold individuals from considering their future retirement situations (Van Rooij, Lusardi, & Alessie, 2011) and from even attempting to plan for retirement (e.g., Knoll, 2010, p. 4). By studying the retirement planning of individuals in two vulnerable groups (those who are currently unemployed and those who are not covered by an employer pension plan) we find that these individuals are aware of the fact that their retirement savings are inadequate. Moreover, using a mediation analysis, we highlighted the dampening effect of current income constraints on the intention to save more for retirement, but simultaneously these income constraints induce individuals to plan to retire later. With their preferred retirement planning strategy being infeasible, they shift to the second best option of retiring later. Future research could address what other behavioral factors can induce individuals to shift between the various strategies that aid in improving the adequacy of their anticipated retirement income.

4.4.2 Managerial contribution

From a managerial and public policy perspective, our results provide valuable insights for pension communications. We find that individual pension participants are heterogeneous and rely on different strategies when planning for retirement. Therefore,

communications may benefit from selecting segments of individuals that are likely to plan to prepare for their retirement in a similar way, for example based on factors such as the current (financial) situation of a person, because this allows for customization of segment-specific messages that have information that is aligned with the intentions of the recipients.

Our results suggest that different groups of individuals are best approached with different messages, particularly those that help them realize their desired solution path. Individuals who are saving inadequately, yet perceive low income constraints, could be helped by communications that stimulate them to save more, for example by increasing their pension plan contributions. Alternatively, individuals with a job, who have low savings adequacy and are financially constrained, might be helped by preparing them for a better-paying job or a longer career, for example through training and schooling programs. Finally, individuals who are not constrained but also do not perceive a lack of pension savings could be stimulated to check whether they indeed have accurate perceptions. Urging them to take financial action is likely to be ineffective, although providing them with an extra (precautionary) savings motive may potentially still lead to increased savings behavior. Whether such targeted, personalized communications aimed at improving savings adequacy are indeed effective could be validated in future research.

4.4.3 Limitations and future research

Our study also has some limitations and the findings suggest some interesting avenues for future research. First, although we find that individuals plan for a higher retirement age when the perceived income constraints are strong, these adjustments will only work well when individuals can also anticipate that they have the opportunity to work longer and that they are physically able to do so. Otherwise it is risky for individuals to anticipate a later retirement age. Policy makers could help create the appropriate conditions to work longer and thereby support individuals to execute this retirement planning strategy.

Second, in this study we argue that individuals can either choose to retire later or save more in response to inadequate retirement savings. While these two strategies are likely to be the most prominent strategies for individuals to follow, an alternative for individuals could also be to accept to live a more sober life after retirement. In this study we did not study how individuals think about this third alternative and whether it is part of their planning process.

Third, in future research it would be valuable to take into account possible interactions with personal characteristics of the individual such as their current age and if

they have a partner. Besides an individual's current financial situation, which we used in our study, age and the presence of a partner can be other important factors that determine one's ability to adjust savings (in terms of having the opportunity to still increase savings later). For example, previous research has shown that age can have a strong influence on how people think about their retirement (Van Schie, Dellaert, & Donkers, 2015). As such, age is also likely to influence whether individuals perceive saving or postponing retirement as the more valid strategy to overcome inadequate savings.

4.5 Conclusion

In this study we found an important role for individuals' perceptions of savings adequacy and current income constraints on their retirement planning. In particular, their current income constraints affect whether they will plan to save more for retirement or to retire later. We studied two vulnerable groups – those who are currently not working and those with no employer savings plan – that differ in terms of their current financial situation in more detail. We investigated their financial perceptions about perceived income constraints and their current level of savings adequacy, and their intentions to save extra and when to retire. We find that both groups are aware of being at risk of saving not enough for retirement. The difference in their perceived income constraints shifts how they respond to this savings problem. Those who are financially able to save more ('no pension plan participation' group) are more likely to increase their savings intentions instead of retiring later, while those who are not financially able to save more ('currently not working' group) are more likely to postpone their planned retirement age. We also analyzed the implications that this may have for pension communications and what channels may be most suitable for each group. Jointly these results support that individuals have a fairly accurate notion of their current retirement preparedness, but that based on their current financial situation, they tend to adjust their retirement plans by either planning to save more or to retire later. We hope that our research stimulates other researchers to further study the interplay of situational differences and environmental factors on individuals' planning for retirement.

Chapter 5

Conclusion and discussion

The objective of this dissertation was to improve our understanding of the drivers of individuals' retirement planning. Nowadays, it is well known that many individuals are not very eager to take active control in preparing for their retirement, but at the same time the (psychological) factors that underlie individuals' tendencies to plan for an adequate retirement remain to a great extent unexplored. Building upon previous research in economics and psychology, we study the processes that drive individuals to consider two important aspects in retirement planning, namely the decision to save more and when to retire. Our results are valuable for academic scholars and stakeholders involved in improving the preparedness for pension of the population. In this chapter, we provide a summary of the three chapters in the body of the dissertation and discuss their main implications and recommendations for future research.

5.1 Summary of main findings

In chapter 2 we presented a conceptual model to study the role of uncertainty regarding one's savings adequacy on retirement savings contributions and information search. While most individuals have some idea about the adequacy of their current savings for retirement, the feeling of uncertainty surrounding this expectation is also likely to affect savings behavior. We combined insights from literature in psychology and economics, as the two research streams provide opposing predictions regarding its impact on retirement savings contributions. Our results indicate that the effect of uncertainty is dependent on two factors, namely an individual's perceived adequacy of current savings and that individual's current financial constraints. More specifically, we find that uncertainty results in a higher intention to increase retirement contributions for those who believe that their current savings are adequate, while it results in a lower intention for those who think that their current savings are inadequate. This negative effect of uncertainty is conditional on an individual's current financial situation: a reduction in uncertainty results in a greater intention to save more only if that individual is not bound by insufficient financial resources. We also find a direct and indirect effect of uncertainty on information search. First, uncertainty has an indirect effect on information search as it affects

individuals' intention to save more, for which they engage in purchase-oriented information searches. In addition, uncertainty also has a direct effect, as individuals engage in ongoing information search to directly reduce the level of uncertainty.

In chapter 3, we studied the effect of (and interplay between) individuals' chronic representation of the retirement decision (in terms of which goal is primary) and an intervention-induced mindset on their planned retirement age. Building on Construal Level Theory, we considered the effect of a construal level intervention that activates either a global or a local mindset, on the relative importance of individuals' desirability (i.e. preference for when to retire) and feasibility goals (i.e. financial ability to retire). We find that the influence of a construal level intervention depends on an individual's age. That is, an intervention-induced global mindset increases the impact of desirability considerations on planned retirement age for younger individuals, but increases the impact of feasibility considerations for older individuals. The opposite is true for an intervention-induced local mindset. The reason is that as individuals become older and their temporal distance toward retirement decreases, their primary chronic retirement goal changes: younger individuals are primarily driven by desirability goals, while older individuals are primarily driven by feasibility goals. An important implication of these findings is that for those with a clear conflict between the two goals, namely individuals with a strong desire to stop working but with no financial means to save extra to retire early, younger individuals plan to retire earlier under a global processing mindset, while older individuals plan to retire later under this same condition.

In chapter 4 we investigated how individuals' intentions to increase their retirement savings or to retire later may be interrelated. While individuals can follow each of these strategies when their current savings are inadequate to support a comfortable retirement at their planned retirement age, previous research has mainly considered them as separate decisions. We find that individuals' intentions to use each of these strategies are dependent on their current financial situation. In particular, if individuals perceive their retirement savings to be inadequate, they have as a primary strategy to save more. However, if their current income constraints are strong, they use planning to retire later as a backup strategy. By analyzing the retirement plans of two vulnerable groups who are at risk of preparing inadequately, namely those who are currently not working and those with no employer pension plan, we found additional support for the notion that individuals use different strategies in response to an anticipated lack of pension savings.

5.2 Theoretical contribution

The aging population and the growing financial pressure on collective pension systems has led to reforms in eligibility ages and a shift of responsibilities for pension planning from the government, employers and pension funds towards individuals. Parallel with the growing responsibility being placed on individuals, the academic interest in investigating what factors drive or hinder individuals in planning for their retirement has grown. Still there remain many unknowns about the (psychological) mechanisms underlying individuals' planning tendencies (e.g. Croy et al., 2010a; Hershey, Jacobs-Lawson, et al., 2007). In the current dissertation I contribute to the literature in this domain in a number of ways.

At a general level, we combine insights from research in economics and psychology and find both research streams to be useful in explaining individuals' retirement planning tendencies. While traditional economic models of retirement planning often assume that individuals are rational decision-makers, who make decisions based on complete information and stable preferences, researchers in psychology and behavioral economics have questioned these assumptions. In chapter 2 we showed that by considering complementary economic theory (i.e. precautionary savings theory) and psychological theory (i.e. choice deferral theory) of coping with uncertainty, both theories are valuable in explaining the impact of uncertainty regarding one's savings adequacy on intended retirement savings. Chapter 3 revealed that, although individuals have relatively stable chronic preferences of the decision attributes that they consider to be primary and secondary in the retirement age decision, the context in which the decision is made – in this case a global or a local construal level intervention – can easily shift attention from one decision attribute to another, and hence affect individuals' decisions about their (planned) retirement age. These findings complement and emphasize the importance of other studies that aim to find non-economic explanations for retirement planning tendencies (e.g. Hershey, Jacobs-Lawson, et al., 2007; Lusardi & Mitchell, 2007a; Knoll, 2010) and support the idea that we can apply well-established findings of research in psychology, such as the role of uncertainty or the role of construal level interventions in consumer decision-making, to an investigation of individuals' intentions to save and plan for retirement. Finally, in chapter 4, we find that individuals who are at risk of preparing inadequately, use different strategies (save more or retire later) to cope with this anticipated lack of savings, which is dependent on the presence or absence of financial constraints. These results show that individuals tend to adjust their planning in a meaningful way, suggesting that individuals' retirement planning is fairly well aligned with economic principles.

Taking a closer look at each chapter's individual contribution, in chapter 2 we extend research that found that many individuals who anticipate a lack of retirement savings do not increase their intentions to save more (e.g. Choi et al., 2002). Our results provide a better understanding for this finding, as we demonstrate that uncertainty surrounding one's savings adequacy and financial ability are two important factors affecting whether an individual intends to save more (or search for information) in order to cope with an anticipated lack of savings. Chapter 4 provides yet another explanation. That is, not all individuals might intend to increase their savings when they think their current savings are inadequate: instead they may plan to retire later. Especially when current financial constraints are strong, this turns out to be a good alternative.

Chapter 3 contributes to the literature in construal level theory (CLT: Trope & Liberman, 2003, 2010), in particular with regard to CLT's consequences in the context of planning-decisions, such as planning for retirement. Two important characteristics of planning-decisions are that they often touch on trade-offs between feasibility and desirability goals and that one's temporal distance to the outcome of the decision may change over time or differ among individuals. The findings of chapter 3 show that in such contexts the temporal distance toward the outcome itself affects the primacy of feasibility (versus desirability) goals, and hence the goal that receives more attention under a global (versus local) mindset. We conclude that an individual's chronic construal level determines the rather stable mental representation of the decision in terms of primary and secondary goals. Temporary changes in construal level, for example those induced by construal level interventions, will then highlight different elements within this mental representation, depending on the primary and secondary goals that are present within the (pre-existing) stable mental representation. Thus, when examining the effects of global versus local construal level mindsets, it is important to take into account which goals are chronically perceived as primary and secondary. This insight may provide an overarching framework for previous work that reported that the consequences of global (vs. local) processing should be considered in relation to an individual's most central values and personality traits (Kivetz & Tyler, 2007; Verplanken & Holland, 2002) or an individual's chronic tendency to focus on either promotion- or prevention related concerns (Lee, Keller, & Sternthal, 2010). For research in the domain of self-control this has immediate implications as well (e.g. Fujita et al., 2006), as it provides more insight in the conditions under which global processing induces individuals to choose the more beneficial option for the long-term and when it does not.

In chapter 4 we investigated how intentions to save more or retire later are interrelated, where most previous research has investigated the intentions to use one of

these strategies separately (e.g. Wiener & Doescher, 2008; Taylor & Shore, 1995). We show that individuals use different strategies to cope with an anticipated gap in their retirement savings and provide a better understanding of how the two strategies are jointly decided upon.

5.3 Managerial implications

With the growing role for individuals in preparing for their retirement, governments' attention is increasing on the critical need to motivate individuals to engage in retirement planning and taking subsequent actions. The current communication efforts to trigger individuals have mainly relied on a one-size-fits-all approach. For example, most pension organisations make use of one generic information format to approach different target groups, without taking into account differentiating factors such as age or financial situation (Nell & Lentz, 2013). So far this approach has turned out to be quite ineffective in activating individuals, and it has been increasingly proposed that communications may benefit from selecting segments of individuals that are likely to prepare for their retirement in a similar way (e.g. Eberhardt, Brüggen, Post, & Hoet, 2016; Ministry of Social Affairs and Employment, 2012). Our findings support this view and provide valuable insights for pension communication. Most importantly, we find that individual pension planners are heterogeneous and that they rely on different strategies when planning for retirement. As such, this dissertation has a number of implications for policymakers and business practitioners that we discuss next.

In chapters 2 and 4 we find that an individual's tendency to plan for retirement is dependent on, among others, one's current financial situation and perceived adequacy of current savings. Communications may be tailored to these factors, which allows for customization of segment-specific messages, containing information that is aligned with the intentions of the recipient. Generalizing from our findings, especially those in chapters 2 and 4, we propose the conceptual classification for pension communication purposes shown in Table 5.1.

This classification shows the expected benefits and likely consequences of communication towards different segments. Different groups of individuals are best approached with different messages, particularly messages that help them realize their desired solution path. Individuals who do not save enough but who nonetheless have low income constraints could be helped by communications that stimulate them to save more, for example by suggesting to increase their pension plan contributions or by providing information that reduces the perceived uncertainty regarding their savings adequacy, as

shown in chapter 2. The results of chapter 2 also show that an active communication strategy is needed to activate this group of individuals, as they are less likely to search for information themselves. Besides, only providing information on the level of retirement income is not sufficient to reduce uncertainty and will, at most, only slightly activate behavior. Individuals with low savings and with financial constraints, on the other hand, might be helped by suggesting that they plan for later retirement, by preparing them for a better-paying job or a longer career, for example through training and schooling programs, or by pre-committing them to reconsider their ability to save more in the future. Individuals who are not constrained but who also do not perceive a lack of pension savings, could be stimulated to check whether they have accurate perceptions. Urging them to take financial action is likely to be ineffective, although providing them with an extra motive, such as precautionary savings, could potentially stimulate additional measures. Whether such targeted, personalized communications, aimed at improving savings adequacy, are indeed effective and feasible could be validated in future research. A practical constraint may be that pension funds do not always have a sufficient overview of a participant's full financial situation and may need to draw on alternative information sources to be able to determine the relevant segment structure. Besides, if legal requirements for providing pension information are too strict and standardized, this may limit pension providers' ability to approach different groups differently. As a final comment, please note that the proposed classification may be based on a broader set of causes than examined in this dissertation. For example, age is also likely to influence an individual's ability (in terms of time to save) to accumulate a substantial amount of extra savings.

Table 5.1: Segments for retirement communication

		Savings adequacy	
		Low	High
Perceived income constraints	Low	Communication most useful and desired to encourage *extra savings*.	Communication can increase pension *awareness* and can encourage taking *precautionary measures*.
	High	Communication useful and desired, but focused on suggesting *later retirement or alternative strategies*.	Communication can increase pension *awareness*, but is unlikely to affect behavior.

Chapter 3, where we show that different groups of individuals react differently on the same type of retirement intervention, has its own managerial implications. Its findings also highlight the relevance of taking into account individual differences when designing interventions that are aimed at supporting individuals in making pension decisions. In particular, our results show that the optimal construal level intervention to promote later retirement differs between younger and older individuals, especially for those who would like to retire early but who cannot afford to do so. For younger individuals, a global processing mindset stimulates them to resolve this decision conflict with an emphasis on the desirability aspect (i.e. preference to stop working) and hence induces them to plan to retire earlier. For older individuals, a global mindset has the opposite effect, as it stimulates them to resolve the conflict in favour of the feasibility aspect (i.e. financial feasibility to retire early) and hence induces them to plan to retire later. This has at least two important implications for pension providers. First, these results show that it is important to consider age-related differences in retirement goals and intentions when designing interventions and messages to support pension decision-making. Using the same type of intervention for all individuals can have opposing effects on decision-making for different segments, and may therefore lead to undesirable decision outcomes for some groups of individuals. Second, pension providers should carefully consider the decision context that they design, such as online information portals, because this context may very well induce a specific processing mode and may therefore have a significant impact on individuals' retirement planning. In chapter 3 we only studied the effects of construal level interventions and age on the decision when to retire. How these factors affect the intention to save more, and the corresponding trade-off in goals, are not yet examined and remain open for future research.

5.4 Future research

In this final part we discuss some limitations and propose avenues for future research regarding the topic of retirement planning. Across the three different studies, two main limitations need to be addressed. First, we recognize the limitation of using individuals' intentions to increase retirement savings, search for information and decide on when to retire. Although the likelihood that an individual will actually make extra savings contributions or decide when to retire will be an increasing function of one's intentions, it has been well-documented that other factors such as procrastination or self-control may withhold individuals to follow up on their intentions. The relative influence of these

different factors on actual retirement decisions remains an interesting area for future research. Future research could also benefit from including more realistic retirement decisions in the survey designs, that come closer to the real actions individuals take when they start their retirement planning, for example by giving individuals the choice to receive more information or to talk to an advisor immediately, or by letting them choose between different retirement schemes that differ in terms of the amount to be saved and the retirement age. A second limitation is that we use data from Dutch (household) panels in our studies. It would be interesting to see if the same results are obtained in other institutional settings or countries, for example in the United States where individuals face more own responsibility and uncertainty in planning for retirement.

In chapter 2 we could only address four factors that influence the level of uncertainty surrounding one's savings adequacy. This leaves open several interesting topics for future research. First, more research is needed to investigate other potential determinants of uncertainty. For example, the extent to which uncertainty is affected by individual psychological characteristics or by an unpredictable (external) decision environment could be addressed. Second, additional research could determine the extent to which individual feelings of uncertainty can be reduced and how best to support individuals in this process.

In chapter 3 we highlight the importance of taking into account changes in the mental representation of retirement goals over the life-cycle. In particular, we found that chronic temporal distance to retirement (i.e. age) changes the relative importance of desirability and feasibility oriented goals. In a related study, see Appendix E (Van Schie, Dellaert, & Donkers, 2013: study 1), we found additional support for such age-related differences: younger workers are more likely to plan to retire at an early age that is currently not affordable to them, indicating that younger workers weigh feasibility goals relatively less and desirability goals relatively more. For pension providers and marketers, age is likely to be an easily identifiable factor for segmentation. When developing new communication strategies for pension planners, it is important that the information that is provided can be easily integrated into the existing mental representation of different age groups. A match between the pension planner's mental representation and the planning information that a person retrieves is likely to result in more favorable attitudes toward retirement planning and hence a greater willingness to engage in it (e.g., Lee, Keller, & Sternthal, 2010; Köhler, Breugelmans, & Dellaert, 2011; White, MacDonnel, & Dahl, 2011). Future research could study how different information formats, tailored at different age groups, influence subsequent planning decisions of younger and older retirement planners.

For example, previous research has indicated that a promotion focus (i.e. focus on the presence or absence of positive outcomes) tends to predominate for temporally distant goals, whereas a prevention focus is relatively more important for proximal goals (e.g. Pennington & Roese, 2003) and that an individual's general goal orientation typically tends to shift from growth toward maintenance and loss prevention as they grow older (Freund & Ebner, 2005; Freund, Hennecke, & Riediger, 2010). Hence, the interplay between age, global (vs. local) and promotion (vs. prevention) framed messages may be an interesting topic to study in order to differentiate between younger and older retirement planners and to encourage them to take the first steps in planning for their retirement.

In chapter 3 we also highlight the difference between primary and desirability goals and between secondary and feasibility goals. This could be a more frequent phenomenon. One example could be the selection of a course to follow. When the course is more distant, desirability goals (e.g. this course will look good on my CV) might be primary, while in a shorter time perspective, so the course is about to start, the feasibility of the course (e.g. I can pass the course with reasonable effort) might be primary. A broader exploration of the differences between primary (secondary) versus desirability (feasibility) goals, such as mentioned in this example, would be helpful to further improve our understanding of the influences of chronic versus temporally induced construal level mindsets in the context of individual planning.

The study in chapter 4 could be extended in several ways. First, we argued that individuals can either choose to save more or to retire later in response to inadequate savings. While these two strategies are likely to be the most prominent ones for individuals to follow, individuals may also choose other strategies, such as leading a more sober life after retirement, choosing deliberately to start saving at a later point in time, or saving for multiple purposes (e.g. buying a house). In this study we didn't consider these alternative strategies and to what extent they are part of the planning process. Second, while we considered an individual's financial situation as either a constraint or facilitator of planning, future research could take into account additional personal factors that determines one's ability to adjust savings, such as an individual's age (in terms of time to save) or having a partner.

At a more general level it would be worthwhile to analyse how changes in government and social policy with respect to retirement age and labor market arrangements affect the ability of individuals to absorb shocks in their retirement savings. Our research in chapter 4 suggests that especially financially vulnerable groups, such as the unemployed, may have fewer and fewer options to compensate for a loss in retirement income as the retirement age goes up. Due to the income constraints that they face, they

have very limited opportunity to increase their retirement savings. Whereas in the past they could choose to work beyond the traditional retirement age of 65, in the future they may not be able to do so as their capacity to work beyond a new retirement age, of for example 72 years, may be limited.

To conclude, this dissertation has brought new insights into the processes underlying individuals' tendencies to plan for retirement. Despite these new findings and considerable progress that has been made in the literature in general, many influential topics related to (the drivers of) retirement planning remain for future research. One of the challenges in studying the differences in retirement planning behavior, is to have a sufficient amount of data that adequately covers the different (and heterogeneous) groups involved. I hope that this dissertation will motivate others to take on this and the many other challenges, and will stimulate other academic researchers to further develop the field of individual retirement planning.

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Appendix

Appendix A: Description of variables chapter 2

Table A.1: Multi-item measures

Construct	Source	Scale	Item description	Construct α	Mean
Goal clarity	Adapted from Hershey, Henkens, & van Dalen, 2007	1-5	I have a clear vision of how life will be in retirement. I know what I want to do after retirement. I think a great deal about (quality of) life in retirement.	.771	2.76
Income knowledge	Not previously published	1-5	I feel comfortable when I have to estimate how much income I will receive after retirement. I am very knowledgeable about the amount of my monthly income after age 65. I have insight into the structure of my retirement income.	.895	2.67
Financial literacy	Adapted from Hershey, Henkens, & van Dalen, 2007	1-5	I am very knowledgeable about financial issues. When I have a need for financial services, I know exactly where to obtain information on what to do. I am confident in my own ability when I have to make financial decisions.	.800	3.19
Risk aversion	Adapted from Donkers & van Soest, 1999	1-7	I think it is more important to have safe investments and guaranteed returns, than to take a risk to have a chance to get the highest possible returns. I would never consider investments in shares because I find this too risky. I want to be certain that my investments are safe.	.666	5.02

Table A.2: Socio-demographic control variables

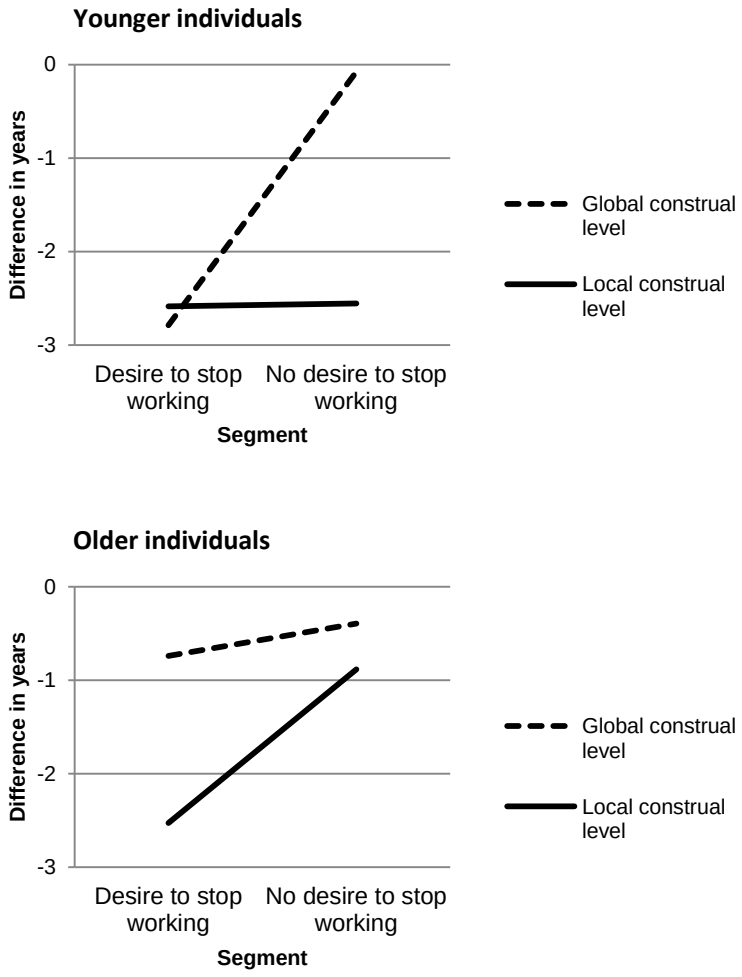
Variable	Measurement	Mean
Age	Age of respondent in years	48.39
Gender	Sex of respondent (0 = male; 1 = female)	.48
Education (in years)	Highest level of education in categories of Statistics Netherlands (in years)	13.06
Household income	Monthly total net income of all respondents in a household (x 1000 euro)	2.78
Number of children	Number of children in the household	.93
Partner	Is there a partner present in the household? (0 = no; 1 = yes)	.77
Main wage earner	Are you the main wage earner of the household (i.e. highest income)? (0 = no; 1 = yes)	.63
Financial administrator	Are you the person who is most involved with the financial administration of the household? (0 = no; 1 = yes)	.67
Pension fund	Does your current/ last job (before your retirement) entitle you to a retirement pension (apart from old-aged pension law/ AOW)? (0 = no; 1 = yes)	.74
Dummy pension fund missing	Missing values for "pension fund" (0 = not missing; 1 = missing)	.12
Primary occupation (dummy coded)	Primary occupation of the respondent	
	1 employee: employed on a contractual basis	.71
	2 works in own business	.01
	3 self-employed, free profession, freelance	.05
	4 unemployed: looking for work after having lost job	.02
	5 works in own household	.12
	6 (partly) disabled	.07
	7 unpaid work, keeping benefit payments	.01
	8 works as a volunteer	.01
	9 other occupation	.01
Past information search (mean score)	Calculations have been made to estimate how much money I need to save to retire comfortably (disagree 1-5 agree)	2.31
	The last few years I collected information about financial planning and pensions (disagree 1-5 agree)	
Past savings	The past few years I made extra contributions in order to supplement my income after retirement (disagree 1-7 agree)	3.48

Appendix B: Description of control variables chapter 3

Variable	Measurement	Scale
Gender	What is your gender?	0 = male; 1 = female
Education	What is the highest level of education completed?	Six categories from Primary education to University.
Partner	Are you living together with a partner?	0 = no; 1 = yes
Age partner	If yes, what is the age of your partner?	n/a
Health	In general, how would you say your health is?	1 = excellent; 5 = poor
Main wage earner	Are you the main wage earner in your household?	0 = no; 1 = yes
Income	What is the net monthly income of your household?	< 1000 euro 1000-2000 euro 2000-3000 euro 3000-5000 euro > 5000 euro Don't want to say
Manage on current income	If you consider the next 12 months, how well do you expect to manage on the total income of your household?	1 = very hard; 5 = very easy
External constraint	I expect that, because of external circumstances such as a bad health or being fired by my employer, I will not be able to work in the last few years before the state pension age. I believe that external circumstances over which I have little control will oblige me to stop working before the state pension age. Circumstances over which I have little control will probably force me to stop working before the state pension age.	1 = disagree; 7 = agree (Cronbach alpha = .90)

Appendix C: Illustration of three-way interaction effect for desire to stop working

Figure B.1: Predicted planned retirement age relative to expected state pension age: Illustration of the probit model's three-way interaction effect for desire to stop working



Note 1: The y-axis shows the difference between the planned retirement age and expected state pension age. A positive value implies that the respondent plans to retire after the expected state pension age, whereas a negative value implies that he or she plans to retire before the state pension age.

Note 2: To create this graph we calculated the planned retirement age relative to expected state pension age using the estimated probit model for all (eight) combinations of *age* (younger vs. older individuals), *construal level intervention* (global vs. local), and *desire to stop working* evaluated at the 20th and 80th percentiles of the distribution. All other variables, including *financial feasibility*, were held constant at the sample average.

Appendix D: Sample characteristics chapter 4

	Mean	Std. Deviation	Minimum	Maximum
Planned pension age	64.23	3.13	42	90
Planned pension age – expected AOW age	-1.71	2.93	-13	14
Savings intention	2.51	1.77	1	7
Income constraints	2.50	0.95	1	5
Savings inadequacy	3.07	1.11	1	5
No pension plan participation	0.05	0.22	0	1
Currently not working: current status	0.03	0.18	0	1
Other variables				
Gender (1 = male; 2 = female)	1.38	0.48	1	2
Age	48.47	9.59	25	65
Partner (1 = no, 2 = yes)	1.62	0.48	1	2

	Frequency	Percent	Cumulative
Education (Dutch categories)			
Primary education	16	1.1	1.1
Pre-vocational (vmbo)	109	7.4	8.5
Pre-university (havo/vwo)	117	7.9	16.4
Secondary vocational (mbo)	301	20.4	36.9
University of applied science (hbo)	598	40.6	77.5
University	331	22.5	100.0
Net household income (euros per month)			
<1000	22	1.5	1.5
1000-2000	360	24.5	26.0
2000-3000	413	28.1	54.1
3000-5000	380	25.8	79.9
>5000	94	6.4	86.3
Missing	203	13.8	100.0

Appendix E: More evidence on chronic goal differences between younger and older workers

Appendix E is based on study 1 of a Netspar publication (Van Schie, Dellaert, & Donkers, 2013).

Objective

In chapter 3 we argue that individuals' primary chronic retirement goals change as they become older and their temporal distance toward retirement decreases. Since distance toward retirement is inherently different for younger and older individuals, we predict a shift in workers' mental representations of the retirement decision when they grow older. In particular, we expect that the primary goals for younger workers are desirability oriented, because they are temporally distant from the retirement decision. For older workers, who are temporally closer to retirement, we expect that they are relatively more concerned about the feasibility of their decision. This heterogeneity in goals may also explain why younger individuals generally plan to retire earlier than older individuals, as younger workers are relatively more concerned about their desired goal of retiring earlier than about the feasibility of being able to pay for this earlier retirement age. As a consequence, we hypothesize that younger workers are less concerned with feasibility and more likely to report a retirement age that they cannot afford based on their current savings. The objective of this study was to investigate if younger workers are indeed more likely than older workers to plan to retire at an age that is currently (based on their current saving behavior) not feasible to them, and if this explains why younger individuals plan to retire earlier.

Sample

The study involved a questionnaire-based survey in which respondents were asked questions about their (planning for) retirement. A total of 245 panel members from a Dutch online research panel participated in the study. Respondents from the panel were selected who worked as an employee for at least 30 hours per week, were participating in an employer pension plan, and were between ages 40 and 60. Furthermore, respondents were excluded from the analysis based on their involvement with the survey, which was inferred from (extremely fast) response times and from the answers to an open ended question on thoughts around retirement. Finally, participants who indicated to plan to retire earlier than 14 years before or later than 14 years after the state pension age were excluded. In the study there were two subgroups that differed in whether or not they received general

information in the survey about the costs of early retirement. The results below are based on the pooled sample because a separate analysis in each subgroup resulted in directionally identical results, but lowered significance levels. Respondents were divided in two groups that included either younger (age 40-50, n = 102) or older respondents (age 51-60, n = 143).

Measurement of dependent and independent variables

Planned retirement age – To capture individuals' intention to retire early, we combined two questions to gauge how much earlier participants' planned to retire than the age at which they expected to become eligible for state pension. Thus, planned retirement age was measured using the following open-ended question: "Considering that you now have to indicate at what age you will retire, what age would that be?" To measure the age at which the respondent expected to become entitled to a state pension, they answered the question: "At what age do you expect to begin to receive a state pension?" A composite planned retirement scale was formed by subtracting the respondent's expected state pension age from the respondent's planned retirement age. This allowed us to correct for respondents' anticipated changes in the state pension regulations as driver of their planned retirement age. A positive value on our composite scale implies that a respondent plans to work beyond the expected official state pension age, whereas a negative value implies that the respondent plans to retire before being entitled to the state pension.

Feasibility of the planned retirement age – To be able to investigate the effect of individuals' current age on the perceived feasibility of their planned retirement age, respondents were asked whether they considered their planned retirement age to be feasible to them based on their current saving behavior. In particular, we adopted the savings adequacy scale used by Van Schie, Donkers, and Dellaert (2012), and measured feasibility using a five-point scale ranging from "totally inadequate" to "totally adequate" in response to the following question: "You indicated that you expect to retire at the age of [planned retirement age of the respondent]. Imagine that you will NOT adjust your current saving behavior. In this case, do you expect to have adequate financial resources at this age to live comfortably after retirement?"

Control variables – We control for socio-demographic variables and external constraints that may force individuals to involuntarily retire sooner.

Model

To study the relationships between individuals' current age and the feasibility of their planned retirement age we estimate an ordered probit model. The reason is that feasibility of planned retirement age is measured on an ordinal scale with 5 categories, which makes the ordered probit model appropriate. To verify that the low feasibility of planned retirement age is an important factor in driving the difference in planned retirement ages across young and old, we test whether feasibility mediates the impact of age on planned retirement age. Also in this analysis we rely on the ordered probit model, as the planned retirement age tends to be ordinal as well.

Results and discussion

We regressed respondents' perceived feasibility of the planned retirement age on their age group, while controlling for a number of other variables. The results are presented in the first column of Table E.1 and reveal a significant effect (β = -.362; $p < .05$) of being young (vs. old). This indicates that as hypothesized younger (vs. older) workers are more likely to plan to retire at an age they currently cannot afford.

If this difference is the result of a different trade-off between desirability and feasibility goals, it should also have consequences for the planned retirement age itself. In particular, younger people pay more attention to desirability and might sacrifice more on the feasibility aspects of their plans. To see whether indeed this trade-off is made between feasibility and desirability goals, we estimate an ordered probit model with planned retirement age as the dependent variable and feasibility, age group (younger vs. older group) and the control variables as independent variables. The estimation results are reported in the second column of Table E.1. This analysis revealed a significant positive effect of feasibility of the planned retirement age (β = .188; $p < .01$). So, people who are willing to retire at an age that they currently cannot afford, i.e. those with a low importance for feasibility goals and low scores on feasibility, also tend to plan to retire earlier, i.e. they achieve their desirability goals.

A remarkable finding in this analysis is that there is no direct effect of age on the planned retirement age (β = -.212; n.s.). This is in contrast with earlier literature showing that younger people tend to retire earlier (Taylor & Shore, 1995). Repeating the previous analysis, but without feasibility as a predictor variable, we do find a significant negative impact of being young on planned retirement age (β = -.276; $p < .05$), see column 3 of Table E.1. This suggests that the effect of age on planned retirement age is mediated by the feasibility of the planned retirement age. In other words, younger workers are less driven by feasibility and more focused on desirability, hence they are more willing to retire at an

early (more desirable) age that is currently not (or less) feasible to them. A Sobel test confirmed that Feasibility mediated the effect of Age on Planned Retirement (z = 1.952; p = .026 one-tailed).

Conclusion

Thus, we find that younger workers plan to retire earlier than older workers, and that younger workers are more likely to plan to retire at an age that is currently not feasible to them. These findings provide additional support for the expectation that chronic temporal distance to retirement (age) changes the relative importance of desirability and feasibility oriented retirement goals: younger workers pay less attention to feasibility concerns and more to desirability concerns than older workers.

Table E.1: Estimation results ordered probit models

Dependent	Feasibility of planned retirement age			Planned retirement age[a]			Planned retirement age[a]		
	β		*p*	*β*		*p*	*β*		*p*
Age (young = 1; older = 0)	-.362	**	.011	-.212		.132	-.276	*	.047
Feasibility of planned retirement age				.188	**	.003			
Control variables									
Gender (female)	-.237		.178	.108		.533	.061		.724
Education	-.030		.388	-.020		.557	-.025		.463
Partner	-.247		.187	-.374	*	.043	-.412	*	.025
Age – age partner	-.006		.596	.012		.295	.010		.367
Bad health	-.091		.407	-.189		.081	-.199		.064
Main wage earner	.017		.950	-.161		.543	-.159		.546
Income	.110		.308	-.060		.572	-.042		.688
Income missing	.700		.102	.007		.986	.115		.784
Manage on current income	.506	**	.000	-.278	**	.003	-.179	*	.039
External constraint	-.098	*	.046	-.013		.790	-.031		.522
No. of observations	245			245			245		
Pseudo R-square (Cox & Snell)	.234			.117			.084		

[a] Planned age relative to anticipated state pension age.
** p < .01; * p < .05.

References

Achtziger, A., Martiny, S. E., Oettingen, G., & Gollwitzer, P. M. (2012). Metacognitive processes in the self-regulation of goal pursuit. In P. Briñol & K. G. DeMarree (Eds.), *Social metacognition* (pp. 121-140). New York: Psychology Press.

Adams, G. A. (1999). Career-related variables and planned retirement age: An extension of Beehr's model. *Journal of Vocational Behavior, 55*(2), 221-235.

AFM, Netherlands Authority of the Financial Markets (2011). *AFM Consumentenmonitor Najaar 2011 Pensioen (AFM Consumer Monitor Autumn 2011 Pension)* (in Dutch).

AFM, Netherlands Authority of the Financial Markets (2015). *Neem drempels weg opdat Nederlanders in actie komen voor hun pensioen* (in Dutch).

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179-211.

Ajzen, I. (2002). Perceived behavioral control, self-efficacy, locus of control and the theory of planned behavior. *Journal of Applied Social Psychology, 32*(4), 665-683.

Atchley, R. C., & Robinson, J. L. (1982). Attitudes toward retirement and distance from the event. *Research on Aging, 4*(3), 299-313.

Bagozzi, R. P., & Dabholkar, P. A. (1994). Consumer recycling goals and their effect on decisions to recycle: A means-end chain analysis. *Psychology & Marketing, 11*(4), 313-340.

Bargh, J. A., Gollwitzer, P. M., & Oettingen, G. (2010). Motivation. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (Vol. 2, 5th ed., pp. 268-316). New Jersey: John Wiley and Sons.

Baron, R. M., & Kenny, D. A. (1986). The moderator–mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of personality and social psychology, 51*(6), 1173-1182.

Beach, L. R., & Mitchell, T. R. (1987). Image theory: Principles, goals and plans in decision making. *Acta Psychologica, 66*(3), 201-220.

Beatty, S., & Smith, S. M. (1987). External search effort: An investigation across several product categories. *Journal of Consumer Research, 149*(1), 83-95.

Beehr, T. A., Glazer, S., Nielson, N. L., & Farmer, S. J. (2000). Work and nonwork predictors of employees' retirement ages. *Journal of Vocational Behavior, 57*(2), 206-225.

Bernheim, B. D., & Scholz, J. K. (1993). Private saving and public policy. In J. M. Poterba (Ed.), *Tax policy and the economy* (Vol. 7, pp. 73-110). Cambridge: MIT Press.

Beshears, J., Choi, J. J., Laibson, D., & Madrian, B. C. (2008). The importance of default options for retirement savings outcomes: Evidence from the United States. In S. J. Kay, & T. Sinha (Eds.), *Lessons from pension reform in the Americas* (pp. 59-87). Oxford: Oxford University Press.

Bloch, P. H., Sherrell, D. L., & Ridgway, N. M. (1986). Consumer search: An extended framework. *Journal of Consumer Research, 13*(1), 119-126.

Bloomberg Business (2014). The secret to saving less for retirement: Work until 70. July 26 2014.

Bloomberg Business (2010). Pension reform: Europe wants later retirement. July 16 2010.

Bodie, Z. & Prast, H. (2012). Rational pensions for irrational people: Behavioral science lessons for the Netherlands. In: L. Bovenberg, C. van Ewijk, & E. Westerhout (Eds.), *The Future of Multi-Pillar Pensions* (pp. 299-329). Cambridge: Cambridge University Press.

Carroll, C. D., & Kimball, M. S. (2008). Precautionary saving and precautionary wealth. In S. N. Durlauf, & L. E. Blume (Eds.), *The new Palgrave dictionary of economics*, (2nd ed., pp. 579-584). London: Palgrave MacMillan.

Carroll, C. D., & Samwick, A. A. (1998). How important is precautionary saving? *The Review of Economics and Statistics, 80*(3), 410-419.

Chan, S., & Stevens, A. H. (2008). What you don't know can't help you: Pension knowledge and retirement decision-making. *The Review of Economics and Statistics, 90*(2), 253-266.

Chiou, W. B., Wu, W. H., & Chang, M. H. (2013). Think abstractly, smoke less: a brief construal-level intervention can promote self-control, leading to reduced cigarette consumption among current smokers. *Addiction, 108*(5), 985-992.

Choi, J. J., Laibson, D., Madrian, B. C., & Metrick, A. (2002). Defined contribution pensions: Plan rules, participant choices, and the path of least resistance. In J. M. Poterba (Ed.), *Tax policy and the economy* (Vol. 16, pp. 67-114). Cambridge: MIT Press.

Clark, R. L., d'Ambrosio, M. B., McDermed, A. A., & Sawant, K. (2004). Sex differences, financial education, and retirement goals. In O. S. Mitchell & S. P. Utkus (Eds.), *Pension design and structure: New lessons from behavioral finance* (pp. 185-206). Oxford: Oxford University Press.

Croy, G., Gerrans, P., & Speelman, C. (2010a). The role and relevance of domain knowledge, perceptions of planning importance, and risk tolerance in predicting savings intentions. *Journal of Economic Psychology, 31*(6), 860-871.

Croy, G., Gerrans, P., & Speelman, C. (2010b). Injunctive social norms primacy over descriptive social norms in retirement savings decisions. *International Journal of Aging and Human Development*, *71*(4), 259-282.

Cuelenaere, B., & Chotkowski, M. (2008). Werkt grijs door? Beroepsbevolking en werkgevers over langer doorwerken, 2005-2007 (in Dutch). Ministerie van Sociale Zaken en Werkgelegenheid. The Netherlands, Rotterdam: Ecorys Nederland BV.

Danziger, S., Montal, R., & Barkan, R. (2012). Idealistic advice and pragmatic choice: A psychological distance account. *Journal of Personality and Social Psychology, 102*(6), 1105-1117.

Davies, J. B. (1981). Uncertain lifetime, consumption, and dissaving in retirement. *The Journal of Political Economy*, *89*(3), 561-577.

Davis, K., & Hustvedt, G. (2012). It's a matter of control: Saving for retirement. *International Review of Social Sciences and Humanities*, *3*(2), 248-261.

Dhar, R. (1997). Consumer preference for a no-choice option. *Journal of Consumer Research, 24* (2), 215-231.

Donkers, B., & van Soest, A. (1999). Subjective measures of household preferences and financial decisions. *Journal of Economic Psychology, 20*(6), 613-642.

Eberhardt, W., Brüggen, E., Post, T., & Hoet, C. (2016). Segmentation of pension plan participants: Identifying dimensions of heterogeneity. *Netspar Industry Paper Series, design paper 47*.

Economist (2013). Working-age shift. Growth will suffer as workers dwindle. January 26 2013.

Economist (2014). Age Invaders. April 26 2014.

Ekerdt, D. J., Bossé, R., & Mogey, J. M. (1980). Concurrent change in planned and preferred age for retirement. *Journal of Gerontology*, *35*(2), 232-240.

Esser, I. (2006). Continued work or retirement? Preferred exit-age in Western European countries. In H. Emanuel (Ed.), *Ageing and the labour market: Issues and solutions. Or are there?* (pp. 43-80), Antwerp and Oxford: Intersentia Publishers.

Euwals, R., Van Vuuren, D., & Wolthoff, R. (2010). Early retirement behaviour in the Netherlands: Evidence from a policy reform. *De Economist, 158*(3), 209-236.

Eyal, T., Liberman, N., Trope, Y., Walther, E. (2004). The pros and cons of temporally near and distant action. *Journal of Personality and Social Psychology*, *86*(6), 781-795.

Feldman, D.C. (1994). The decision to retire early: A review and conceptualization. *Academy of Management Review*, *19*(2), 285-311.

Financial Times (2013). Chinese labour force begins to drain. January 13 2013.

Freund, A. M., & Ebner, N. C. (2005). The aging self: Shifting from promoting gains to balancing losses. In W. Greve, K. Rothermund, & D. Wentura (Eds.), *The adaptive self: Personal continuity and intentional self-development* (pp. 185–202). New York: Hogrefe.

Freund, A. M., Hennecke, M., & Riediger, M. (2010). Age-related differences in outcome and process goal focus. *European Journal of Developmental Psychology, 7*(2), 198-222.

Fujita, K., & Han, H. A. (2009). Moving beyond deliberative control of impulses: The effect of construal levels on evaluative associations in self-control conflicts. *Psychological Science*, *20*(7), 799-804.

Fujita, K., & Roberts, J. C. (2010). Promoting prospective self-control through abstraction. *Journal of Experimental Social Psychology, 46*(6), 1049-1054.

Fujita, K., Trope, Y., Liberman, N., & Levin-Sagi, M. (2006). Construal levels and self-control. *Journal of Personality and Social Psychology, 90*(3), 351-367.

Gasper, K., & Clore, G. L. (2002). Attending to the big picture: Mood and global versus local processing of visual information. *Psychological Science*, *13*(1), 34-40.

GfK (2015). Delta Lloyd. Hoe gaat NL met pensioen – landenvergelijking. (in Dutch). May 2015. Research report retrieved from http://apps.nrc.nl/images/Delta_Lloyd_Hoe_gaat_NL_met_pensioen-landenvergelijking-rapport.pdf on April 21 2016.

Goudswaard, K. P. (2014). Blijft het Nederlandse pensioenstelsel bijzonder? In: *Jaarboek 2014, Koninklijke Vereniging voor de Staathuishoudkunde* (pp. 19-25). Den Haag (previously published in R. Bijl et al. (Eds.), *Opvallend gewoon. Het bijzondere Nederland*. Den Haag: Sociaal en Cultureel Planbureau, 2013).

Greene, W. H. (2003). *Econometric analysis* (5th ed.). Upper Saddle River, New Jersey: Pearson Education, Inc.

Gruber, J. & Wise, D. A. (1999). *Social security and retirement around the world*, eds. J. Gruber and D. A. Wise. Chicago University of Chicago Press.

Harinck, F., Van Dijk, E., Van Beest, I., & Mersmann, P. (2007). When gains loom larger than losses: Reversed loss aversion for small amounts of money. *Psychological Science, 18*(12), 1099-1105.

Helman, R. (2015). The 2015 retirement confidence survey: Having a retirement savings plan a key factor in Americans' retirement confidence. *Employee Benefit Research Institute Issue Brief*, no. 413 (April).

Helman, R., Copeland, C., & VanDerhei, J. (2010). The 2010 retirement confidence survey: Confidence stabilizing, but preparations continue to erode. *Employee Benefit Research Institute Issue Brief*, no. 340 (March).

Hershey, D. A., Henkens, K., & van Dalen, H. P. (2007). Mapping the minds of retirement planners: A cross-cultural perspective. *Journal of Cross-Cultural Psychology, 38*(3), 361-382.

Hershey, D. A., Jacobs-Lawson, J. M., McArdle, J. J., & Hamagami, F. (2007). Psychological foundations of financial planning for retirement. *Journal of Adult Development, 14*(1-2), 26-36.

Hershey, D. A., Walsh, D. A., Brougham, R., Carter, S., & Farrel, A. (1998). Challenges of training pre-retirees to make sound financial planning decisions. *Educational Gerontology, 24*(5), 447-470.

Howard, J. A., & Sheth, J. N. (1969). *The Theory of Buyer Behavior*. New York: Wiley.

Hubbard, R. G., Skinner, J., & Zeldes, S. P. (1995). Precautionary saving and social insurance. *Journal of Political Economy, 103*(2), 360-399.

Iyengar, S. S., Huberman, G., & Jiang, W. (2004). How much choice is too much? Contributions to 401(k) retirement plans. In O. S. Mitchell & S. P. Utkus (Eds.), *Pension design and structure: New lessons from behavioral finance* (pp. 83-96). Oxford: Oxford University Press.

Janiszewski, C. (1998). The influence of display characteristics on visual exploratory search behavior. *Journal of Consumer Research, 25*(3), 290-301.

Kahneman, D., Knetsch, J. L., & Thaler, R. H. (1991). Anomalies: The endowment effect, loss aversion, and status quo bias. *The Journal of Economic Perspectives, 5*(1), 193-206.

Kapteyn, A. & De Vos, K. (1999). Social security and retirement in the Netherlands, in J. Gruber, & D.A. Wise (Eds.), *Social security and retirement around the world* (pp. 269-305). Chicago: University of Chicago Press.

Keinan, A., & Kivetz, R. (2008). Remedying hyperopia: The effects of self-control regret on consumer behavior. *Journal of Marketing Research, 45*(6), 676-689.

Kim, K. T., Hanna, S. D., & Chen, S. C. C. (2014). Consideration of retirement income stages in planning for retirement. *Journal of Personal Finance, 13*(1), 52-64.

Kim, S. & Feldman, D.C. (2000). Working in retirement: The antecedents of bridge employment and its consequences for quality of life in retirement. *Academy of Management Journal, 43*(6), 1195-1210.

Kivetz, Y., & Tyler, T. R. (2007). Tomorrow I'll be me: The effect of time perspective on the activation of idealistic versus pragmatic selves. *Organizational Behavior and Human Decision Processes, 102*(2), 193-211.

Knoef, M., Been, J., Alessie, R., Caminada, K., Goudswaard, K., & Kalwij, A. (2016). Measuring retirement savings adequacy: Developing a multi-pillar approach in the Netherlands. *Journal of Pension Economics and Finance*, 15(1), 55-89.

Knoef, M., Goudswaard, K., Been, J. & Caminada, K. (2015). Veel variatie in de pensioenopbouw van Nederlandse huishoudens (Large variation in retirement savings among Dutch households) (in Dutch). Netspar Brief 2, Tilburg University.

Knoll, M. A. Z. (2010). The role of behavioral economics and behavioral decision making in Americans' retirement savings decisions. *Social Security Bulletin, 70*(4), 1-23.

Knoll, M. A. Z. (2011). Behavioral and psychological aspects of the retirement decision. *Social Security Bulletin, 71*(4), 15-32.

Köhler, C. F., Breugelmans , E., & Dellaert, B. G. C. (2011). Consumer acceptance of recommendations by interactive decision aids: The joint role of temporal distance and concrete versus abstract communications. *Journal of Management Information Systems*, *27*(4), 231-260.

Kray, L., & Gonzalez, R. (1999). Differential weighting in choice versus advice: I'll do this, you do that. *Journal of Behavioral Decision Making, 12*(3), 207-218.

Lee, A. Y., Keller, P. A., & Sternthal, B. (2010). Value from regulatory construal fit: The persuasive impact of fit between consumer goals and message concreteness. *Journal of Consumer Research*, *36*(5), 735-747.

Leiser, D., Azar, O. H., & Hadar, L. (2008). Psychological construal of economic behavior. *Journal of Economic Psychology*, *29*(5), 762-776.

Lipshitz, R., & Strauss, O. (1997). Coping with uncertainty: A naturalistic decision-making analysis. *Organizational Behavior and Human Decision Processes, 69*(2), 149-163.

Loewenstein, G., Read, D., & Baumeister, R. F. (2003).Time and decision: Economic and psychological perspectives on intertemporal choice. New York, Russell Sage Foundation.

Luce, M. F. (1998). Choosing to avoid: Coping with negatively emotion-laden consumer decisions. *Journal of Consumer Research*, *24*(4), 409-433.

Lusardi, A. (1997). Precautionary saving and subjective earnings variance. *Economic Letters, 57*(3), 319-326.

Lusardi, A., & Mitchell, O. S. (2007a). Baby boomer retirement security: The roles of planning, financial literacy, and housing wealth. *Journal of Monetary Economics, 54*(1), 205-224.

Lusardi, A., & Mitchell, O. S. (2007b). Financial literacy and retirement preparedness: Evidence and implications for financial education. *Business Economics, 42*(1), 35-44.

Lynch, J. G., & Zauberman, G. (2007). Construing consumer decision making. *Journal of Consumer Psychology, 17*(2), 107-112.

Madrian, B. C., & Shea, D. F. (2001). The power of suggestion: Inertia in 401(k) participation and saving behavior. *Quarterly Journal of Economics, 116*(4), 1149-1187.

Ministry of Social Affairs and Employment (2012). Rapport pensioen in duidelijke taal (in Dutch). June 2012. Ministerie van Sociale Zaken en Werkgelegenheid, Den Haag.

Ministry of Social Affairs and Employment (2009). The old age pension system in the Netherlands. Publication No. SZW 74R610, Rijksoverheid, Den Haag.

Mitchell, O. S. & Moore, J. F. (1998). Can Americans afford to save? New evidence on retirement savings adequacy. *Journal of Risk and Insurance, 65*(3), 371-400.

Moe, W. W. (2003). Buying, searching, or browsing: Differentiating between online shoppers using in-store navigational clickstream. *Journal of Consumer Psychology, 13*(1&2), 29-39.

Montalto, C. P., Yuh, Y., & Hanna, S. (2000). Determinants of planned retirement age. *Financial Services Review, 9*(1), 1-15.

Moorthy, S., Ratchford, B. T., & Talukdar, D. (1997). Consumer information search revisited: Theory and empirical analysis. *Journal of Consumer Research, 23*(4), 263-277.

Munnell, A. H., Webb, A., & Hou, W. (2014). How much should people save? *Issue in Brief* 14-11 (July 2014). Chestnut Hill, MA: Center for Retirement Research at Boston College.

Nell, L. & Lentz, L. (2013). Pensioenorganisaties en communicatiewetgeving. Exploratief onderzoek naar keuzes en verplichtingen. *Netspar NEA Papers, 49*.

OECD, Organisation for Economic Co-operation and Development (2006). *Live longer, work longer*. Paris: OECD Publishing.

Osman, M. (2010). Controlling uncertainty: A review of human behavior in complex dynamic environments. *Psychological Bulletin, 136*(1), 65-86.

Palumbo, M. G. (1999). Uncertain medical expenses and precautionary saving near the end of the life cycle. *Review of Economic Studies, 66*(2), 395-421.

Pennington, G. L. & Roese, N. J. (2003). Regulatory focus and temporal distance. *Journal of Experimental Social Psychology, 39*(6), 563-576.

Pronin, E., & Ross, L. (2006). Temporal differences in trait self-ascription: When the self is seen as an other. *Journal of Personality and Social Psychology, 90*(2), 197–209.

Punj, G. N., & Staelin, R. (1983). A model of consumer information search behavior for new automobiles. *Journal of Consumer Research, 9*(4), 366-380.

Read, D. (2004). Intertemporal Choice. In D. J. Koehler & N. Harvey (Eds.), *Blackwell handbook of judgment and decision making* (pp. 424–443). Oxford UK, Blackwell.

Rhodes, S. R. (1983). Age-related differences in work attitude and behavior: A review and conceptual analysis. *Psychological Bulletin, 93*(2), 328-367.

Schalk, R., Van Veldhoven, M., de Lange, A. H., De Witte, H., Kraus, K., Stamov-Rossnagel, C., *et al*. (2010). Moving European research on work and aging forward: Overview and agenda. *European Journal of Work and Organizational Psychology, 19*(1), 76-101.

Scholz, J. K., Seshadri, A., & Khitatrakun, S. (2006). Are Americans saving "optimally" for retirement. *Journal of Political Economy, 114*(4), 607-643.

Skinner, J. (2007). Are you sure you're saving enough for retirement? *Journal of Economic Perspectives, 21*(3), 59-80.

Slovic, P. (1995). The construction of preference. *American Psychologist, 50*(5), 364-371.

Statistics Netherlands (2014). Average retirement age employees further up to nearly 64 years. January 16 2014.

Statistics Netherlands (2016). *Nederland langs de Europese meetlat 2016 (The Netherlands on the European scale 2016)*. The Hague/Heerlen/Bonaire, January 2016.

Stawski, R. S., Hershey, D. A., & Jacobs-Lawson, J. M. (2007). Goal clarity and financial planning activities as determinants of retirement savings contributions. *International Journal of Aging and Human Development, 64*(1), 13-32.

Taylor, M. A., & Shore, L. M. F. (1995). Predictors of planned retirement age: An application of Beehr's model. *Psychology and Aging, 10*(1), 76-83.

Thaler, R. H., & Benartzi, S. (2004). Save more tomorrow™: Using behavioral economics to increase employee saving. *Journal of Political Economy, 112*(S1), S164-S187.

Thaler, R. H., & Sunstein, C. R. (2003). Libertarian paternalism. *The American Economic Review, 93*(2), 175-179.

The Actuary (2014). Raising the real retirement age. May 8 2014.

Trope, Y., & Liberman, N. (2003). Temporal construal. *Psychological Review, 110*(3), 403-421.

Trope, Y., & Liberman, N. (2010). Construal-level theory of psychological distance. *Psychological Review, 117*(2), 440-463.

Trope, Y., Liberman, N., & Wakslak, C. (2007). Construal levels and psychological distance: Effects on representation, prediction, evaluation, and behavior. *Journal of Consumer Psychology, 17*(2), 83-95.

Tversky, A., & Shafir, E. (1992). Choice under conflict: The dynamics of deferred decision. *Psychological Science, 3*(6), 358-361.

Urban, G. L., Hauser, J. R., Qualls, W. J., Weinberg, B. D., Bohlmann, J. D., & Chicos, R. A. (1997). Information acceleration: Validation and lessons from the field. *Journal of Marketing Research, 34*(1), 143-153.

Urbany, J. E., Dickson, P. R., & Wilkie, W. L. (1989). Buyer uncertainty and information search. *Journal of Consumer Research, 16*(2), 208-215.

US Census Bureau (2012). US Census bureau projections show a slower growing, older, more diverse nation a half century from now. December 12 2012.

Vallacher, R. R., & Wegner, D. M. (1989). Levels of personal agency: Individual variation in action identification. *Journal of Personality and Social Psychology, 57*(4), 660-671.

Van Dam, K., Van der Vorst, J. D. M., & Van der Heijden, B. I. J. M. (2009). Employees' intentions to retire early. A case of planned behavior and anticipated work conditions. *Journal of Career Development, 35*(3), 265-289.

Van Oorschot, W. (2007). Narrowing pathways to early retirement in the Netherlands. *Journal of Poverty and Social Justice, 15*(3), 247–255.

Van Rooij, M. C. J., Lusardi, A., & Alessie, R. J. M. (2011). Financial literacy and retirement planning in the Netherlands. *Journal of Economic Psychology, 32*(4), 593-608.

Van Schie, R. J. G., Dellaert, B. G. C., & Donkers, B. (2016). Save more or retire later? Retirement planning heterogeneity and perceptions of savings adequacy and income constraints. *Netspar Industry Series, design 60*.

Van Schie, R. J. G., Dellaert, B. G. C., & Donkers, B. (2015). Promoting later planned retirement: Construal level intervention impact reverses with age. *Journal of Economic Psychology, 50*, 124-131.

Van Schie, R. J. G., Dellaert, B. G. C., & Donkers, B. (2013). Promoting later planned retirement: The differential impact of construal level interventions for younger and older individuals. *Netspar Discussion Papers, DP 06/2016-076*.

Van Schie, R. J. G., Donkers, B., & Dellaert, B. G. C. (2012). Savings adequacy uncertainty: Driver or obstacle to increased pension contributions. *Journal of Economic Psychology, 33*(4), 882-896.

Van Schie, R. J. G., Donkers, B., & Dellaert, B. G. C. (2011). Savings adequacy uncertainty: Driver or obstacle to increase pension contributions? *Netspar Discussion Papers, DP 11/2011-099*.

VanDerhei, J., & Copeland, C. (2010). The EBRI retirement readiness rating:™ Retirement income preparation and future prospects. *Employee Benefit Research Institute Issue Brief*, no. 344 (July).

Verplanken, B., & Holland, R. W. (2002). Motivated decision making: effects of activation and self-centrality of values on choices and behavior. *Journal of Personality and Social Psychology, 82*(3), 434-447.

Wakslak, C. J., Trope, Y., Liberman, N., & Alony, R. (2006). Seeing the forest when entry is unlikely: Probability and the mental representation of events. *Journal of Experimental Psychology: General, 135*(4), 641-653.

Wang, M. & Shi, J. (2014). Psychological research on retirement. *Annual Review of Psychology, 65*, 209-233.

Wang, M., & Shultz, K. S. (2010). Employee retirement: A review and recommendations for future investigation. *Journal of Management, 36*(1), 172-206.

Wang, M., Zhan, Y., Liu, S., & Shultz, K. S. (2008). Antecedents of bridge employment: A longitudinal investigation. *Journal of Applied Psychology, 93*(4), 818-830.

White, K., MacDonnell, R., & Dahl, D. W. (2011). It's the mind-set that matters: The role of construal level and message framing in influencing consumer efficacy and conservation behaviors. *Journal of Marketing Research, 48*(3), 472-485.

Wiener, J. & Doescher, T. (2008). A framework for promoting retirement savings. *The Journal of Consumer Affairs, 42*(2), 137-164.

Wijzer in geldzaken, the Money-Wise Guide (2014). *Pensioenmonitor 2014 (Pension monitor 2014)* (in Dutch).

Wijzer in Geldzaken, the Money-Wise Guide (2011). *Zorgen over het pensioeninkomen (Worries about pension income)* (in Dutch).

Yuh, Y., Montalto, C. P., & Hanna, S. (1998). Are Americans prepared for retirement? *Financial Counseling and Planning, 9*(1), 1-13.

Zaida, A. (2012). Population aging and financial and social sustainability challenges of pension systems in Europe: A cross-national perspective. In: L. Bovenberg, C. van Ewijk, & E. Westerhout (Eds.), *The future of multi-pillar pensions* (pp. 17-45). Cambridge, UK: Cambridge University Press.

Zappalà, S., Depolo, M., Fraccaroli, F., Guglielmi, D., & Sarchielli, G. (2008). Postponing job retirement? Psychosocial influences on the preference for early or late retirement. *Career Development International, 13*(2), 150-167.

Summary (English)

In many developed countries collective pension plans are under pressure. As a consequence, individuals face a shift in responsibility for retirement planning from a collective level towards the individuals themselves. The increased importance of individual retirement planning calls for more research that addresses the (psychological) processes underlying individuals' tendencies to plan for retirement. In this dissertation we do so by exploring individuals' drivers to consider two important strategies in planning for an adequate retirement: Save more or retire later.

In the first essay we study the effect of uncertainty surrounding one's savings adequacy on retirement savings and information search intentions. Deciding how much to save for retirement is a difficult task that includes many uncertainties. Because previous research in psychology and economics provides opposing predictions regarding the impact of uncertainty on retirement savings contributions, we develop a conceptual model that accounts for both effects. Our results indicate that the effect of uncertainty is moderated by two factors: an individual's perceived adequacy of current savings and that individual's financial constraints. In particular, we find that uncertainty increases retirement contributions for those who believe that they save adequately; however, it hinders retirement contributions for those who believe that they save inadequately. This effect of uncertainty is further moderated by the availability of financial means: a reduction in uncertainty results in greater contributions to savings only when financial constraints are absent. We also study the effects of uncertainty on information search, and find that uncertainty motivates individuals to search for information due to its effect on their intention to save, for which they engage in purchase-oriented information search (indirect effect), but that they also intend to search for information to directly reduce uncertainty (direct effect).

In the second essay we study individuals' planned retirement age, and explore age-related differences in representing this decision (in terms of which goal is primary to the decision) and the resulting differential impact of a construal level intervention on individuals' planned retirement age among different age groups. We argue that as individuals' temporal distance to retirement decreases, their primary retirement goal is likely to change. Younger individuals are primarily driven by desirability goals (preference for when to retire), but older individuals are primarily driven by feasibility goals (believe of how much one can save). Our results show that indeed a construal level intervention-induced global mindset increases the impact of desirability considerations on planned

retirement age for younger individuals (and lowers planned retirement age), but increases the impact of feasibility considerations for older individuals (and raises planned retirement age).

In the third essay we investigate the interrelation among the two main strategies that individuals can follow in response to an anticipated lack of pension savings, that is to save more or retire later. Most previous research has investigated individuals' intentions to use one of these strategies separately. We find that lower perceived savings adequacy increases individuals' savings intentions, but that depending on the level of individuals' perceived current income constraints they either form stronger intentions to save more (if they perceive weak income constraints) or to retire later (if they perceive strong constraints). We provide further evidence for these findings by analysing the retirement plans of two groups in our sample that are at risk of not saving enough for retirement. As expected we find that these groups respond differently to an anticipated lack of retirement savings.

Overall, the results of this dissertation provide more insight in individual differences in retirement planning and give directions for policy makers to customize their pension communications accordingly.

Samenvatting (Nederlands)

In veel ontwikkelde landen staan de collectieve pensioenaanspraken onder druk. Als gevolg hiervan verschuift de verantwoordelijkheid voor pensioenplanning steeds meer van een collectief niveau naar het niveau van de individu zelf. Doordat het daarom steeds belangrijker wordt dat individuen zelf gaan zorgdragen voor hun pensioenplanning, is onderzoek nodig naar de (psychologische) processen die ten grondslag liggen aan de wijze waarop zij voor hun pensioen plannen. In dit proefschrift doen we dat door te verkennen wat individuen motiveert om twee belangrijke planningsstrategieën te gebruiken om voor een adequaat pensioen te zorgen: Meer sparen of later met pensioen gaan.

In het eerste essay onderzoeken we het effect van de onzekerheid rondom de toereikendheid van het pensioensparen op de intenties van mensen om meer te gaan sparen en informatie over het pensioen te zoeken. Het bepalen van de toereikendheid van het pensioen is een moeilijke taak die veel onzekerheid omvat. Omdat eerder onderzoek in het veld van de economie en de psychologie leidt tot tegenovergestelde verwachtingen voor het effect van onzekerheid op pensioensparen, hebben we een conceptueel opgesteld waarin beide effecten worden meegenomen. Onze resultaten geven aan dat het effect van onzekerheid afhankelijk is van twee factoren: de verwachte toereikendheid van de huidige pensioenopbouw en de beperkingen in de financiële middelen van een individu. Meer specifiek vinden we dat onzekerheid de spaarintentie verhoogt voor degenen die denken dat hun pensioenopbouw voldoende is, terwijl het de spaarintentie verlaagt voor degenen die denken dat hun pensioenopbouw onvoldoende is. Dit effect van onzekerheid is verder afhankelijk van de beschikbaarheid van financiële middelen: een afname in onzekerheid resulteert alleen in een hogere spaarintentie wanneer er geen beperkingen zijn in de beschikbare financiële middelen. We hebben ook de effecten van onzekerheid op informatie zoeken bestudeerd. We vinden dat onzekerheid ertoe leidt dat mensen enerzijds informatie zoeken omdat het een effect heeft op hun spaarintentie, waarvoor ze zoeken naar aankoop gerelateerde informatie (indirect effect), maar dat mensen daarnaast ook informatie zoeken om de onzekerheid direct te reduceren (direct effect).

In het tweede essay bestuderen we de geplande pensioenleeftijd van mensen en verkennen we de leeftijdsafhankelijke verschillen in de mentale representatie van deze beslissing (voor wat betreft welk doel van primaire betekenis is in de beslissing) en daaruit voortkomend dat een ‘construal-level’ interventie een ander effect heeft op de geplande pensioenleeftijd van verschillende leeftijdsgroepen. We beargumenteren dat wanneer de tijdsafstand van een individu tot aan pensionering kleiner wordt, het primaire doel voor het

pensioen in deze beslissing verandert. Jongere mensen worden primair gedreven door wenselijkheidsdoelen (preferentie voor wanneer je met pensioen wilt gaan), terwijl oudere mensen vooral worden gedreven door haalbaarheidsdoelen (hoeveel kan men nog sparen voor een comfortabel pensioen). In lijn hiermee tonen onze resultaten aan dat een 'construal-level' interventie die een globaal denken teweeg brengt, de invloed van wenselijkheidsoverwegingen op de geplande pensioenleeftijd vergroot voor jongere mensen (en daardoor de geplande pensioenleeftijd verlaagt), terwijl het de invloed van haalbaarheidsoverwegingen vergroot voor oudere mensen (en daardoor de geplande pensioenleeftijd verhoogt).

In het derde essay onderzoeken we de relatie tussen de twee belangrijkste strategieën die mensen kunnen volgen als reactie op een verwacht pensioentekort: meer sparen of later met pensioen gaan. Eerdere onderzoeken hebben deze strategieën meestal als zijnde afzonderlijke strategieën onderzocht. We tonen aan dat een verwacht tekort leidt tot een grotere spaarintentie, maar dat afhankelijk van of mensen op dit moment beperkt kunnen rondkomen of niet, zij een hogere intentie hebben om meer te gaan sparen (als zij een kleine beperking ervaren) of een hogere intentie hebben om later met pensioen te gaan (als zij een grote beperking ervaren). Deze bevindingen worden verder verdiept door twee groepen te analyseren die het risico lopen op een pensioentekort. Zoals verwacht vinden we dat deze groepen anders reageren op een verwacht pensioentekort.

Concluderend kan gesteld worden dat de resultaten van dit proefschrift meer inzicht geven in de verschillen in pensioenplanning tussen individuen en geven ze beleidsmakers meer inzicht hoe ze daar met pensioencommunicatie op kunnen inspelen.

About the author

Ron van Schie (Nootdorp, March 12th, 1984) obtained his Master's degree in Economics in 2007 from the Erasmus University Rotterdam. In January 2008 he started as a PhD candidate in the department of marketing at the Erasmus School of Economics (ESE). He presented his work at several conferences (Netspar Pension Day, theme conferences and working groups). His work has been published in the Journal of Economic Psychology and appeared in the Netspar Discussion series. Since 2012 he is working as a statistical researcher at Statistics Netherlands, where he manages several (international) projects related to price and real estate statistics.

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Publications

Publications in journals

Van Schie, R.J.G., Dellaert, B.G.C., & Donkers, B. (2015). Promoting later planned retirement: Construal level intervention impact reverses with age. *Journal of Economic Psychology*, *50*, 124-131.

Van Schie, R.J.G., Donkers, B., & Dellaert, B.G.C. (2012). Savings adequacy uncertainty: Driver or obstacle to increased pension contributions? *Journal of Economic Psychology, 33*(4), 882-896.

Articles in Netspar series

Van Schie, R.J.G., Dellaert, B.G.C., & Donkers, B. (2016). Save more or retire later? Retirement planning heterogeneity and perceptions of savings adequacy and income constraints. *Netspar Industry Series, design 60*.

Van Schie, R.J.G., Dellaert, B.G.C., & Donkers, B. (2013). Promoting later planned retirement: The differential impact of construal level interventions for younger and older individuals. *Netspar Discussion Papers, DP 06/2013-076*.

Van Schie, R.J.G., Donkers, B., & Dellaert, B.G.C. (2011). Savings adequacy uncertainty: Driver or obstacle to increase pension contributions? *Netspar Discussion Papers, DP 11/2011-099*.

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Dissertations in the last five years

Abbink, E.J., *Crew Management in Passenger Rail Transport*, Promotors: Prof. L.G. Kroon & Prof. A.P.M. Wagelmans, EPS-2014-325-LIS, http://repub.eur.nl/pub/76927

Acar, O.A., *Crowdsourcing for Innovation: Unpacking Motivational, Knowledge and Relational Mechanisms of Innovative Behavior in Crowdsourcing Platforms*, Promotor: Prof. J.C.M. van den Ende, EPS-2014-321-LIS, http://repub.eur.nl/pub/76076

Akemu, O., *Corporate Responses to Social Issues: Essays in Social Entrepreneurship and Corporate Social Responsibility*, Promotors: Prof. G.M. Whiteman & Dr S.P. Kennedy, EPS-2017-392-ORG, https://repub.eur.nl/pub/95768

Akin Ates, M., *Purchasing and Supply Management at the Purchase Category Level: Strategy, structure and performance*, Promotors: Prof. J.Y.F. Wynstra & Dr E.M. van Raaij, EPS-2014-300-LIS, http://repub.eur.nl/pub/50283

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In many developed countries collective pension plans are under pressure. As a consequence, individuals face a shift in responsibility for retirement planning from a collective level towards the individuals themselves. The increased importance of individual retirement planning calls for more research that addresses the (psychological) processes underlying individuals' tendencies to plan for retirement. In this dissertation we do so by exploring individuals' drivers to consider two important strategies in planning for an adequate retirement: Save more or retire later. In the first essay we combine insights from research in economics and psychology to investigate what drives individuals to consider additional savings contributions. In particular, a conceptual model is developed to explain the role of uncertainty regarding one's savings adequacy therein. In the second essay we study individuals' planned retirement age, and explore age-related differences in representing this decision (in terms of which goal is primary to the decision) and the resulting differential impact of a construal level intervention on individuals' planned retirement age for different age groups. In the last essay we take into account both strategies simultaneously and explore the interrelation among individuals' intentions to consider additional savings and when to retire. Our findings also have practical implications as they provide more insight in individual differences in retirement planning and give directions for practitioners to customize their pension communications accordingly.

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